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VOL. LI.

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THE
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Contract Reporter.

A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING,

AND

BUILDING.

"It aims at Eternity; and therefore is the only thing incapable of modes and fashions in its principles, which are founded upon the experience of all ages, promoted by the vast treasures of all the Great Monarchs, and skill of the greatest Artists and Geometricians, every one emulating each other; and experiments in this kind, being greatly expensive and errors incorrigible, is the reason that the principles of Architecture are now rather the study of antiquity than fancy."—SIR CHRISTOPHER WREN.

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THE ARCHITECT AND CONTRACT REPORTER. A JOURNAL OF ART, CIVIL ENGINEERING & BUILDING.

THE WEEK.

THE opening of the Manchester Ship Canal on Monday is an event which affects not only Lancashire and England, but the world in general, for as long as cotton is in universal use the increase of facilities for its manufacture is not a local affair. At the same time, the credit for overcoming the difficulties cannot be diffused. It was mainly through the courage of Manchester men the work was accomplished. As a canal seems, according to the popular notion, to be little more than a very long and very wide ditch, the obstacles which had to be overcome are not likely to be sufficiently recognised. In the first place, it was necessary to fight a Parliamentary battle that was almost unprecedented in bitterness against the representatives of rival interests. There was also a prejudice against canals which largely diminished the financial support. Then when the preliminary contests were gained and the contracts were let to Mr. WALKER, who was supposed to be the most competent contractor in the country for such an undertaking, his early and unexpected death not only gave rise to litigation but brought about disorganisation. Next came a financial crisis which must have been fatal to the enterprise if the responsibility for completing the canal had not been assumed by the Corporation of Manchester. That body and the shareholders who loyally upheld the directorate in a most arduous business may well share in the triumphal result which was witnessed on Monday.

EVERY visitor to Scarborough will remember the difficulty of communication between the north and south shores, and may have heard of various proposals for overcoming them. Steps have been at length taken to obtain an Act authorising the construction of a tunnel for carriages and foot passengers. It will start on the south side at the Foreshore Road, at a point about 12 yards east of the steps leading from that road to Merchants Row, and will proceed underground in a straight line in a northerly direction, terminating on the Royal Albert Drive, on the North Bay, at a point 100 yards west of the most easterly steps leading on to the beach. Up and down roadways and footways, ventilating shafts, offices, toll-houses and other buildings and shops will be constructed. There is a proviso that gunpowder or other explosives shall not be used in the course of construction without the consent of the corporation. The capital of the company which is incorporated by the Bill is fixed at 30,000*l.*, in shares of 10*l.* each, with power to borrow on mortgage 10,000*l.*, and the income will be derived from tolls, the maximum powers of the company in regard to which are as follows:—For foot-passengers, 2*d.*; for bicyclists, 3*d.*; for omnibuses, carriages, carts, or vans drawn by two horses, 6*d.*, drawn by one horse, 4*d.*; for horses not drawing, 3*d.*; and for every case, bag, or other package not conveyed by cart, except personal luggage conveyed by hand, and not exceeding 28*lbs.* in weight, 2*d.*. Double tolls may be charged by the company between 11 P.M. and 5 A.M. If in the execution of the works it is found necessary, to avoid injury, to underpin or otherwise strengthen houses and buildings within 100 feet

of the tunnel, the company may be required to do so by the owners or lessees. The time fixed for the completion of the works is five years.

ONE of the cases heard in the Queen's Bench Division prior to the holidays related to an arbitration case. Messrs. CUTTING & SON, builders, sued Mr. ARTHUR LOWE, of Saxmundham, to recover 435*l.* 8*s.* for material supplied and work done. Defendant denied his indebtedness, disputed various items of the account rendered, and set up a counter-claim for 42*l.* 12*s.* 10*d.* for breach of contract in failing to complete the work in time. The whole matter in dispute was referred to arbitration, Mr. COCKEREL and Mr. FIELD being appointed arbitrators, with power to select an umpire. They selected as umpire Mr. GRIMWOOD, who made his award to the effect that Mr. LOWE pay to the plaintiffs 115*l.* 2*s.* 8*d.* in addition to 185*l.* which he had already paid into Court, and two-thirds of the costs of the arbitration, the plaintiffs paying the other third. Counsel for the defendant applied to the Court to set aside, or refer back, the award to the arbitrator on the grounds that material evidence had not been heard, and that one of the questions referred had not been adjudicated upon in the award. The defendant swore he was never asked to produce an agreement between himself and the plaintiffs, which was material to his counter-claim, that the books of the plaintiffs were examined in his absence and without notice to him, and that whilst witnesses were called on the plaintiffs' behalf, none were called on his (defendant's) side. Counsel for plaintiffs said that Mr. FIELD was asked to attend when the plaintiffs' books were examined, but he did not do so, nor did he, as the umpire stated in his affidavit, produce the agreement referred to in support of the defendant's counter-claim, though asked to do so several times. The umpire also stated that he took the counter-claim fully into consideration in making his award. If Mr. FIELD did not choose to attend the examination of the books, and now did not choose to make an affidavit, that was no reason why the award should be sent back. The court dismissed the application with costs.

THE Salon, in the Champ de Mars, was exceptionally successful in 1893, as the total receipts exceeded the average of the preceding years to the extent of 10,000 francs. As the finances are encouraging, there is not much likelihood that the schism between the two societies will be closed. The International Exhibition of 1900, which will be held in the Champ de Mars, will not, as was anticipated, interfere with the artists' buildings; it is not unlikely that the Society will receive an impetus from the gigantic exhibition. At first the committee of the new Salon were not eager to display architectural drawings, for it was too well known they were used as screens by young people in the Champs Elysées, and entries in the catalogue were found to serve architects as well for advertisement purposes without a display of drawings. Subsequently a few drawings were admitted to the corridors and landings, and at the general meeting, which was held on Friday, an architect, M. DE BAUDOT, was elected a member of the committee.

NOTES ON THE NORMAN ARCHITECTURE OF WINCHESTER CATHEDRAL.

By CHARLES LYNAM.

VERY varied indeed must be the impressions of those who visit for the first time the immense pile of building known as Winchester Cathedral, placed as it is for the most part on a flat green sward and surrounded by trees of many years' growth, and accompanied by remains of former buildings which formed part of the original great *ensemble* of church and monastery, but are now superseded for the most part by the houses of the clergy of the present day. To some the great building may at first sight appear rather as a work of nature than of man. Varied in its outline as a great rock with massive projections, sloping sides, flat ledges, rising pinnacles and cavernous recesses all clothed in quiet grey, touched here and there with bright lights and radiant colours, toned as are the eternal hills by centuries of time and their attendant effects, it is not till after strong effort has been made to bring the mind to actual realities that it is felt that this great mass originated in settled design, symmetrical in a way and for a defined and special purpose.

This effort made, the mind next demands who originated the work before us and when did its conception first take root? Presently the eye begins to scrutinise its general forms and details and at once its great dimensions, its breadth and simplicity, and its stately grouping begin to disclose themselves. After further observation the tutored mind discovers that it is not in the multiplied refinements of such parts as the west end nor in the great straight-lined windows of its flanks that its power abides, but in its vastness, its general breadth and massiveness of wall, and withal in the simple refinements of light and shade and form in its recessed arcades, of repeated shaft and arch, and in the enrichment of the horizontal lines and boldly projecting corbellings. These are the sources of the sum of the infinite pleasures which, inside and out, this church has given through the ages to the devotee, the architect and the artist. Aye, and, with truth it may be said, to the modern excursionist also.

To whom belongs in the greatest degree the merit of this signal service to so many people? To some minds the name of the great Bishop WILLIAM OF WYKEHAM will first arise. Others will recall Bishops GODFREY, LUCY, EDINGTON, FOX, &c. But to those who have carefully surveyed the earliest part of the crypt, the north and south transepts and the central tower, and have examined the walls of the whole body of the church, such names will not be accepted as having furnished the real greatness of the design of this mighty building. Herein acceptable record comes to the aid of the inquirer, for Dr. MILNER, in his "History of Winchester," states, on authority which he deems to be trustworthy, that "in 1079 WALKELIN, whose genius and whose heart were equally capacious, undertook the greatest work which ever yet has been achieved by a bishop of this see, that of rebuilding the cathedral and adjoining monastery from the ground at his own expense and in a noble style of architecture." Dr. MILNER also writes:—"In 1093 the new church being rendered fit for Divine service, and the conventual offices for the reception of the monks, almost all the bishops and abbots of England assembled in this city to honour the solemn dedication of them, which took place July 15, being the festival of St. SWITHIN, the patron saint of the place." Here, then, is a clear statement that from 1079 to 1093 Bishop WALKELIN built a new cathedral at Winchester, and elsewhere it is stated that "barely one hundred years had elapsed since this sacred edifice had been newly built by St. ETHELWOLD, and that 'the very next day' (after the consecration of Bishop WALKELIN's church) the workmen began to demolish the ancient fabric, leaving nothing standing at the end of the year except the high altar and one porch."

It is to be accepted, then, that during the latter years of WILLIAM THE CONQUEROR'S and the early years of his son's—WILLIAM RUFUS—reigns, a church was here built "from the ground," and the main purpose of these notes is to examine, as far as a brief study goes, in a practical way, how much of the church finished in A.D. 1093 still remains.

Certain portions of the building present the well-known characteristics of early Norman work, and others those of its later development. Authentic record again informs us that within a few years of its erection by WALKELIN the central tower fell, and was rebuilt forthwith and finished about the year 1136. What may have been the cause of this disaster to the newly-built tower must, in the absence of all record on the point, be matter of conjecture. The faithful, at the time of its fall, are said to have attributed it to the fact that the interment of the wicked King RUFUS in its midst invoked Divine vengeance. The present Dean has explained that the building is placed upon peaty ground, and that this may have occasioned the ruin of WALKELIN'S tower. In these circumstances we learn that between 1079 and 1136 there was again a complete church of Norman character. East of the "crossing" the only remains now existing of this date are the lower part of a great shaft, which formed part of the original apse, now to be seen in Bishop GARDINER'S chantry, and fragments at the west end of the choir. But the crypt beneath the choir exists in its entirety, as do the central tower, the north and south transepts, the slype next the south transept (now used as a carriage-way), and the western front of the chapter-house. The crypt consists of a nave and aisles with apsidal east end, and has circular piers along its centre line. The north and south transepts have a nave with surrounding aisles on three sides—east, west and north. At the east end of the nave there are remains of its early arcade. The west front of the nave is of comparatively recent date, but it may be said that the aisle walls and the piers of the nave are more or less of Norman origin. In fact, their exceptional character is created by their Norman core. It is related that Bishop WALKELIN outwitted his cousin, the CONQUEROR, in the matter of securing timber for his buildings, by straining to the utmost a permission of the King that he might cut down trees in a neighbouring wood within a limited time, and that he employed all the labour he could command and wholly cleared the wood within the given time, much to the chagrin of the CONQUEROR, who however forgave the act on the Bishop's penitent petition. It is said that this timber was used in the fabric, and therefore it is a question whether any, and if so, how much, of WALKELIN'S timber roofing now remains. The observations on which these notes are founded did not go far enough to warrant any conclusion on this point. The scantlings of the present ancient timbers are of enormous size, and the framing generally consists of what is known as the framed rafter truss. These trusses consist of rafters, collars, cross diagonal braces, wall hammers and struts; their scantlings are about 10 inches by 10 inches; the framing is secured by oak pegs, and they are placed at 22 inches apart. There have been considerable repairs made to them from time to time, and now iron straps and bolts are frequent. To the nave roof there are massive tie beams a few inches above the summit of Bishop WILLIAM OF WYKEHAM'S vaulting. (No. 11.)



SKETCH No. 14.

The arrangement of plan in the transepts and the consequent treatment of this part of the building, both inside and outside, is the most remarkable feature in the whole structure, and it is unique in this country, there being no other cathedral where an aisle follows the gable ends as well as both the flanks of the transepts. This treatment gives to the interior of Winchester a superiority of design over every other in this particular. It is one thing to decorate a wall with what Mr. RUSKIN designates "a veil" of shaft and arcade, and another to gain the advantage of the recess of an aisle with its isolated piers and arch and vault. The contrast may be noticed by comparing this part of the cathedral

with that of Durham (No. 14) and St. Albans (No. 15). It cannot but be seen that the special feature here dwelt upon gives a more Romanesque character to this design, which is also evidenced by the lowness of the arcade that prevails here, and is to be seen also at Peterborough, Southwell and elsewhere.

The ambitious desire for height soon developed itself, and its gradual growth is seen at Romsey Abbey Church (No. 16), Christ Church, Oxford, the nave of Gloucester, and at the Abbey Church of Tewkesbury. The original idea started with a pier formed, as it were, as a piece of wall; then this changed into a circular or octagonal shaft, but cautiously strengthened, as at Oxford and Romsey (shown in No. 16); and lastly we have an isolated high shaft, as at Tewkesbury and Gloucester.



SKETCH No. 15.



SKETCH No. 16.

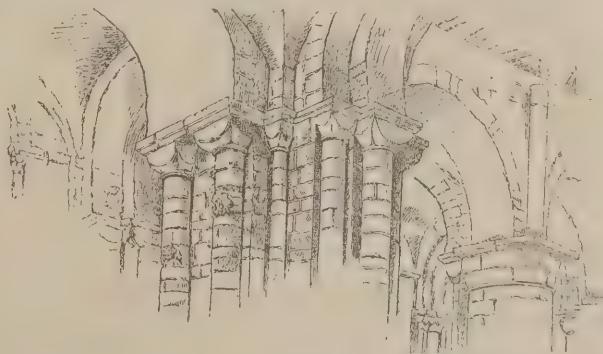
can hardly be said to be of ashlar-work, as they have not been smoothed by a tool, and the joints of the wall stones, both vertical and on the bed, are left rough, which in a great measure accounts for the broad mortar-joint. In the apse of the crypt the original wall has been pierced, and there it may be seen that the core is of flint rubble, with a large proportion of mortar. It may, perhaps, be assumed that the walls generally are built after the same fashion. The mortar is seen to be formed of gravel, sand and lime, and its present hardness is very remarkable, for even in the outside joints, where not covered by modern pointing, it may be seen to be harder than the stone, and not weathered in the least. The broad joints of the masonry are not confined to the

walling, but are used even where there are mouldings and enrichments.

The external horizontal strings and arches are the only parts which are enriched; of these examples are shown in No. 3. Internally there is almost an entire absence of these decorative features. They consist mostly of the billet mould, either single or double, and notchings of various forms. The capitals to shafts are of the simplest cushion form, but it is noteworthy that the abacus has a bead on the lower edge of its upper member, which gives to it a richness of moulding not observable elsewhere. The simple treatment of the capitals to the central piers in the crypt takes almost a Romanesque form, though perfectly explainable from the combination of the circular shaft and square springer. The same kind of capital recurs in the central circular shafts at the ends of the transept. The bases to shafts and piers vary in form considerably; those in the crypt spread at the foot more than those in the transepts, but all are of the simplest contour. The piers are masses of wall with central shafts to receive the arches of soffits, and nook shafts beneath the outer edge of the outer order of the arches. Of mouldings, except as strings and imposts, there are none. The architectural effect depends entirely upon arcadings of varying proportions, the massiveness of the walls always lending its aid to the result. In the flanking arcades of the transepts there is a strong peculiarity in the form of the arches, which are of the horse-shoe shape. It is a matter of speculation whether this was adopted for the sake of the form itself or with the idea of getting the arch opening as large as possible; in any case, and whether intentional or not, this increase of the width of arch over that of the piers is very effective.

In the wall of the south aisle there is a blocked-up doorway which originally formed an entrance from the north walk of the cloister, and on the west side of this doorway is preserved a fragment consisting of the impost mould and the springers of the arch, which have all the characteristics of the early Norman work (No. 18). The position of this bit of early work is extremely interesting, and its present existence is not to be noted without an expression of gratitude to those who have so long preserved it.

The precise lines of junction between the early and later Norman work are easily discernible after careful inspection; they occur, of course, in the vicinity of the central tower,



SKETCH No. 17.

and are to be seen both inside and outside the building. This feature and other details may perhaps be best explained by reference to the illustrations accompanying this paper.



SKETCH No. 2.

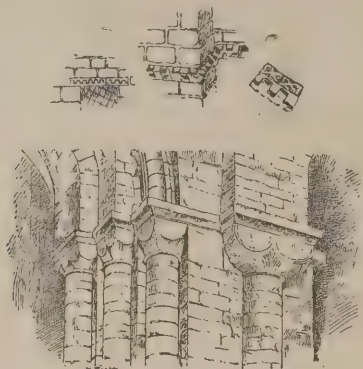
north transept (next the entrance to crypt) is shown; it is also of the earlier period, and from it will be noticed the simplicity of the treatment of this feature. It shows the

Sketch No. 1 is of the north-west pier of the north transept, showing its capitals of the single "cushion" form and springers of the arches and broad-jointed masonry, characteristics of the early work.

In sketch No. 2 the base of the southern pier in the

broad spreading square base as a foundation beneath the whole pier, the square lower member to the various shafts, and the shallow mouldings of the bases to the shafts.

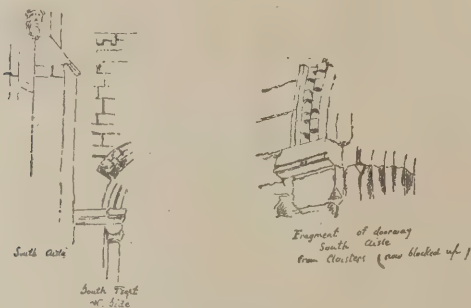
Sketch No. 3 shows the variations in the capitals between the two periods, in contrast with sketch No. 1. In No. 3 the broad joint is substituted by a fine one, and



SKETCH No. 3.

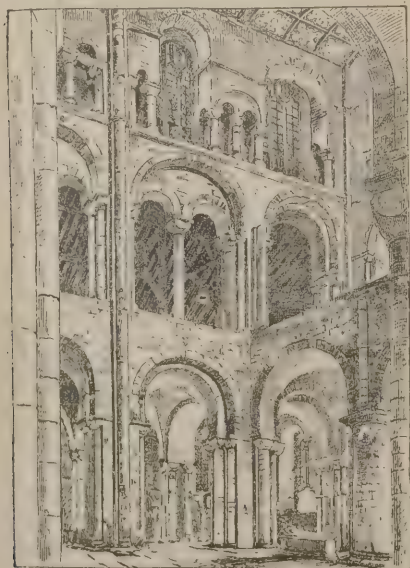
the masonry itself is smooth by tooling and more regular; the division in the cushion capital is seen in the shaft to the soffit arch, and the edge of the main arch is boldly moulded instead of being left sharp as in sketch No. 1. Here also is to be seen perhaps the first bit of original carving executed in the whole of the cathedral, in the scrap of foliage filling the lower space of the divided cushion of the capital. Nowhere else does even as much as this fragment of the carver's chisel appear in any part of the building, till this piece of the reconstruction after the fall of the tower was put up. It will be noticed also that the section of the abacus mould has been altered by the omission of the bead between the upper and lower member, which is always present in the earlier work.

The junction on the outside between the early work of the west side of the south transept and WILLIAM OF WYKEHAM's south aisle is very clearly marked, and is roughly



SKETCH No. 18.

indicated in sketch No. 18, where the masonry of the early and late periods is clearly distinguishable.

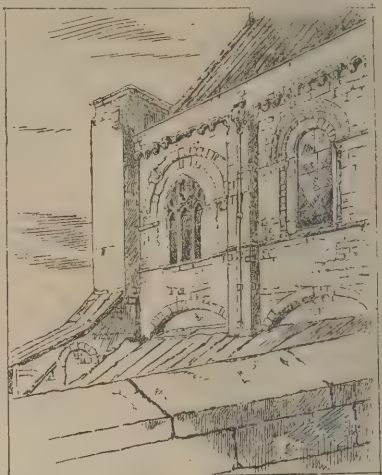


SKETCH No. 5.

There are various evidences of deviation from first intentions as to design in several parts of the building. In the interior this is apparent in No. 5, in the north transept looking north, where the abrupt termination of the wall shafts above the face of the end arcade points to a decided case of this kind. It may be that the desire for the effective arcade treatment in the pier between the clere-

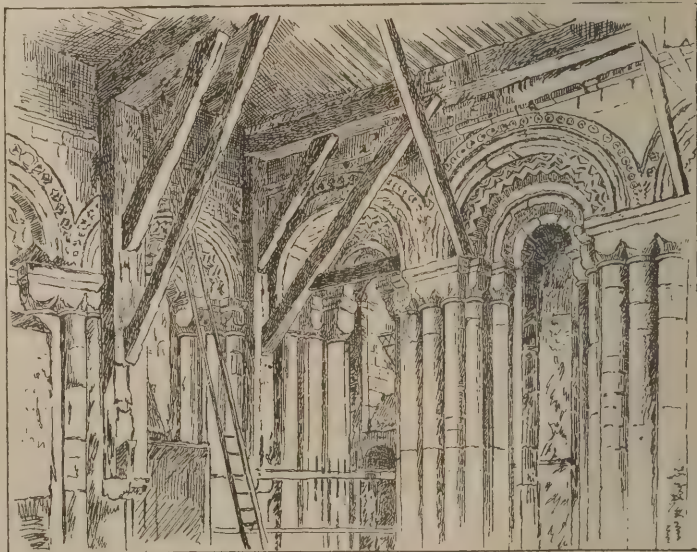
story windows governed this alteration, as it could not have been carried out if the design below had been followed.

The exterior, No. 4, showing part of the east side of the south transept, discloses a very material deviation in design. The southern bay of this flank is altogether different from the others, and in itself the existing arches indicate a material change of purpose in the designer. This bay would appear to be of the same date as its immediate neighbour northwards, the characteristics of which conform to those of the earlier period generally, but the difference of treatment is very decided. Architecturally the northern bays are a great improvement on this southern bay. In considering the differences in this place it should, however, always be borne in mind that it was the constant habit of the Norman builders to add mouldings and carvings to plain constructive members from time to time. No. 4 also shows that the original roof of the eastern chapels of this transept rose to the underside of the string-course below the clerestory windows, and followed the raking line now defined by the weathering in the south wall. The arches above the present roof belong to the ground floor arcades of the transept. To which period the corbel tabling belongs is an interesting question. If it may be assigned to the earlier work (which is probable), it is the earliest feature in which carving was introduced, and in that case it was not left for the later Norman builders to introduce the carver's art, as previously suggested.



SKETCH No. 4.

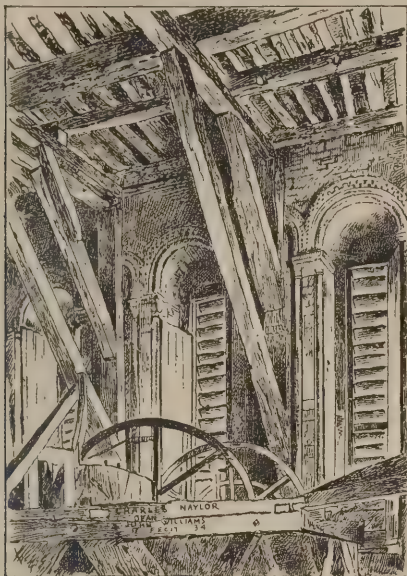
No. 6 is a corner of the present ringing-room, which originally formed a lantern, seen from the inside of the church, and shows the progress made in the details of the later work. Here the moulded chevron or zigzag is freely introduced, though not seen anywhere below this level, and the grouping of the shafts is very beautiful. This must have formed a charming storey, as seen from below. The exterior of these windows is also very artistically enriched, the shafts being pleasingly elaborated by a chevron treatment, while the grouping of the mouldings is delicately designed.



SKETCH No. 6.

No. 7 shows part of one side of the interior of the upper stage of the tower, and displays the true artistic feeling which prevailed throughout the Norman period. The walls are increasingly pierced by openings for the sake of lightness in the upper parts; the details, though simple in character, are, even in this remote part of the building, en-

riched to a considerable extent, as may be seen in the double billet moulding encircling all the arches of these many openings. The timbers here form the roof of the tower, from the top of which very pleasing views are seen on all sides :



SKETCH No. 7.

one towards St. Catherine's Hill, with its rampart of an early camp, is faintly indicated by No. 8, the College of WILLIAM OF WYKEHAM being in the foreground.



SKETCH No. 9.

No. 9 is a view of the crypt looking south-west, and shows the low central circular pillars with their square bases and abaci, and the radiating ribs meeting the form of the apse. Except in the mouldings of base and cap to circular pillars, and the slightly-projecting impost of the wall piers, all here is as simple as it could be, the groining being of rubble; but withal there is skilful design and construction throughout, showing that master minds governed the erection of the structure. Well that it was so, seeing how much depended upon it for support.



SKETCH No. 10.

with a dividing arcade, as seen in this sketch.

No. 11 shows the interior face of the upper part of the south wall of the nave, above the groining of WILLIAM OF WYKEHAM. In it is seen the original wall shaft of the early Norman nave, and hereby it is again evident that WILLIAM OF WYKE-



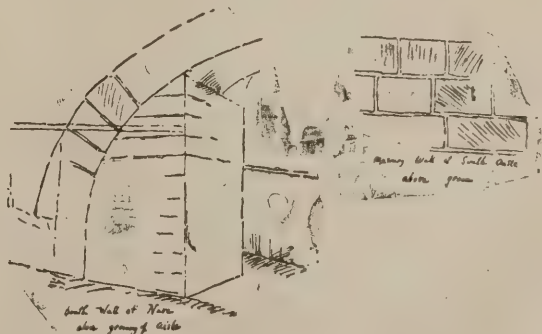
SKETCH No. 8.

HAM did not wholly take down the walls of the nave. On this sketch is also shown a bit of the masonry of the Norman work of the central tower from the north-west angle.



[SKETCH No. 11.]

No. 12 is taken from above the vaulting of the south aisle, showing the wide jointed masonry, the early tooling, and also the arch of the early triforium.

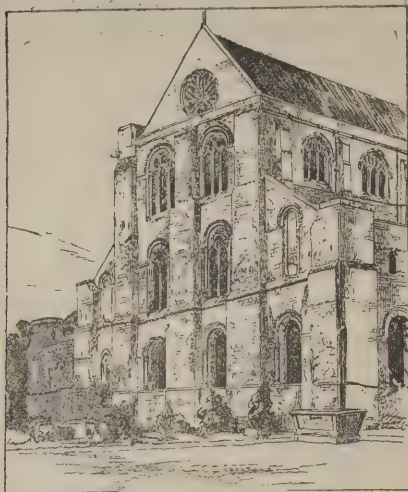


SKETCH No. 12.

No. 13 is a view of the gable of the north transept, showing its three heights of windows, the lower lighting the ground arcade, the middle corresponding with the triforium range, and the upper with the clerestory. The flank has the lower line of windows, as in the gable; the small one above lights the triforium, and the clerestory lights are insertions of Perpendicular date, as also is the central circular window in the gable. There is a stair turret at each of the extreme angles of the gable.

Though barely forming part of the subject of these notes, it would scarcely be possible to leave this cathedral without

some jotting of the remarkable font shown in No. 17. It is now placed on the north side of the nave, and the

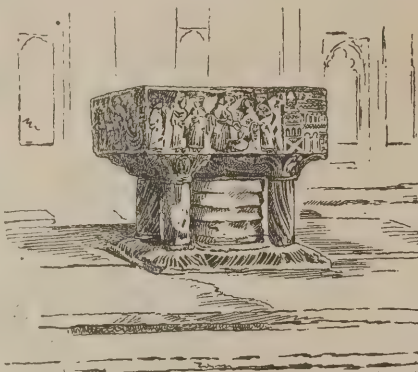


SKETCH No. 13.

present Dean assigns it to the date of about 1200, and exhaustively gives its history in a paper lately read before the British Archaeological Association at Winchester.

Norman architecture is nowadays regarded by most people as entirely a thing of the past, out of which nothing is to be turned to account for present use, and perhaps its main characteristics are too great for application in this generation; but it

own, and those who neglect to study it suffer an untold loss. It would be a charming undertaking to set forth with pen and pencil the wondrous things which the builders of this period accomplished in this country in a little more than a hundred years, and really to show how much of their extraordinary work still remains to us (though it has become the fashion erroneously to consider that Norman work is always ready at any moment to



SKETCH No. 17.

come down with a run). But what time has an architect with the responsibilities of a practice on his shoulders for these things? Except for a snatched holiday of short duration once a year, his every thought is necessarily of current business, not of past achievements; but who that has a soul for real building, when everything was genuinely of the best—real in purpose, art, construction, and labour—does not often yearn for a quiet hour amidst such work of the far-distant past as the Normans built in Winchester Cathedral?

GERMAN PAINTING.

WE have noticed some of the remarks on architecture in the last address of Sir FREDERICK LEIGHTON to the students of the Royal Academy.* It is no less a duty to consider what was said on the subject of painting.

The defects of German painting, according to the President, arise from its being "primarily ethic in its complexion." Hence it is "wanting in the instinct of congruity and fitness, the sense of rhythm, and a perception of the value of restraint and repose." Music, not painting, is the endowment of the race, for "it is not on waves of light but on waves of sound that it has been given to Germans to carry us into the purest region of æsthetic delight."

In our notice of the President's criticism on German architecture we endeavoured to explain that the architects did not always err through a deficiency of gifts. There was, among other controlling causes to which they were subject, a national spirit which had to be obeyed, and which would not tolerate arrangements for the sake of effect if they entailed any diminution, even imaginary, of the dignity or self-respect of those who used the buildings. May we not also say that German painters were not more free than the architects? It is not to be supposed that either architects or

painters were coerced. They shared the prejudices of their contemporaries, and were willing to sacrifice art itself to the claims of duty. It will be said that artists have no right to consider themselves as subjected to the limited conditions of time and place. They ought to be citizens of the world, or rather should belong to a region where only the beautiful was valued. "My library," said PROSPERO, "was dukedom large enough," and it may be held that a painter whose world is not confined by his studio walls, or the limited field his vision can seize when representing nature, is not worthy of the name. In one sense that theory may be true, but as everyone suffers whose life is devoted to abstractions, on the other hand an artist must gain when he shares in the joys and sorrows of his fellows. The German artists were always children of their time, and from their mental qualities they appear to have been more sensitive than the rest of their countrymen to the influence of everything that was likely to affect their country for weal or woe. A remarkable example of it was seen in the character of the artistic revival which was attempted about sixty years ago. A predecessor of Sir FREDERICK LEIGHTON in the presidential office, in referring to it, says:—

The efforts to create a new style of art in Germany in the beginning of the present century were intimately connected with the struggle for political independence. The cathedrals and churches on the Rhine had been more or less desecrated and plundered, and the pictures by the early German masters dispersed and sold. The gradual recovery of these ended in the formation of collections of such works; this led to a higher appreciation of their merits, indulgently seen as they were by patriots anxious to restore and maintain all that especially characterised the German nation. With men thus inspired, the connection of such feelings with the religion of their forefathers was obvious. German artists and writers again, who visited Italy, dwelt on the relation that had subsisted between Germany and Italy before and since the revival of letters, not only in politics but in the arts. The tower at Pisa, the church of St. Francis at Assisi and other buildings had been erected by Germans, and it was remembered with pride that the new life of Italy had been kindled chiefly by the genius of the northern nations. The spirit of the Middle Ages was thus in a manner revived, and the Germans looked with complacency on that period when the Teutonic nations, unassisted (as they assume) by classic examples, produced a characteristic style of architecture, and developed their native feeling in the arts of design and in poetry. In those ages architecture, the most necessary of the arts and therefore the first in date, had time to develop itself fully, especially in the north; but before painting could unfold itself in an equal degree, the thirst for the revival of classic learning and the imitation of classic models prevented the free formation of a Christian and national style. The early specimens of art which were most free from this classic influence were thus regarded with higher veneration, and the Germans of the nineteenth century boldly proposed to throw aside all classic prejudices, however imposing, and follow up the imperfect beginnings of the latter Middle Ages in a kindred spirit. This general aim connected the early efforts of Italian art still more with those of Germany, and the German painters who visited Italy recognised the feeling that inspired them in all works which were supposed to be independent of a classic influence.

The degrees in which this spirit has prevailed have naturally varied. With many the imitation of the earlier masters soon gave place to a juster estimate of the general character of the art. The antique has even, to a certain extent, reassumed its empire; but, on the other hand, some of the best German artists have unflinchingly maintained the general principles above described, even to the present day; indeed not a few had at first returned to the old faith, and had imbibed with it a still deeper attachment to the spirit of the early painters.

It is necessary to bear these facts in mind in order to understand the particular aim which many (perhaps the best) of the German artists have in view. The veneration for the general spirit which prevailed at the revival of art was accompanied by an imitation of the characteristics and even the technical methods of the early painters.

It will be said, of course, that the Germans would have done better if they had divorced nationality from painting, but that would signify the transforming of themselves into nondescript beings, which is about the last ambition of the Germans. They try to be in all things true to their own nature, and if their spontaneous action leads them to error, sooner or later a remedy will be found.

A memorable endeavour to obtain that remedy took place in Munich many years ago. The intellectual omnivorousness of the race was exemplified in the reign of King LUDWIG. Instead of keeping to early German and early Italian art, all the styles of painting were turned to account partly for the embellishment of the Bavarian capital, but mainly for the education or development of the powers of the artists. The outsides of buildings were painted as well as the interiors, the production of stained-glass became a public duty, copies of foreign buildings were set up, and sculpture

* *The Architect*, December 15 and 22, 1893.

was attempted on an unprecedented scale. Some of those works are no longer prized; the exterior frescoes especially have suffered, and have made foreigners believe that the endeavours of the king and the artists were only a waste of energy. That is only a short-sighted view. In spite of the loss of qualities which made them appear brilliant to the eye, the Munich works merit the most sympathetic appreciation of the world. They are the

particular artist accepted as the representative of German painting. We may allow that OVERBECK was faithful to the early Italian, if not the early German ideal, although in his faces there is a psychological significance which essentially belongs to the nineteenth century. But if the works of CORNELIUS, HESS, KAULBACH, SCHNORR and others are compared with OVERBECK's, although there may be correspondence in the subjects, it will be found that the treat-



THE GENIUS OF PAINTING. By Wilhelm von Kaulbach.

evidence of enthusiastic and self-sacrificing efforts in training in order to reach an elevation in art which previously had not been attempted. If sceptics will say they are only signs of the failure of a roundabout process which was inspired by vanity, it is the expression of the same truth in a different manner.

One of the consequences, however, was the overthrow of the principle which would make a particular school or a

ment is differently inspired. We have no desire to advocate such indifference to a common standard as is witnessed in Paris exhibitions, where libertinism appears as impressionism, naturalism, individualism and so on; but among the greatest blessings which fell on German art was the failure to establish a pet style under Court favour. In the decoration of the Munich Palace under the eyes of LUDWIG himself independence asserted itself.

It might be supposed by people unacquainted with the subject that German painting in general comes under Sir FREDERICK LEIGHTON'S censure from being "primarily ethic in its complexion." The truth is, an exhibition such as may be seen in Berlin or Munich is as varied as one in Burlington House. The independence of selection and feeling which was not to be controlled by all the king's efforts or all the king's men half a century ago is as strong as ever. Instead of ethic being paramount it is sometimes too rigorously kept down. But, after all, is the quality so pernicious? A German painter naturally thinks of German patrons and German critics, and if they desire an ethic element in a picture (which the painter is very glad to introduce) are they to be told it must be kept out because it may interfere, according to English and French notions, with the sense of rhythm? Is there no compliance with the requirements of the market in England? As long as the arbiter in art among us is the dealer, it becomes us to hesitate before setting up canons of æsthetics for the edification of other men. It will be time enough when self-sacrifice for the sake of principle prevails in England to set up as moralists. But when a picture is "ethic in its complexion" is it necessarily defective or inartistic? We are told it is possible to find sermons in stones and books in the running brooks. Do the stones and the water become less interesting on that account, and are representations of them diminished in value if they give rise to sermons and books? The truth is, the admiration of the simplest thing is a complicated affair when it is analysed. PETER BELL'S condescending recognition of a primrose by the river's brim was in its way rather ethical. The case as regards painting was expressed in two or three sentences by Sir JOSHUA REYNOLDS. In his fourth discourse he said, "The value and rank of every art is in proportion to the mental labour employed in it or the mental pleasure produced by it. As this principle is observed or neglected our profession becomes either a liberal art or a mechanical trade. In the hands of one it makes the highest pretensions as it is addressed to the noblest faculties; in those of another it is reduced to a mere matter of ornament; and the painter has but the humble province of furnishing our apartments with elegance." In other words, the disregard of the ethic complexion produces ornament rather than pictorial art.

As we are allowed to give an illustration from one of the most remarkable examples of the German ethic class, we can judge whether the mental labour advocated by REYNOLDS will frustrate our enjoyment. KAULBACH has symbolised his notion of painting in the figure of the genius of the art. The subjects of the panels borne by the attending cherubs suggest that at the time he was under the influence of the ideas which EASTLAKE has described, and held early Christian art in reverence. The genius, as we see, stands above the world and glances from it towards heaven. It was such a position as KAULBACH himself assumed when he attempted to paint a philosophy of history. From his point of view he could not be much concerned with individuals. He saw man as part of a mass. He therefore was the painter of vast operations which changed the character of the world—*The Destruction of Babel and The Dispersion of Mankind, Homer and the Greeks, The Destruction of Jerusalem, The Battle of the Huns and Romans, The Crusaders, The Age of the Reformation*. He did not neglect the influence of the individual, for, supplementing his series, he painted figures of great law-givers, MOSES, SOLON, CHARLEMAGNE, BARBAROSSA. The mind of KAULBACH, however, gravitated towards universals rather than particulars in art.

The worst allegation which can be brought against any of the large works of the series is that they embody not one but several dramas. *The Battle of the Huns* not only represents a fierce struggle on earth, but the old enemies are supposed to have risen from their graves and to have grappled with each other in the central blue. In defence of the picture we may ask, Could racial hatred, which, as we know, still survives, be suggested in a more effective way? Vast bodies of men can struggle against each other for a principle or under compulsion, and afterwards retain no animosity. But in such a battle as KAULBACH depicted the enmity was inherited from forgotten ancestors or was an instinct, and it would be useless to represent its effects by the ordinary rules for battle pictures.

In *The Destruction of Babel* it is also objected that there are many historic events brought before the spectator. From the first days of painting, attempts have been made occasionally of the same kind, by connecting in some way past and future actions with those which are represented, or to bring things which were remote into relationship with those that are present. The several scenes of *The Destruction of Babel* form in reality a sort of chain of events, a correlation of consequences, which cannot be detached without destruction of the magistral idea of the artist, by means of which we see—

Large elements in order brought,
And tracts of calm from tempests made,
And world-wide fluctuation sway'd
In vassal tides that followed thought.

It cannot be too well remembered that a work of art is not intended for the enjoyment of artists or of critics alone. The public must also be considered. Now any one who has observed the pleasure with which KAULBACH'S mural paintings are explained by parents to their children, or by groups of students who are competent to grasp the admirable method on which his arrangement is based, will grant that there must be a peculiar interest in the series of works. The wall-paintings are not passed like the ancient and modern works which are to be seen in annual exhibitions or in public galleries. They not only attract attention, but they reward it, for the endeavour to understand the aim of the author unfolds the expectation of new possibilities for painting whenever artists will cease to be satisfied with the production of what REYNOLDS calls a "mere matter of ornament." In no country of Europe is there less regard for the ethic in art or literature than in France. It is well known, however, that the most competent judges in that country admitted the grandeur of *The Destruction of Babel* when the cartoon was exhibited in Paris in 1855. M. MAXIME DU CAMP declared that in KAULBACH were, above all men, united in the highest degree "l'idée et la forme." After pointing out the grandiose thoughts, the elegance and truth of the forms, the aspiration towards the ideal, the originality of treatment, M. DU CAMP boldly came to the conclusion that there was not one artist in France who was so capable as KAULBACH to treat biblical subjects, or to expound them with such exalted illumination, and if he could have the awarding of an extraordinary medal for the "plus fort" artist of the age he would without hesitation select the German painter as the man. After that judgment KAULBACH'S works are not likely to be affected by objections to their ethic principles.

A CELTIC CROSS.

WHILE a grave was being opened in the churchyard of Abernethy, Perthshire, the sexton, with the aid of the Parochial Board inspector and others, unearched a stone slab bearing on both sides an incised cross of Celtic form. The stone is sandstone (conglomerate), 27 inches in length by 21 inches in breadth and $7\frac{1}{2}$ inches in thickness. The obverse side has carved on it the shaft of a cross the full length of the stone and $7\frac{1}{2}$ inches in breadth, with Celtic work upon it, but so weather-worn as to be scarcely visible. Unfortunately, it is broken at the semicircular hollows where the shaft joins the arms, and the part containing the arms and the summit is not yet discovered. At the part of the stone near the semicircular hollows the evidences of tracery are very clear. The form of the shaft now discovered gives the irresistible impression that if the upper part of the large cross could be found the whole would resemble the cross at Haw Rhill, Alloa (Anderson's "Scotland in Early Days," p. 92). On the reverse side is a cross about 16 inches in length and 7 inches from arm to arm, with traces of what may be oghams near it, weather-worn. The stone slab was found at the foundation-wall of the parish church, demolished in 1801. It was one of the oldest Celtic churches in Scotland and stood near the old Celtic round tower in the churchyard. A picture of it is preserved in Grose's "Antiquities," and its origin is lost in antiquity. It has been, on very substantial grounds, supposed to be the church spoken of in the Pictish Chronicle as the work of a Pictish king. It is said that "Gartmaidh built the church of Abernethy 225 years before the church of Dunkeld was built by King Constantin." At the foundation-wall of this church the present stone was found. According to Dr. Skene, the church supplanted the former one, built as a result of Columba's preaching among the Picts, which again, according to the same authority, supplanted the church of wood and wattles—the result of St. Ninian's preaching among the southern Picts, who had their capital at Abernethy.

THE WINTER EXHIBITION.

THE first picture in the Winter Exhibition at the Royal Academy that is likely to compel the attention of the visitor who follows the order of the catalogue is *The End of the Harvest*, by the late G. P. CHALMERS. If it had been painted by MILLET it would be popularised throughout the world by means of etchings. It is sombre, solemn and symbolic. The night cometh and a storm is also approaching, but in the darkness two women are struggling against fate by labouring. Their toil is nearly complete, for the three sacks are almost full. In the rear is a weird line of trees. *The Plough*, by the late FREDERICK WALKER, is hung near CHALMERS'S work and is worthy of the companionship, but as it glows with the warmth of the setting sun while brightened by the rising moon, it is less pessimistic in intention, less suggestive of the dreariness of life than the Northern painting. *The Trossachs* must have been one of TURNER'S best interpretations of Scottish scenery, and probably was crowded with fine detail, but now there is so little left of his characteristic handling it might be ascribed to an inferior artist.

PHILLIPS'S pictures are valued so highly in the market—owing, no doubt, to the diplomacy of dealers—the least hesitation about acknowledging their greatness is put down to incompetence. The *Early Career of Murillo* undoubtedly contains some excellent heads, which are painted with breadth, but the composition is unskilful, the colours are unsatisfactory and clayey, there is no sign of thought about the arrangement, and, above all, the picture is not suggestive of Spain or a transaction which occurred in the open air. With all its palpable defects there is far more “go” about ETTY'S *Pluto and Proserpine*, for the painter has expressed his intention, which was to represent the suddenness of the appearance of Acheron's dusky monarch and his irresistible abduction of the daughter of CERES. We suppose it was painted in Buckingham Street, Strand, but there is less of the studio stuffiness about it than in the picture by the man who was popularly supposed to set up his easel before the scene he was to represent. The owners of PHILLIPS'S costly pictures are wise in secluding them, for when one of them appears in public it reveals that the artist's elevation above so many of his contemporaries was mainly secured by the machinery of trade.

There are several portraits in the first room by SHEE, OWEN, T. PHILLIPS, HOPPNER and COTES. As they were all Academicians we suppose their efforts are entitled to admiration, but it is not easy to attain that end in front of the works on a wintry day. Most of the portraits that await the visitor in the first room would be chilling at any time. GAINSBOROUGH'S *A Page* is another Blue Boy, but, unlike Master BUTTALL, he is over-nervous and might be a girl in a ballet. The artist's treatment emphasises the weakness. Among the landscapes are a riverside scene, a waterfall and glen with a rainbow, by J. S. COTMAN, both admirable; two by DAVID COX, whose work in oils is not abundant; an early and quiet scene by CONSTABLE, an effective *Harvest Shower* by W. COLLINS, and views by WILSON, NASMYTH and CROME. The *Young Anglers*, by GEORGE MASON, gives no revelation of his genius, but the *Wayfarers*, a modern BELISARIUS and boy, by FREDERICK WALKER, is a masterpiece.

There is not much need of a catalogue for the pictures in the second room. The Dutchmen who, as usual, are installed in it were, like Greek architects, in the enviable position by which success could be gained without any harmful exercise of the imagination. There was no need to invent new subjects. A little variation was all that was needed to distinguish one *Landscape with Cattle* from another. Let a man once succeed with a group of smokers or toppers, a canal scene, or a party of soldiers, a piece of still life, an interior of a building, a family merrymaking, a stormy or calm seascape, and he was endowed by his countrymen with a sort of perpetuity, for he could go on with repeating the subject as long as he liked. When a great artist like REMBRANDT endeavoured to manifest his versatility he suffered. The Dutch patrons did not care to undertake the exertion which was necessary if novelties were set before them.

One year's exhibition of the Dutch school is therefore marvellously like the one which preceded it, and is not likely to differ much from its successor. To say that

examples are to be seen this year by the VAN DE VELDES, BERGHEM, TENIERS, TERBURG, CUYP, SNYDERS, JAN STEEN, VAN OSTADE, HOBBEEMA, WOUVERMAN, RUYSDAEL, BRAUWER, will be sufficient to suggest the character of the collection. Some pictures are in excellent condition—such as the brilliant *Garden Scene*, by PETER DE HOOGE, and the *Dutch Interior*, showing a room lined with Venetian leather. The *Shepherds and Herdsmen Resting at Night*, by REMBRANDT, and his pupil EECKHOUT'S *Portrait of a Man*, which is worthy of the master, are among the novelties. They belong to the Dublin Gallery, and are evidence that treasures may still be secured at most moderate prices by those who have the sense to avoid relying on the judgment of dealers.

The collection in the large room starts with HOGARTH'S *Wedding of Mr. Beckingham and Miss Corbett*, which took place in Bishopsbourne Church in 1739. The artist found little difficulty, as all the world knows, in making an amusing subject of hymeneal rites, but in this case his orthodoxy and conservatism made him sedate. The parson and his clerk were evidently adapted for caricaturing if the artist did not restrain his hand. His imagination asserted itself in the Cupids he introduced around the chandelier, that are delightful. What appears to be most remarkable in this work, as in so many others of HOGARTH'S, is the freshness of the colours. GAINSBOROUGH'S *Queen Charlotte* is not quite such a failure as the majority of the commissions for recording lies on canvas. In his *Hon. Mrs. Thicknesse* he was hampered by the difficulty of suggesting that the lady could perform on the violoncello as well as the mandolin, while her robe being of a costly kind, not a frill was to be concealed. With *Charles Frederick Abel* the skill as a performer could be taken for granted, so it was only necessary to represent the composer as deriving inspiration from gazing on the spectator. In his *Sleeping Nymph and Satyrs* ETTY wished to compete with TITIAN and RUBENS. When he completed it as a diploma picture we may assume he thought, like many other painters, that he ought to be merciful towards the “deposits,” past, present and future, rather than just to himself. TURNER'S *Van Tromp's Shallop*, which dates from 1832, is in a condition which enables the spectator to realise that the waves have motion and power.

We next meet with a variety of Italian works. *The Flight of Europa*, by VERONESE, is an able version of the story, all the figures being apparently in good condition. The two views of Dresden, by BERNARDO BELLOTTO (IL CANALETTO) are preferable to many of his Italian views, and they reveal that he could paint a better landscape than his uncle. TITIAN'S *Mother and Child* must have been delightful at one time, before the meditative looks of the woman were obscured. The *Holy Family*, by SEBASTIAN DEL PIOMBO, bears out the theory that the artist was aided by MICHEL ANGELO, for the figure of the Virgin appears akin to the Sibyls. Whoever painted the *Portrait of a Senator*, ascribed to RAPHAEL, was a master, for it must be considered as the finest work of the class in the exhibition. In PARMIGIANO'S *Holy Family* we have not only figures that have gone through a process of extension, but are novel types. The background is excellent. VANDYKE'S *Andrea Spínola, Doge of Genoa*, was a difficult work. The grandee's head and face were small, and it was necessary to represent him in the crimson robe of office with a large ruff. The painter has succeeded by accepting the difficulties and meeting them all in a thorough way. Undoubtedly there is an excess of red in the picture, but the fascination which comes from the scrutinising eyes and the subtlety of the whole face affords compensation. VANDYKE was on his metal before such a man, while probably he despised the neighbouring subject, *James Stuart, Duke of Richmond and Lennox*.

It is a pity the Academicians do not treat the world with an exhibition from which REYNOLDS, GAINSBOROUGH and TURNER will be absent. The novelty would be welcomed. By the first of the Presidents are portraits of Lord AMHERST, Mrs. JELF POWYS, Lady SUNDERLIN and the Marquis of TAVISTOCK. GAINSBOROUGH'S *Lord North* gives a new version of the good-humoured statesman, and his *Mrs. Robertson* would be more delightful if we could be assured the painter was not engaged in a scheme to convince the Prince Regent that “Perdita” was always thinking of His Royal Highness. TURNER'S pair of views in

Petworth Park will give rise to general disappointment. The subjects were worthy of his best efforts, and as far as can be judged he was unusually careful in treating them. The lovelier has been unhappily transformed into a monochrome, and the harmony of colours in the other is disturbed. *The Wreck of the "Minotaur"* manifests TURNER's power of a supreme sort in dealing with the sea in its wrath, but how a man whose spirit was equal to such epic efforts could paint the *Chain Pier, Brighton*, and the row of blocks or houses near it as if he enjoyed the unbending stiffness of the builder and engineer, is one of the mysteries of art. Apparently the subject was prescribed to him at the same time as the Petworth scenes and the *Chichester Canal*, and TURNER felt he was bound to accept the commissions unquestioned, and to make the best of them.

The oldest works of Italian, Flemish and German schools are as usual in the fourth gallery. The first is a *Virgin and Child*, described as by GIOVANNI BELLINI. It belongs to Dr. RICHTER, and there is likely to be authority for the authorship. But from the style, it has far more affinity to a very early work of the Florentine school. The face of the Virgin is almost Byzantine. The drapery is in stiff, conventional folds, and the edge of the blue robe has an embroidery made up of mysterious lettering. Beside it is another *Virgin and Child*, by GIOVANNI BELLINI, from Lord NORTHBROOK's gallery. It is Venetian in style. There is no idealisation of the Virgin, whose face seems to be a portrait of a comely girl; the drapery is almost without a fold, and the whole picture is as genial and homely as any of MURILLO's. We must expect puzzling contrasts when Old Masters are brought together, but rarely is one so remarkable as in the present case. GIOVANNI BELLINI in the course of his long life often modified his manner, but his existing works do not warrant the belief that he passed through the extremes of which the two Madonnas are the signs. What seems to be a more characteristic example of the master is the *St. Jerome*. It represents one of those rocky regions which at one time were supposed to be conventional, but are now said to be dolomitic. The saint is dark brown, "the shadow'd livery of the burning sun," which appears more Moorish by the scanty white drapery. Among the rocks is a white rabbit, which at once attracts attention.

In the *Virgin with Angels*, by FRANCESCO DI GIORGIO, the Divine Child has very white hair, which is novel. The Virgin's robe is richly embroidered, and the background is elaborately gilded. In MANTEGNA's *Virgin and Child*, the face of the Virgin is of a sorrowful cast. She wears a brooch of four pearls, arranged crosswise, to which CHRIST points. Above is a wreath of leaves and fruit. *The Saviour*, by CIMA DA CONEGLIANO, is a full-length figure in a red robe, corresponding with one in the Dresden Gallery, which used to be ascribed to GIOVANNI BELLINI. FRANCIA's *Virgin and Child* suggests the goldsmith by the beautiful form of the dish on which fruit is presented by an angel. CARLO CRIVELLI's picture would be interesting if it were only for the fly represented on the balustrade, which recalls many a legend of dexterity. The *St. Sebastian*, by ANDREA ORCAGNA, is a departure from the accepted type, for instead of a wounded nude youth we see a very resolute, bearded man, in the prime of life. He is clad in a dress that is adapted from what was worn in Florence in the fourteenth century, and carries the arrows in his hand. Probably the painting is a portrait.

The two "cassone-fronts," by PAOLO UCCELLO, suggest what the pride, pomp and circumstance of glorious war signified in the fifteenth century. Imagine the King of Diamonds opposed to the King of Hearts, while their Majesties the Kings of Clubs and Spades await the issue to determine what course they will take, and that the general camp, pioneers and all, are as gorgeous as their lords, and a faint notion may be obtained of the two pictures in their pristine state. The Field of the Cloth of Gold must have been commonplace beside the battle-scenes at Anghiari which UCCELLO has depicted. The pair are a wondrous record of heraldry and other decoration as well as costume, but the military tactics are incomprehensible.

The two *Scenes from the Life of San Zenobio* are long panels representing miracles performed by the bishop. The treatment is traditional. Laymen and women exclaim

with wonder, while acolytes and servitors are unmoved, as if accustomed to miraculous deeds. They afford a little knowledge about some customs of the fifteenth century. For instance, the hands of people who were supposed to be demoniacs were bound before they were freed from the spirits. What is most remarkable in both are the architectural backgrounds. Every line is as carefully ruled, the curves are as accurate and the ornament as complete in detail as if the paintings were to be employed as models by builders. It is only in an age when architecture is esteemed that so much exactness would be tolerated. It would be ruin to a modern painter in England if he made a background of that kind so obtrusive. The two pictures are ascribed to BOTTICELLI, and they might have been painted when he played, as it were, to the gallery. But the SANDRO who can move those who have grown wearied of the majority of masterpieces is seen in the small *Virgin and Child with St. John*, which is the gem of the exhibition. It is one of those in which a balustrade is introduced as a seat, and the artist has formed the front with bronze panels which almost appear to be efforts to realise a Greek work from a description. The Virgin holds CHRIST on her lap. On her head is a transparent veil which, like all parts, is finished with loving care. She gazes thoughtfully on the BAPTIST, who kneels below and with clasped hands appears to express affection rather than reverence. In this picture there is no trace of SANDRO BOTTICELLI's vehemence or the uncertainty which came of conflicting ideas. Intended probably to be hung before a *prie-dieu*, it seems to have been painted in a humble spirit and has the simplicity, refinement and pathos of a hymn.

This year the *Madonnas* are numerous, and make a sort of sanctuary of the gallery. There are two from the Northbrook Collection, which deserve attention because they are evidence of a time when painters desired to surround the noblest subjects with whatever was best on earth, and therefore employed architecture. One is by MABUSE, the other is probably his work also. In the former there is a somewhat original arrangement. According to the catalogue, the throne on which the Virgin is seated "is of marble, with conch-shaped canopy and semi-circular back; the foot-pace of the throne rests on four brackets, between which are panels of bronze with representations of DAVID and GIDEON." It would take long, however, to fill up that outline, for every part displays most refined detail. In the companion work the alcove in which the throne is placed is no less elaborately worked out, and what tapestry, ornamentation, drapery, or other arrangement would be equally dignified and worthy of the figures that are depicted? In the *St. Jerome* of ANTONELLO DA MESSINA we see the Father reading on a platform in a comfortable study, which is approached through a hall having very slender columns; the departure from the ordinary treatment will be approved. The *St. Giles*, which is Netherlandish, is a welcome visitor from its novelty. If St. HUBERT was the patron of the chase, St. GILES has a claim to be taken as the patron of the chased, for we see him protecting a fawn by allowing his hand to be pierced by the hunter's arrow. As a foil to the earnestness of the early works, there is an *Entombment* by LUDOVICO CARACCI.

The interest which the thirty paintings by the late JOHN PETTIE excite can hardly fail to be mixed with regret for the loss of an artist when his power was strongest. Among all the northern painters of our time he appeared to be the most qualified to become the illustrator of WALTER SCOTT. There is nothing of the professional model in strange costumes or in inconvenient attitudes in PETTIE's paintings. He had a gift enabling him to project his mind into the past and to paint old ways of life as if they occurred before his eyes. At the same time there was a shrewdness and humour in him, as in SCOTT, which not only kept him from allowing imagination to run into excess, but often imparted additional interest to his works. Look, for example, at the *Gauger and the Smuggler*. The wild cateran who grips the officer by the hair and has gained a "crook" on him with the right leg while trying to pierce him with a skean, seems to be as formidable an enemy as the octopus in HUGO's "Travailleurs de la Mer." But the elderly gauger is not surprised by the attack. We feel he is familiar with Highland tactics. His aim is not to kill the young

culprit, but to preserve him uninjured with a view to his appearance in court, when law and the excise will be vindicated. He does not use his pistol, but trusts to his strong arms, coolness and conviction of superiority. The Greek sculptors sometimes made their victorious warriors appear as smiling; this burly gauger seems ready when the struggle is over to become jocose. What painter has expressed so vividly the farmer's satisfaction over a plenteous harvest as we see it in *The Laird*, where a Scottish BOAZ with his hands in his waistcoat pockets contemplates his reapers with the air of an ancient amateur in a picture gallery, or MONKBARNES before his Roman Prætorium? The *Jester's Merry Thought* is as hilarious as an event in the life of the Clerk of Coptmanhurst. There is even more amusement in *Two Strings to her Bow*, for we can almost hear the girl's laugh at the awakening from love's young dream on both sides of her. *Ho! ho! ho! old Noll*—a young cavalier caricaturing the Lord Protector for the enjoyment of his friend—suggests the spirit of one party better than a volume; while the single figure of the *Puritan* is a revelation of the kind of men who upheld CROMWELL and made him feared through Europe.

Mr. PETTIE did not, we believe, attempt battle-pieces, for he preferred to express a subject by the aid of a few figures. Nevertheless, the spirit of a warlike age was suggested by him. The single figure, *Disbanded*, a stout Highlander returning home laden with arms and treasure, explains why the men of that race were to be feared when defeated. The *Chieftain's Candlesticks* is like a symbol of the loyalty which made a demi-god out of a mortal. *The Terms to the Besieged*, *The Flag of Truce*, *The Sally*, *The Drum-head Court-martial*, *The Threat*, &c., present before us the incidents that belong to a time when the sword was the only arbiter. To that time also belongs such scenes as *To the Death* (which was at first known as *Sword and Dagger Fight*), *Time and Place*, a man waiting for an adversary in a wood, and *Late*, which seems to be the adversary hastening to the duel. The *Jacobites* and *Treason* may be included with them. The collection has, therefore, far more unity than is common in similar cases, without being monotonous.

The execution of the works is admirable. Mr. PETTIE always seems to have had a definite idea about his schemes of colour, and whether he paints glaring tartans, cardinals' robes, scarlet cloaks, the brilliant doublets of cavaliers, or gorgeous dressing-gowns, he contrives to subdue the harshness. His figures become so life-like, one is tempted to speculate about their histories, for they all seem to have idiosyncrasies. The painting is vigorous, yet in some cases, as in *The Drum-head Court-martial*, the heads would bear comparison with MEISSONIER'S for effect.

Very different is the sensation which is afforded by the collection of STOTHARD'S drawings or designs for the illustration of books. Who can believe that the gentle beings represented in them were representatives of English life at one time? Yet they were appreciated in the early part of the century because of their naturalness. STOTHARD was to the *Spectator* and GOLDSMITH what PETTIE might have been for SCOTT. But probably the artist becomes more attractive when he draws little children. The amorini of ALBANO, CORREGGIO or RAPHAEL do not surpass STOTHARD'S. Only in that marvellous company which TITIAN threw across the middle of his *Assumption*, as if it were a living cloud, are they excelled. The miniature drawings by STOTHARD would be enough to form an exhibition.

While time has preserved all the beauties of his sketches on paper, scant mercy has been shown to his works in oils. It is not often we can see such general obliteration among modern pictures. Faded as is the colouring, it appears to be a survival of something in the manner of GIORGIONE or TITIAN. The forms also recall Greek types. The pictures may in their present state have the indefiniteness of a dream that is not unlikely to have surpassed the reality. The best preserved of STOTHARD'S paintings are, it must be said, far less inspiring than those which years have mutilated, and over which the imagination can revel.

In the little Black and White room is a replica set by WILLIAM BLAKE of his "Illustrations of the Book of Job." Special gifts or graces must be bestowed on a man to enable him to comprehend BLAKE'S work. We have not been so

favoured. Accordingly, the figures of divine and mortal beings which are represented do not in any way correspond with those which we can imagine as the *personæ dramatis* of the ancient narrative. Throats may, it is true, be developed on earth by singing anthems, but angels with throats that extend to their shoulders are hardly pleasing to the eyes of mortals. To appreciate the figures it is necessary to have a scale of proportions which are not to be derived from living things. Is it not wiser, instead of imitating votaries and pseudo mystics, to regard the designs with pity as the creations of a distempered phantasy, or the aspirations of a second MICHEL ANGELO whose powers were paralysed and whose hand was not obedient to his will?

CHRIST CHURCH CATHEDRAL, DUBLIN.

THE renewed invitation of Dean Greene to all citizens of Dublin to visit the cathedral on St. Stephen's Day attracted a large number of visitors. At 12.15 P.M. as announced, Mr. Thomas Drew, R.H.A., the cathedral architect, as for some years past, delivered one of his popular lectures on the history and interest of the cathedral at Strongbow's tomb.

Mr. Drew conveyed to the visitors the hearty welcome of the Dean and Chapter, assuring them that the lawful custodians of the ancient cathedral of Dublin recognised the common property in it of all citizens of Dublin, with whose history it was so intimately bound up. It was happily an institution about which—differing from most ecclesiastical possessions—there was no memory of wrong or rivalry. The spoliation of monasteries by Henry VIII., the plunder of churches, the violent dispossession of communities in a time of polemical warfare had not touched the Christ Church of Dublin. It had never been "taken from" anyone. Its ancient community, dating from 850 years ago, in Queen Elizabeth's time slowly and imperceptibly conformed to changed usage; its ancient estates were untouched by spoliation until 1870. On its present dean and chapter, by unbroken devolution, had come the trust of this strange and interesting church.

Its survival, he said, after a series of unparalleled disasters beyond that of all other churches was strange. Its origin was strange. Nowhere else in the kingdom could be seen a church foundation of the Christianised Danes, and the church of Sygtrig Silkbeard was beneath the visitors' feet. The foreign character of Christ Church and ancient Dublin was emphasised. The Danes were exclusive and paramount in Dublin for 300 years. Eight hundred and fifty years ago Sitric founded his Danish church. In 1170 came the foreign Anglo-Normans, and in 1190, bringing their artificers and stones from their native English counties, they built on the Danish their Anglo-Norman church. They exclusively held the English City of Dublin and its State Church for centuries. Irish were kept without its walls except when they wanted to buy butter or hides or such country produce. The disasters of the church were the barbarous destroyal of the choir apse by Bishop John de St. Paul in 1350 (now restored by Mr. Street); the fall of the east end in a great storm in 1461; finally, the crowning catastrophe of 1562, when the nave slipped on the peat bog foundation, the south side was destroyed, the roof fell in, and the north wall thrust out 24 inches, as it was at present.

Other churches had lost their histories. Literature of Christ Church made a small library. Other churches had lost their records. Christ Church, Dublin, had an amazing wealth of such. It had sent lately about 2,000 documents for safe keeping to the Record Office, and had its most famous records still in hand. Its splendid missals, if gone from it, were still safe in the Bodleian. Its Mediæval plate was safe at Kilkenny, and of post-Reformation plate it had a cellarful of splendid gifts of former times.

Connecting history with some relics still to be seen the lecturer had a fund of story. The (traditional) heart of St. Laurence O'Toole, hung in the chapel of St. Laud, was a peg on which to hang an account of that remarkable man and historic prelate and founder. The tomb of Strongbow illustrated the English invasion. The supposed effigies of Basilea, sister of Strongbow, in St. Laud's Chapel, illustrated the story of the message of "the Fall of the Great Tooth," and the saving of the Anglo-Norman garrison of Dublin by that intrepid lady.

Again the old lectern had the story of the first reading of Queen Elizabeth's English Scriptures, and, by gradation from it, to the tale of the scandalous imposition of the bleeding figure of Our Lord and the condign punishment of the monkish cheats. Next the crowning of Lambert Simnel and his story. Oliver Cromwell and his desecration, illustrated by the charred and insulted royal arms. James II. and his two years' occupation of Dublin was recalled by the tabernacle and candlesticks used at his masses in this the ancient Chapel Royal, and his statue, brought with his brothers from the old City Tholsel once over the way.

NOTES AND COMMENTS.

THE French explorations at Delphi during the past year have been richly rewarded. They have not met with the original of the *Apollo Belvedere* or any masterpiece of equal importance, for it must be remembered that Delphi was plundered eleven times before NERO sacked the temple and carried off five hundred bronze statues. The explorations were not entirely fruitless of sculpture, for several figures more or less perfect and many fragments that reveal novel subjects were unearthed. The principal "find" was the treasury of a small Doric temple *in antis*, of which the details are fairly well preserved. It was a memorial of Marathon, and apparently was constructed at different times, for the work is not of uniform excellence. The operations at present are mainly directed towards the solution of an archæological mystery, that is, the place whence issued the "sacred breath" of APOLLO, which was supposed to inspire with prophetic fury the Pythia as she sat on the tripod, but sometimes was as fatal to that individual as would be the vulgar vapour of a long-disused well. That there was a cavern of some sort in connection with the oracle appears to be undoubted. STRABO describes it as deep, with a narrow entrance. It was supposed that NERO put people to death at the entrance and then destroyed the cavern. Another tradition was that the breath came from a secret chamber in the temple of APOLLO. It is among the ruins of that building the excavations are in progress. It is concluded that if such a chamber existed it is not likely to be entirely demolished, especially as it may have been connected with some underground opening from whence vapour was derived. The anticipated result excites curiosity, for it would be amusing if the breath of APOLLO was only natural gas.

THE Council of the Chester Archæological Society are able to congratulate the members on the satisfactory work in the city during the year. The excavations in the city were continued under the superintendence of Mr. I. MATTHEWS JONES by Mr. HAVERFIELD, and later by Mr. E. F. BENSON, and resulted in the discovery of a further number of Roman inscribed and sculptured stones of considerable interest. The work has now so far been completed. The archæological discoveries made in the city during the year include the following:—On the property of Messrs. DICKSONS, Limited, in St. John Street, a portion of the old Roman wall, which has been allowed, though at great inconvenience, to remain *in situ*. On premises at the rear of Messrs. WALKER & KNIGHT'S property, Northgate Street, in making excavations for a new building, a Roman hypocaust (*in situ*); an Elizabethan room; and a chimney top carved out of the solid sandstone, and enriched with the characteristic embellishments of the period; and several stone jugs. It is the intention of the owners of Axon's Buildings, Lower Bridge Street (RANDLE HOLME'S house), to preserve as far as possible this relic of ancient Chester. It is also probable that the authorities of the city will undertake the complete restoration of PEMBERTON'S Parlour, which fell in the early part of the year. There are now 260 members belonging to the society.

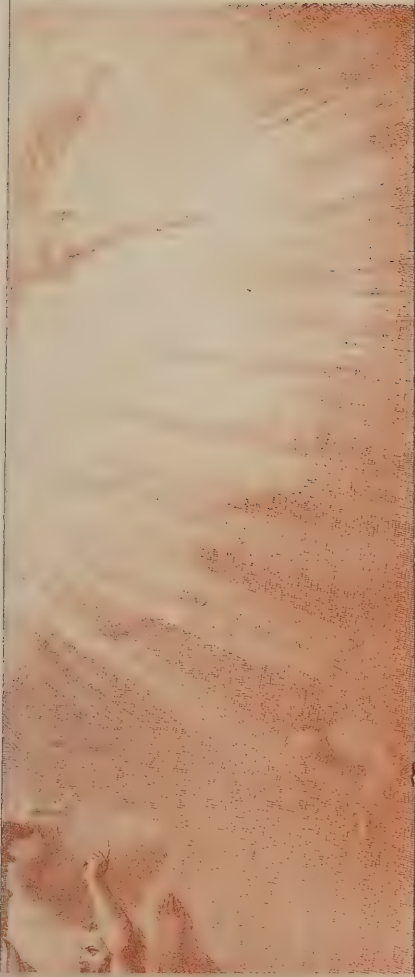
ONE of the oldest of the houses in Brussels has been lately restored and adapted by M. SAINTENOY, architect. We refer to the Hôtel Ravenstein, which many of our readers will remember seeing as they passed along the Montagne de la Cour, to which it is contiguous. The house dates at least from the fifteenth century, when it belonged to ADOLPHE CLEVES. According to SCHAYES, with the exception of it, a part of the Hôtel d'Egmont and the remains of the Hôtel de Nassau, there is no vestige of the habitations of the nobles in Brussels belonging to the period that was prior to the Renaissance. The building has been now arranged as a sort of club or "centre de réunions" for members who are devoted to literature, science and the arts. In fact, it will henceforth serve similar purposes as Burlington House does in London. The various learned societies can have their special quarters, while some parts of the building will be common to all.

One advantage will be that the new tenants are likely to endeavour to preserve the building from an entire modernising or demolition.

UNLESS unforeseen contingencies arise, the approaching Building Exhibition should inaugurate a new era for enterprises of that class. Hitherto, owing to a number of difficulties, the collections were generally more or less fortuitous. In next March an effort will be made to realise ideas which were matured before announcements were issued. The promoters, with Mr. T. FREEMAN, F.G.S., as honorary secretary, and Mr. LARKINS as manager, are resolved that the contents shall be select and representative. For that purpose they have secured the co-operation of a consultative council consisting of gentlemen possessed of experience for the preliminary arrangements, and will be guided by the experience of the latter. In that way there is a guarantee against making the financial success of the exhibition a primary consideration. The aim of the promoters is to bring together goods of all classes having those qualities which are necessary if they are to be specified by architects. It is desired that the appearance of all objects in the exhibition should be evidence of value and eligibility, and in the second place that they should be the productions of the firms who exhibit them. Certificates of excellence will be awarded, which are sure to be accepted as valid. It is possible that in the first attempt the intentions of the promoters may not be completely realised, for in such matters manufacturers have to be inspired with confidence, which, after their experience with international exhibitions, is not easy. However, all will be done that faith in a good cause will make compulsory, for sooner or later the promoters have resolved to succeed in establishing an exhibition that will be considered worthily representative of the most important building industries.

THE working machinery in brick-making, tile-pressing, joinery-work and metal-working will be interesting features that will lead to architects and buyers visiting freely. As regards the letting of space, the manager expects that the whole of the gallery will be let as well as the floor below. This being the first of five years' exhibitions, those manufacturers who take space the first year will have the option of the same site for the following years; hence those who do not exhibit in 1894 may be shut out, to their serious disadvantage, for five years. There will probably be competitive bricklaying, wood-working, turning, plumbing, &c., with prizes for the best mechanics; perhaps a gold medal or champion cup to be competed for annually.

THE annual general meeting of the Royal Society of Antiquaries of Ireland will be held in Dublin on Tuesday next. The following papers will be submitted:—"The Crannog of Moylurg," by Rev. GEORGE R. BUICK; "The True History of the Two Chiefs of Dunboy," by A. J. FETHERSTONHAUGH; "The Franciscan Priory of Ennis, Co. Clare, and the Royal Tombs therein," by T. J. WESTROPP; "The Journey of Sir HENRY SYDNEY, Lord Deputy of Ireland, against the Rebels in 1569, from the note-book of NICHOLAS NARBON, Ulvester King-of-Arms," by G. D. BURTCHALL; "On a recently-discovered Pagan Sepulchral Mound in the grounds of Old Connaught, Bray," by W. F. WAKEMAN; "An ancient Bone Comb and Tracked Stone found in a Prehistoric Mound at Kilmessan, Co. Meath," by OWEN SMITH; "Irish Flint Saws," by W. J. KNOWLES; "The History of the Shamrock on Irish Tiles," by WILLIAM FRAZER; "The English Language: Its Origin and Progress to the Sixteenth Century," by Rev. D. F. M'CREA; "Slieve-na-Calliaghe," by GEORGE COFFEY; "Structural Features of Lake Dwellings," by ROBERT MUNRO. On Wednesday the members will visit the recently discovered Pagan Sepulchral Mound in the grounds of Old Connaught, Bray. According to the annual report there are now in the society 189 fellows and 105 members, an increase of 50 over the number for last year. The financial condition of the society is also satisfactory.





THE DESTRUCTION OF BABEL: THE SCATTERING OF THE PEOPLE.

WALL PAINTING IN THE BERLIN MUSEUM.

By, Wilhelm von Kaulbach



PHOTOGRAPHED BY BEDFORD, LEMERE & CO.

DRAWING ROOM: "CRANFORD"

R. NORMAN

Jan. 5th 1894.

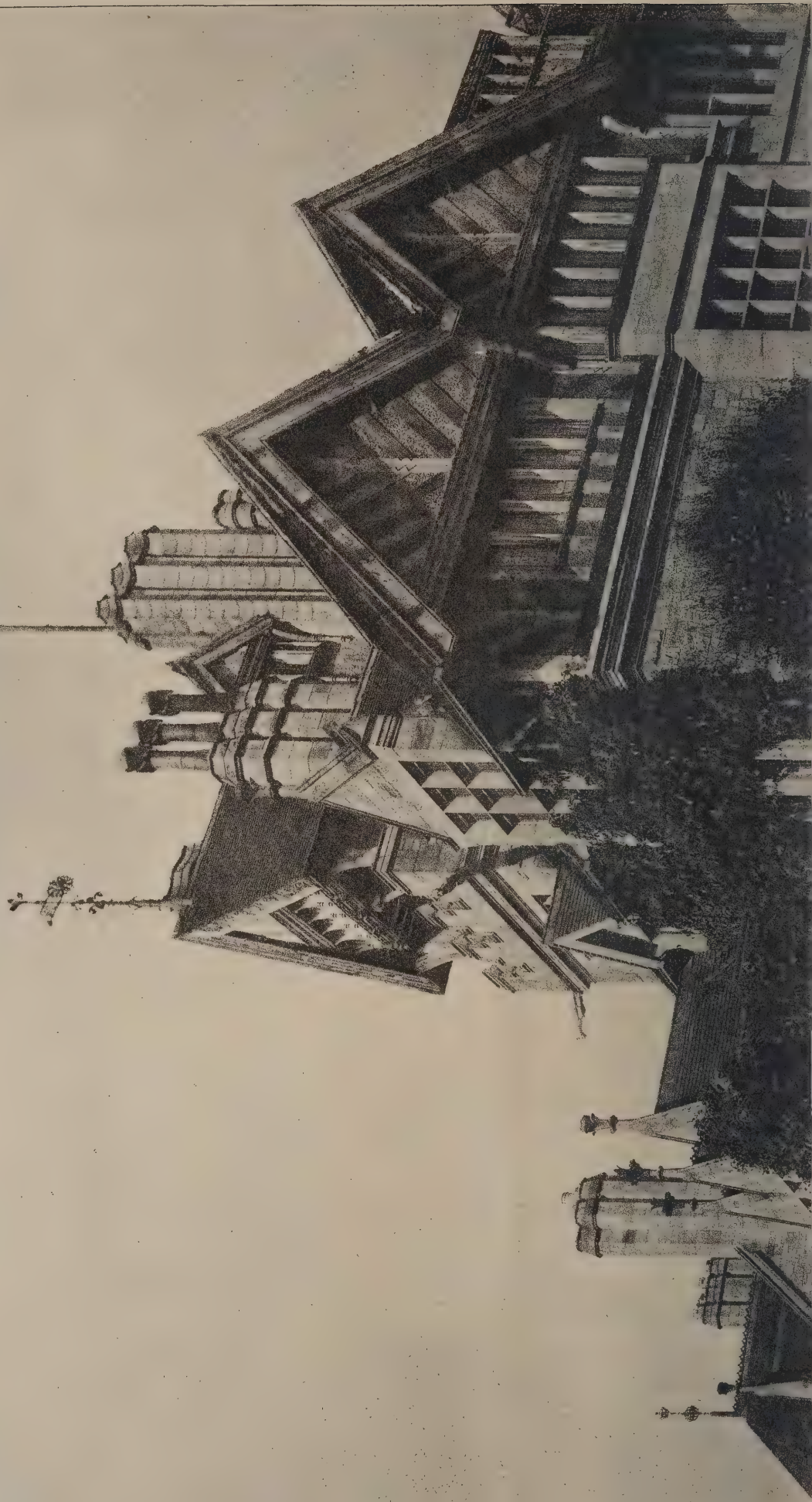


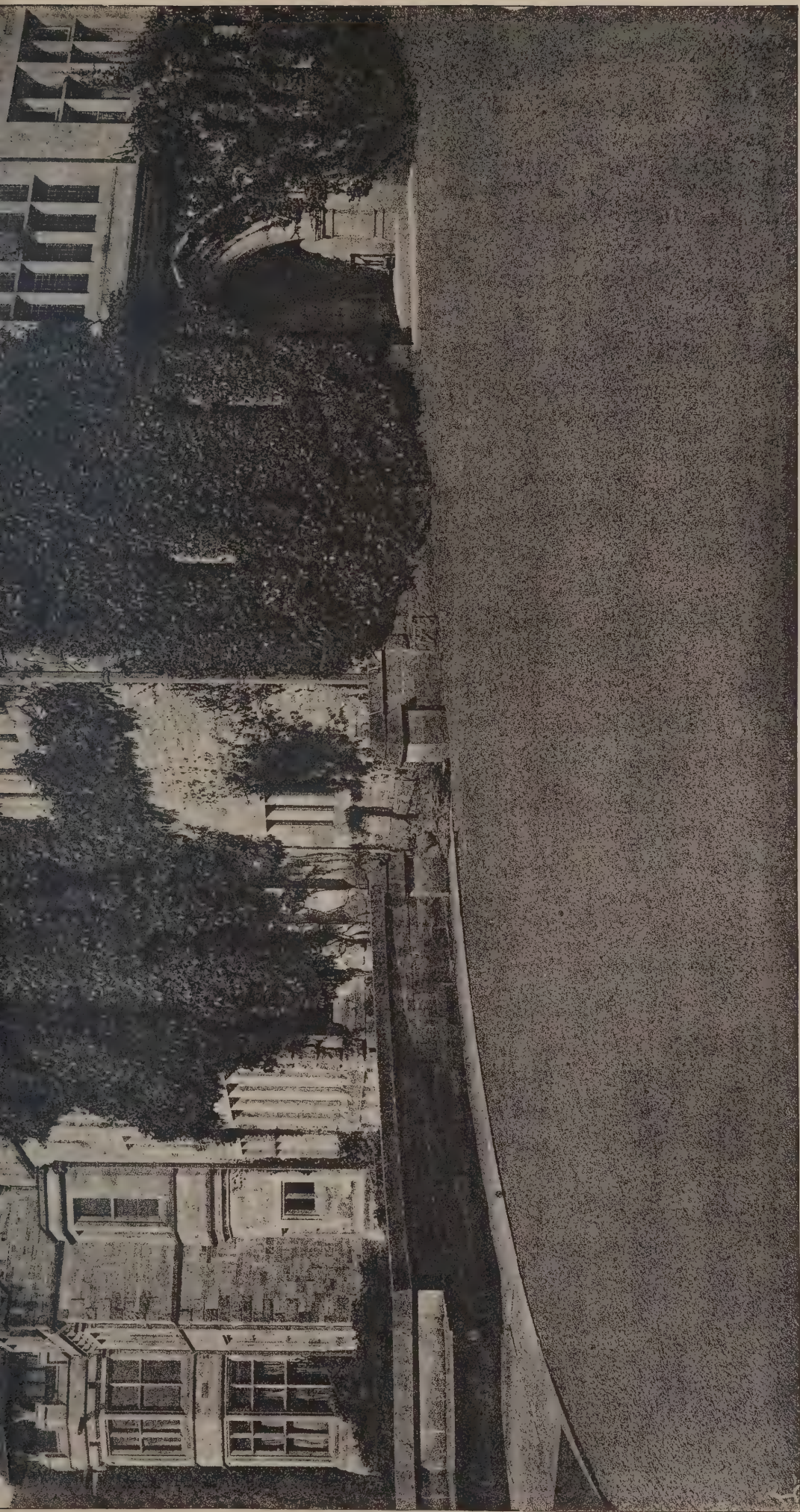
INK PHOTO SPRACUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

SIDE," NORTHUMBERLAND.

IAW, Architect.

The Architect, Jan: 5th 1894.





DETAIL ANGLE OF HOUSE: "CRAGSIDE," NORTHUMBERLAND.

R. NORMAN SHAW, Architect.

ILLUSTRATIONS.

CRAGSIDE, NORTHUMBERLAND. [R. NORMAN SHAW, R.A.]

THE DESTRUCTION OF BABEL, THE SCATTERING OF THE PEOPLE.

IN realising the great project which WILHELM VON KAULBACH placed before himself, which was, like MILTON'S, to "assert eternal Providence and justify the ways of God to men," his first effort was to display the movement which led to so many important events. The artist was a thinker, and he interpreted the history of the downfall of Babel in a manner which corresponded with modern theories. The old expositors of that history showed little sympathy with the desire for knowledge of the unseen which might be supposed to have animated those pioneers of science, the ancient builders, and they gloated over the failure, as if the ambition to ascend beyond the earth were limited to the Plain of Shinar. MILTON was among those who would allow no pity towards the men who were so daring in construction, and when describing them as stricken, his verse lost not only sweetness but grandeur:—

Forthwith a hideous gabble rises loud
Among the builders; each to other calls
Not understood; till hoarse, and all in rage,
As mock'd they storm: great laughter was in heaven,
And looking down, to see the hubbub strange,
And hear the din: thus was the building left
Ridiculous, and the work Confusion named.

NOW KAULBACH does not ignore the event, nor does he suggest there was fear in heaven of an invasion. On the contrary, he makes it manifest that he believed a wrong was done by the king, who, in the pride of his heart, like so many Eastern rulers, assumed he was more than mortal. But KAULBACH believed, with the English poet, that out of our broken days and deeds the infinite purpose of time is builded up solemnly and surely. He depicts, therefore, the dispersion of the tribes as a consequence of the confusion of tongues, but with one exception—that is, the evil implied in the central group—the artist avoids introducing anything which would signify his belief in the persistence of the confusion. We might almost suppose from what is seen that the scattering was an advantage for humanity—or of one part of it—as there was an elimination of elements which had been embarrassing to progress. The picture is not an illustration of the text in the ordinary way, for it is an interpretation which was inspired by universal rather than Jewish history.

The painting forms a series of scenes, among which there is not one which does not bear a relation to the general idea. The Tower of Babel has been condemned. The presence of the ALMIGHTY accompanied with angels bearing flaming swords is enough. There is no apparent mechanical or physical cause suggested for the catastrophe, but mysteriously, as if swayed by an invisible agency, the scaffolding is giving way and the workmen fall. It is so sudden and unexpected that some of the operations are not suspended. We can see a party of men, harnessed to a lorry, still drawing the shaped stones (the license was taken of rejecting brickwork), and the sturdy overseer who serves as driver gazes as if an ordinary accident had occurred. The woman who warns them appears to have seen still more terrors in another part of the building.

We may next glance at NINUS, who has set up his throne upon the lower and completed part of the building. This mythic personage, who is sometimes supposed to be an Assyrian HERCULES, represents monarchy at its worst, when the words "through Me kings reign" were not accepted. The idols or symbols of NINUS have been struck, but he remains unmoved. Like LUCIFER—

Round he throws his baleful eyes,
That witness'd huge affliction and dismay
Mix'd with obdurate pride and steadfast hate.

From his courtiers, poets, musicians, advisers and sycophants, "a crew whom like ambition joins with him or under him to tyrannise," he receives only mockery. There is a collapse of the old system, and they anticipate that under new conditions they will be the gainers. The concubines of the king remain, but they are helpless.

The upper part of the design may be said to represent pride and its punishment. But as mercy always tempered justice,

the picture would not be complete if it came to an end at the foot of the Tower of Babel. We are to suppose that for the subjects of NINUS there was to be no longer a general co-operation in embodying his schemes. Instead of being struck with the flaming swords they are separated into groups by deprivation of the power to employ a common language. The beginning of the dispersal is represented in the lower planes of the design, and by the characterisation of the groups a clue is afforded to the history of the world.

Numerous as are the figures, they form three distinct divisions. In the centre, as if they were in correspondence with the spirit of NINUS, we have men and women of the race of CHAM, who represent systematic idolatry. The priest bearing the hideous idol is most honoured: so long as it is preserved all other losses are trivial. At one side is armed idolatry, at the other a sorceress. The girl who kisses the priestly robe and the men and women who follow are worthy companions in an enterprise which is to depend for existence on the degradation of man. This is suggested in a remarkable way by an omission. In every exodus, as in all military undertakings and engineering contracts on a large scale, ancient and modern, the first question must be, How is the multitude to be fed? The votaries of the middle group have made no provision that is apparent for future needs. As long as men are weak, organised idolatry can remain free from apprehension of dying out through want.

On the right are the children of the family of JAPHET, the hunters and warriors who seem by their turning towards the background as if they were destined to follow a course that if not retrograde was not to be marked by progress. The Bedouin of to-day resembles his ancestor who lived three thousand years ago.

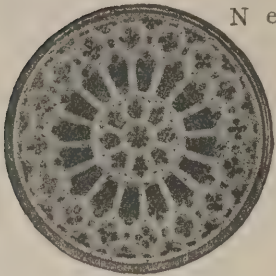
In the group on the left side we see civilisation in an early form, which is certain to expand. The family exists in its perfect form and the head of it serves as pastor or priest. The upward glance and the outstretched hands are signs of his devotion; a blessing is asked and bestowed. The son who already is competent to guide the wain and looks resolutely towards the future, who carries his crook like a sceptre, is destined to be a ruler; he may be another DAVID, shepherd, king and poet. That morality reigns among the group is evident, from the alarm which is excited by the proposals to join the idolatrous party. It is also plain that among this family the value of property is appreciated as a necessity for stability. It is not only flocks and herds have been reared, but enough capital in the form of provisions, at least, must have been accumulated to allow the mechanic arts to be practised. The difference between the woven robe of the patriarch and the raiments of skins which are seen among the hunters on the other side, may be taken as a test of the advance which the representatives of the principle of civilisation have attained. The package of household goods carefully made up, the distaff, the supply of grapes for the infants, are all signs of prudent domestic government. The noble mother, who leads as if she were the guardian of the family, is a prototype of "the valiant woman" described by the Wise Man:—"Quæsit lanam et linum, et operata est consilio manuum suarum."

KAULBACH has endeavoured to unite the figures in the different groups. It was probably with that intention alone he introduced the episode of the murder of the architect. There are precedents to warrant the supposition that Babel could not be destroyed without somebody believing that the designer was the real cause of the misfortune. KAULBACH could be sarcastic, and he suggests that the murderers were building workmen; he may have seen while decorating buildings enough disloyalty among men of that class to justify his selection.

KAULBACH'S paintings in the Berlin Museum have been engraved by Professors EICHENS and JACOBY in a style that reflects credit on the patriotism and love of national art of Herr DÜNCKER, the art publisher to the Imperial Court, by whom the commission was given. By his permission the illustration has been reduced from the first plate. The series is utilised in Germany, but as the subjects are of universal interest there is no reason why the plates should not be also turned to account in this country. As offering materials for thinking there are no modern works superior to KAULBACH'S. Herr DÜNCKER has produced illustrations of the paintings in other forms to meet all requirements.

A SCULPTURED HISTORY.

By H. P. BURKE DOWNING, A.R.I.B.A.



Rose window of N. Transept.

particular, to perceive how interesting and how well told.

Briefly, the sculptures over the great triple doorway represent the consummation of the Christian's hope—CHRIST enthroned in glory amidst His apostles and saints,

a subject not to be adequately handled in a general description. The figures standing in the highest places east and west of the great rose window, shown in my sketch of the north transept, are those of the four archangels, typical of the kingdom of God in Heaven; while the figures in the intermediate posi-

writing and translating he was engaged up to his very last hour.

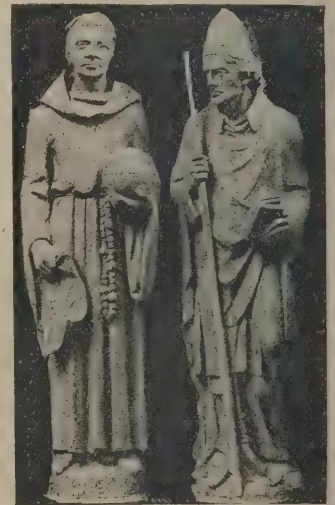
In St. AIDAN, who is joined with St. ALBAN, a British martyr before our Saxon forefathers had any knowledge of the island, is represented Celtic Christianity. The story of St. AIDAN, first Bishop of Lindisfarne, the see from which Durham traces its descent, tells us of the difficulties and dangers that opposed the first missionary efforts in Saxon England. OSWALD, king of the united kingdoms of Deira and Bernicia, having during the troubles of his early life had experience of the hospitality and friendship of the monks of Iona (an Irish settlement), and having himself become Christian, determines that his people too shall hear again of the true faith, from which, though it had once been planted amongst them by PAULINUS, they had fallen away. He applies to the monks of Iona to send him a missionary helper. The first messenger, CORMAN, the grave and learned, fails to convert the people, and on returning to Iona endeavours to dissuade any other from entering on the task. AIDAN, however, a young brother of the monastery, perceives that the fault has lain very much in the preacher's lack of sympathy with his hearers. His shrewd discovery of the fault points him out as the man to make the mission a success. He is consecrated to the work, and sent (A.D. 635). For seventeen years he toiled as Bishop of Northumbria, working side by side with the king, and establishing the Celtic



Bede. St. Paulinus.



Richard II. Anne of Bohemia. Henry V. Katherine of France.



Roger Bacon. Bishop Grosstete.



Abbot Ware. Abbot Littlington.



Matthew of Westminster. Caxton.

tions are representative of the course of English Church history and the individual history of the Abbey. It is to these I wish to confine myself for the present, and even of many of these I cannot do more than mention the names; an exhaustive treatment of the whole would necessarily be very extensive.

Representative of the early Latin and Greek learning imported into England with the Christian Church stand BEDE, the monk of Jarrow, and THEODORE OF TARSUS, Archbishop of Canterbury, whose work was the organisation of the ecclesiastical system in England. BEDE, whom I have selected for illustration, is represented with cowl and head studiously bent over a book, for his life was spent with books, and for the sake of learning he gave up the advancement that might have been his. With

Church where the Roman had failed to make a permanent footing. His fame is eclipsed by that of St. CUTHBERT, who held the see some fifty years later; but it was to the enterprise of the Irish monks of Iona and to AIDAN's untiring courage and zeal, that the establishment of the Christian Church in the North was due.

A short-lived Church had already been established in Northumbria by St. PAULINUS, who with St. AUGUSTINE represents in this historical procession the missionary enterprise of Rome in England. PAULINUS came to the North in about the year 627 A.D. with the Kentish bride of EDWIN OF NORTHUMBRIA, and all have read, either in the account of BEDE or in the well-known verses, of the incident which so strikingly shows the way in which the new faith appealed to the nobler minds among our heathen forefathers, as

holding out a hope concerning the future after our brief life here has been spent, that life which in the image of the Northumbrian Ealdorman is but as the flash of a sparrow through the fire-lit hall from darkness into darkness. PAULINUS did not long remain in Northumbria; the successes of PENDA, King of Mercia, and champion of the old faith, drove him to take refuge in Wessex, and the Roman Church in Northumbria died out.

St. DUNSTAN stands with St. BENEDICT as the representative of that vast system of monasticism which so quickly took root in the early English Church and so long endured.

incident of one of the fierce inroads of the Danes, as fierce and implacable as had been, several centuries before, those of our own Saxon forefathers upon the British. The leader of an invading Danish host sends word to King EDMUND demanding his submission. The reply of the King breathes the spirit of our oldest English poetry—he will never bow to the Dane till he turn Christian, “Nor,” says he, “will I that I live alone after my dear thegns, who have been foully slain by the Dane.” His constancy, however, proved only his destruction. The Dane, coming close on the steps of his messenger, King EDMUND is taken un-



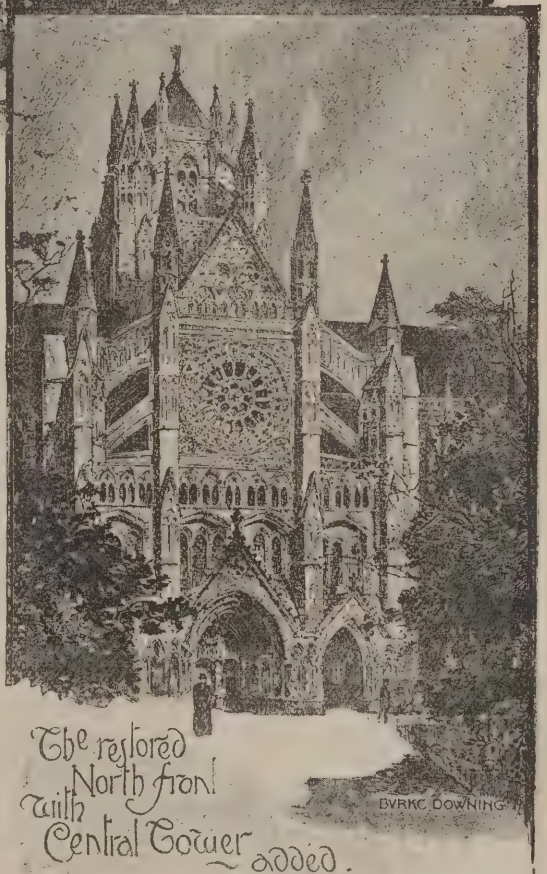
*The Abbey with
Central and Western
Towers and Spires.*

Westminster Abbey.

Conjectural Completion on the Lines of Henry III.'s Work.
By Mr. H. P. BURKE-DOWNING, A.R.I.B.A., F.S.I.

St. DUNSTAN's fame as an ecclesiastic, which is perhaps subordinate to his fame as a statesman, was in the character of an upholder of strict monastic institutions. The story of his life contains several miracles, but the most widespread piece of learning concerning him is that of his adventure with the Devil, who, in the form of a woman, visited him at Glastonbury, where he was abbot, in the smithy which he had set up “beside his cell, in order to have employment for his hands when for very weariness he was compelled to rest from his orisons.” The writer of the “Life of St. Dunstan” was struck with the humour of the incident of his tweaking the Devil's nose with the red-hot pincers, and ends up his account of it with the remark that the Devil “came no more thither to be cured of cold in the nose.” St. DUNSTAN's influence in his time as an ecclesiastical statesman was as great as that of St. THOMAS à BECKET and Cardinal WOLSEY in later years.

The martyrs of the early English Church are represented by St. EDMUND and St. BONIFACE. Our account of the death of St. EDMUND, King and Martyr, is derived from ÆLFRIC's “Lives of the Saints,” the author of that account claiming to have had his knowledge by a direct chain of descent from Archbishop DUNSTAN, who, in his early youth, heard it at the Court of King ÆTHELRED, from the lips of the aged sword-bearer of King EDMUND himself. It is an



*The restored
North front
with
Central Tower added.*

prepared, giving himself up, indeed, in hopes to save his companions, and suffers a death like that of St. SEBASTIAN. A pretty story is told of how a grey wolf guarded his head, which had been thrown by his murderers into the wood,

until his friends found it and buried it with the body, to which it became miraculously reunited. Over the place of his martyrdom and burial rose the famous Abbey of Bury St. Edmunds.

The figures of GROSTÈTE, Bishop of London, and ROGER BACON, his pupil, the famous Franciscan friar, are representative of the leaders of scientific inquiry which the Church, in spite of herself, sent forth in the Middle Ages.

Such are a few of the stories brought to mind by the representative sculptures of early English churchmen. Of the figures more immediately connected with the Abbey itself there is first MATTHEW OF WESTMINSTER, whose name sufficiently bears witness to the nature of his connection with the Abbey, and who stands to represent the old monkish chroniclers, who have preserved for us the records of our early national life. With him is CAXTON, whose printing press was set up in England in the Almonry of Westminster,

that the portico in front of the north entrance, which remained until the seventeenth century and was known as "Solomon's Porch," was built. The figure of RICHARD is taken from the celebrated portrait—a contemporary likeness—now in the sacarium.

The Abbots WARE and LITTLINGTON stand to represent the abbots under whom the structure of the Abbey was advanced. It was Abbot WARE who in 1267 brought back from Rome, whither he had gone for confirmation of his election, the mosaic pavement which remains in front of the altar, inscribed with his name. WARE also is known as the compiler of a book of the "Customs" of the monastery.

The work of LITTLINGTON was more extensive. It was under him (1362-86) that, with the benefaction of a predecessor of his, the present deanery was built, as well as the southern and western cloisters and many parts of the conventual buildings now no longer existing.



where he received royal visitors and from which the earliest printed books were issued.

Two abbots of the first foundation fill the next niche—WULSINUS and EDWIN—and then come two pairs of royal benefactors, RICHARD II., with his Queen ANNE OF BOHEMIA, and the martial HENRY V., the hero of Agincourt (for which victory a thanksgiving service was held in the Abbey), with KATHERINE OF FRANCE, his queen and ancestress of the Tudors. Much of the nave was built with grants from HENRY V.

Ill-fitted as was RICHARD II. for the business of government to which he was born, he was well qualified to be a patron of art. He always bore especial love and veneration for the Abbey, in which his coronation and marriage were celebrated with unusual splendour. It contains the tomb which was raised over his consort ANNE, and it was under him

Considering the long line of founders and benefactors, it is perhaps remarkable that, with constant additions, the structure has never yet been completed in the form which would no doubt have been given to it had HENRY III. completed the work which he began. I allude, of course, to the absence of the central tower, which I have no doubt, and on a former occasion have shown, would have formed a feature of the building of HENRY III., and which, as is witnessed by the structure itself, the Abbey as it stands was intended to have. The fact that it has square battlemented towers at the western end, instead of spires in character with the rest of the building, is of course due to the fact that the style of a later period was followed, but the provision for a central tower is undoubtedly in accordance with the design of its first founder, and the want of it might yet be repaired.

TESSERÆ.**Belfry Turrets.**

BELFRY turrets are usually placed in the south-west, more rarely in the north-west, angle of towers; they occur also in the south-east and north-east. They are polygonal, and project half externally and half internally, and have a small doorway opening into the inside. They are carried up either to the height of one or two stages, or to the belfry windows, and then weathered off with a bold and picturesque slope, or they rise above the weathercock or other pointed termination. Very frequently they are lost in the buttresses, which are, as it were, thrust prominently outwards by a bulging swell of the masonry in one angle, readily distinguished from the rest by its visible protuberance, and by small slits to admit light and air into the staircase within. Sometimes, as at All Saints, Paston, near Peterborough, the head of the turret merges into a broach of the spire, which gives an extremely bold and irregular effect. There can be no doubt that irregularity gives effect to a tower, or indeed to any Gothic building. Not irregularity for irregularity's sake—that becomes affectation. But such irregularity as arises from the absence of hypocrisy, or show, or making one side the same as the other, or the like. There is no need to fear a broken or shapeless mass as the result; uniformity is far less pleasing than variety; and the eye can never be offended in Gothic buildings by a door, a window, or a buttress being fairly pushed aside by the intervention of any necessary constructive feature. Nothing was more fully felt by the ancient architects. In very elaborate and splendid towers one belfry window is sometimes placed on one side instead of in the middle, even though the belfry staircase which caused this remarkable irregularity was scarcely visible on the outside. Examples of this are St. John, Ryhall, and All Saints, Oakham, in Rutland. Sometimes, as at St. Wulfran, Grantham, the splendid Decorated tower of which has scarcely a rival in the kingdom, one of four pinnacles is considerably larger and higher than the other three, because it forms a capping to a staircase turret. Yet who shall be bold to say this is a fault? By all means break up monotony and sameness of sides by some such expedient, and a belfry turret seems most admirably adapted to produce almost any kind of bold picturesque effect. From a distance the lights and shadows, the peaks and the broken lines, are vastly imposing and arresting to the eye. On a near view the bold abutment of an angle seems at once to flank and to prop the stages of a lofty tower, and on every point whence the effect is visible, the mind is gratified by the idea of ingenuity or pleased by the suggestion of necessity made subservient to decorative effect. Some belfry turrets are corbelled off a little above the ground externally. This, though not a material difference of construction, is to be deprecated, because the tower is apt to appear overbalanced by an excrescence which emerges from the wall itself, and does not rest upon its own basis on the ground. In St. Peter, Barton, near Cambridge, the south-west angle is singularly prolonged into a wedge-like form from the internal formation of a belfry tower, and sometimes the most beautiful forms and enlargements of buttresses are used to give scope for the staircase. It is true that many ancient towers were ascended by ladders, and in a few are to be seen wooden stairs enclosed in wattled or boarded turrets constructed in the interior. The ascent to the floor on which the bell-ringers assemble, if above the ground, should be the belfry turret, though the entrance to it should never be from without, independently of any other communication with the interior of the church.

Metal Working in Nuremberg.

When the beautiful well (the *Schöne Brunnen*) in Nuremberg, which was among the earliest of the great works in iron, was enclosed two centuries and a quarter after its erection with the high railing still standing, by Paul Köhn in 1586, he invented a device which highly pleased the Nurembergers—the insertion of loose iron rings set in the transverse bars, a treatment of which only welded metal is capable, and which was unanimously declared to be a sign of the Nuremberg workmanship. The date of the erection of the *Schöne Brunnen* is 1355 to 1361, and there yet remain many other productions of the same master, Schonhofer, who designed this remarkable work, figures not only in iron but in stone, commemorative of the Blessed Virgin and patron Saints attached to the private houses. Originally the figures, crockets, pinnacles, &c., were painted and gilt, as indeed every production of the fine arts in the world has been, more or less, until the Renaissance superseded native architecture, and the bleached remains of the ancients were set up in place of the living and breathing, although less perfect, works of the day. From the time of Schonhofer, with whom was associated Fritz Rupprecht in his principal work, there was a succession of skilful artists, some of them undertaking work indifferently in iron, stone or wood, assisted in the same manner by others more exclusively devoted

to the particular material required. This mode of working in brotherly harmony was assisted by the establishment of guilds and companies strictly regulating and limiting the practice of crafts and mysteries. Every art had its guild, even poetry, and some of the restrictions and penalties in the power of those societies remain in force at the present day. Thus, Adam Kraft in his old age was accustomed to rely on the assistance of his brethren in trade, Peter Vischer and the coppersmith Sebastian Lindenast, who designed for him the decorations on festival days and other matters. We also learn that the five sons of Peter Vischer (the greatest master in metal Nuremberg has produced) assisted their father in the shrine of St. Sebald. "This Peter," says Neudörfer, "was of manly and friendly speech, and as a layman may say, skilled in natural science. He was also much esteemed by great men, so when a prince or potentate came to Nuremberg, he seldom left without visiting the foundry." The father of Peter was also a coppersmith, and Rettberg says the wonderful works of the Viscchers were demanded far and wide. The statuette which this noble old Nuremberger made of himself on the shrine of St. Sebald shows us the workman in his close cap and ample leather apron, chisel in hand, "the simple coppersmith who would make plain candlesticks for household use, as well as raise the shrine to the honour of the heavenly prince; a handy-craftsman like many others, but one so learned and skilful that princes delighted to visit him, and the after-world has willingly placed him among great artists." Vischer's five sons died one after another in their prime, and their remaining works are supposed to be few; but the young kinsman of the patriarch, Pankraz Labenwolf, worthily transmitted his genius to the next generation. To him belongs the fountain in the court of the Rathhaus, and that in the Goose Market, surmounted by a bronze countryman carrying a goose under each arm, a figure that the carvers in wood are still very fond of reproducing for the chimneypiece. Another eminent name, that of Sebastian Lindenast, is particularly associated with locksmith work and clockmaking. From 1462 to 1520 he continued, says Rettberg, the exertion of his talents, and as the style prevailing in the great majority of the decorations on the doors and gates of the city identifies them with this period, perhaps we should not be far wrong to give him the honour of nearly their entire production.

Savonarola's Influence on Painting.

The naturalistic state into which art had fallen in Florence at the time of Lorenzo de Medici can in no better manner be ascertained than from the active part taken by the great moralist and reformer, the Dominican monk, Savonarola, to repress it. Included by him in the category of pagan and sensual manifestations which the revival of letters, and the consequent pedantry exhibited in the attempts at the reproduction of classic taste in literature, had awakened in the art-displays of his day, they had their full share in those stern denunciations in his well-known Lenten Sermons, in which no individual, from the prince to the peasant, and no occupation, from that of the podestà to the painter, were spared. The great reformer aimed at the extinction of the prevailing and absorbing naturalisms, and the effects of the reasonings of the schools of cold philosophy which the study of ancient classic writers had introduced. He lamented in no measured terms that so much materialism had virtually suppressed spirituality and religious zeal in art. His influence on the fine arts was designed to overcome the precise misdirection of view that then generally existed, and which his powerful eloquence only stayed for a few years. Some of the most celebrated Florentine artists of his day were roused from their materialistic stupor by his exhortations to a sense of the indifference into which they had allowed their art to subside. Many of them at once reformed their practices. Some even abandoned the pursuit of art altogether, and sought refuge in the cloister. The following quotation from one of the sermons of this distinguished preacher, given by Marchese and Rio, will show how he contended against one of those mistakes in the practices of imitation. It will be seen how little importance he, a man learned no less in the writings of the ancient pagan than in the modern ecclesiastical authors, attached to the imitative or naturalistic rendering of specific fact when applied to elevated themes. Thus he speaks to the artists in Florence:—"Your ideas are stamped with the grossest materialism. The beauty of things composed consists in the proportion of their parts or the harmony of their colours; but in that which is simple, beauty is transfiguration—it is light. It is, then, in something beyond the visible that we must seek for the essence of supreme beauty. The more nearly the creature participates in and approaches to the divine beauty the more beautiful it is, because the beauty of the body depends in great measure on the beauty of the soul. For instance, if you select two women of equal beauty from among this audience, she who possesses the greatest holiness will excite the greatest admiration in the spectators, and the palm will even be awarded to her by men of carnal minds." The naturalistic views which succeeded the spiritual, and the classic and other tastes of which the history

of the times has thus explained to us the reason, are tendencies evidenced by masters no less eminent than Michel Angelo, and seen in the lower part of his *Last Judgment* and ceiling of the Sistine, and also by Raphael in some of the frescoes of the Vatican, and were at no distant period destined to be misapprehended and exaggerated by scholars and imitators, so as ultimately to lead to the superseding of the religious element and to become the pretext in the ornamentation of ceilings and walls for the manufacture of allegory and the mechanism of the decorator, and are among the reasons of the heartless and uninteresting displays of the end of the sixteenth and first half of the seventeenth century in Italy.

Geology and Building.

If we look to the early history of the most ancient nations we find that the art of building has attended the first advance of civilisation, and the use of worked stone has succeeded to caves in rocks and the rude wicker or earthwork of their common and early structures, but the conversion of stone to the increasing artificial wants of society was necessarily consequent on the advance of the mechanical arts before it could be shaped and applied. How interesting are the first though rude efforts displaying practical geology. The bold and noble monuments of the early ages show the natural vigour of the human mind untutored in the mechanical skill and art of later times. The stupendous monolithical structures and those early sepulchral monuments known as cromlechs, cairns and moats, which abound throughout western Europe, were doubtless the work of a people who, taking nature for their guide, by prodigious labour raised and put together and frequently conveyed to great distances for the erection of their monuments the immense stones which, detached from their native beds, were distributed over the surface of the country. Most of those stones are of the primary and crystalline class of rocks, which from their hardness have resisted the violence of that disturbing power which removed them from their mass and afford us a good knowledge of their enduring quality. Moreover, the originality and boldness of their application resulted from minds familiar with nature's works and untaught in the arts which in after ages accomplished by skill and the use of smaller-sized materials what the early ages unskilled in building could alone express by the magnitude of the stones. Let us consider the more advanced history of the principal nations of the earth, and we shall find that geology has received great consideration. The architects and sculptors of Greece and Rome knew the qualities of their materials, and if we may judge from ancient writers and existing remains, gave considerable attention to them, abounding as those countries did in good materials. In the writings of Vitruvius on Roman architecture the most particular rules are laid down with regard to the selection and use of building stones and the cements employed with them. How important are the results of their influence on society. If Egypt, Greece and Rome had had their principal structures of a perishable material, what would we not have lost? What interest would we now feel in those countries, or how could we have derived the great advantages which have flowed from them? Good materials and a right knowledge in using them have, however, produced a different result, and again, what do not those countries owe to the durability of their structures, conceived as they have been in a noble spirit? Without them Rome of the present day would be unvisited by the countless thousands whose wealth now enriches her; without her buildings the classic shores of Greece would gain less of European sympathy; nor would the dusky inhabitants of Egypt occupy such interesting ground but from the remains of the stupendous and imperishable monuments of her past history. Our own kingdom also possesses proud memorials in the enduring monuments of the Middle Ages. Those connecting links with the past and present afford us noble examples of the religious zeal and skill of our forefathers, whilst the perseverance which has been displayed in accomplishing their erection is much calculated to stimulate us to bold designs. These indelible landmarks of his early home the traveller finds deeply implanted in his mind, and it is difficult for us to estimate their effect on society in the attachment they cause to our laws and institutions. Nor do those venerated and bold structures fail to excite a powerful feeling in the inhabitants of the New World, who, though born in a distant land, contemplate with pride and fervent admiration the works of their progenitors. But the edifices of centuries past, many of which, even in their dismantled state, have withstood the destructive violence of the elements, will yet outlive very many of the most costly structures of the present day, and until a very recent period so comparatively few were the buildings calculated to endure to any distant period that future ages, judging by our public structures, will look upon the people of the present time as a degenerated race, and in the erections of centuries back will contemplate the finest and most durable monuments of architectural skill.

THE ENTRANCE EXAMINATION AT THE ECOLE DES BEAUX-ARTS.

IN the *Architectural Record* (New York), Mr. Ernest Flagg gives the following graphic description of the preliminary examination he underwent prior to admission as an architectural student in the Ecole des Beaux-Arts:—

The school is free, supported by the Government. The appliances gathered here for a training in art are such as only a nation like France could accumulate in centuries, and such as is not found elsewhere in the world. The reputation of the school is such that there is no second. Naturally admission to it is eagerly sought, but alas! there are barriers to be surmounted before one can enter. The Government has no intention of wasting the public funds on unpromising aspirants. The examinations take place twice in each year, in the months of March and July. Between two and three hundred apply, and only about one-eighth of that number are received. Recently the number of admissions was limited to thirty. The examinations consist of architectural composition, modelling in clay, drawing from cast, descriptive geometry, plane and solid geometry, algebra, arithmetic and history. The first three are called "admissibles." If these are not successfully passed, one is debarred from taking the others. Perhaps the best way to give a clear idea of this trying ordeal will be to describe my own experience.

Having secured a letter of introduction from the United States Minister, which is necessary, I presented myself at the school and was enrolled on the list of aspirants for the next examination. Before nine o'clock on the appointed day I found myself, with about two hundred others, in the "Cour des Loges," armed with drawing-board, T-squares, triangles and drawing instruments. Monsieur Barbier, chief guardian, "Département d'Architecture," resplendent in his uniform and cocked hat, mounts the steps, orders one of his lieutenants to lock the gate to the court, then, to make matters perfectly fair, he takes a small dictionary from his pocket, opens it in the middle and selects the letter which first meets his eye, from which to begin the roll. Naturally the roll generally commences at about the middle of the alphabet. Then follows an interminable list of names. Each one, as he is called, enters and signs a register. I, who know no French, strain my ears for something which resembles my name, with the result that I bring up the rear amid a volley of what I take to be French profanity from Monsieur Barbier, who has to correct his register, and who has no great love for "les étrangers" under any circumstances. I mount five flights of stairs and find myself in a room about thirty feet wide, but of tremendous length. At the door I am handed a programme, an imposing document lithographed on a large sheet. Along the room on either side extends a row of stalls, for all the world like those of a stable; these are called "loges." In the centre are long tables. Each loge has a shelf, which for one to work on, and a small window. The first to arrive occupy the stalls; those who come later must content themselves with the tables, where the light is very bad. One is free to walk about as he pleases and to make all the noise he cares to, and each individual of the two hundred or more present is availing himself of these privileges to the utmost.

Many present are old hands who have tried the examinations before, without success, and feel at home. Some even have the hardihood to propose an initiation of the newcomers (*réception des nouveaux*). It is now about eleven o'clock and time for *déjeuner* or breakfast. I notice a great many issuing from a door half-way down the room with eatables, and upon investigation I find it leads to a sort of kitchen where bread, sandwiches, coffee and wine can be bought, the latter at 7 cents a bottle. The whole company are now regaling themselves at the tables, which presently literally flow with wine and coffee. Suddenly there is a great crash and shouts. Some one has knocked the legs from under one of the tables. Bottles, plates, &c., fall in a heap on the tiles. This is too much even for the uniformed guardian, who has thus far been standing stoically with his hands behind his back near the door, and his voice is now added to the general uproar.

Déjeuner over, the tables righted and the wine mopped up, work finally begins. Most of those present repair to the stalls and scrutinise the programme. There is an immense amount of visiting from one stall to another in search of ideas from those supposed to be strong (*les types forts*), but the room is comparatively quiet, with only an occasional cry of "Vive Boulanger!" cat-calls, and songs from various quarters. The programme calls for a little "portique," to form a point of view from a château, and to serve as a shelter for eight statues, owned by the proprietor, the building to be erected upon terraces in which can be arranged grottoes, &c. The greatest dimension is given, also the scale at which the plan, section and elevation are to be drawn; a detail of the order must be made at a larger scale. The time allowed is nominally twelve hours, but as the various preliminaries described above occupy

so much time, and as the guardians are in a great hurry to go home to their dinner, the actual time which one can work is only a little over eight hours. I work as I never worked before, but, do my best, the light begins to fade before I have washed in the shadows on the elevation. I had been warned to take candles, and provided myself with six; taking possession of one of the now deserted loges, I rashly proceed to light them all, but it is not long before I discover my mistake. Some one passing gives a whoop, and in a moment half of those left are gathered in front of the loge shouting, "Quelle illumination! oh, yes! oh, yes! * mon dieu! quelle illumination!" I think I am going to be mobbed by the dancing crowd, and it is some time before the excitement sufficiently subsides for me to resume work.

The next day and in the same place follows the examination in modelling in clay. Each student is required to bring his own clay and tools, and woe betide the unlucky aspirant who is not informed. In each loge is a plaster cast of a piece of ornament, all exactly alike. Eight hours are allowed to reproduce it in clay. This day the tables have disappeared from the centre of the room, and in their place at intervals are piles of sawdust and pails of water—the water to wash the clay from the hands and the sawdust to take the place of towels. The next day the examination of drawing from the antique completes the admissibles. For this, like the modelling, eight hours are allowed. The students are distributed in the various hemicycles and *déjeuner* is not a feature of the *séance*. On the wall of the room I am in is a clock which strikes the quarters, and every time it strikes a deep groan resounds from every throat, but otherwise there is no noise.

Great is the excitement at the posting of the names of those who have passed, and great is my joy to find mine among them. I am now permitted to take the examinations in mathematics and history, but as I know scarcely a word of French I present myself simply for the form, that being necessary in order that I may not have to undergo the admissibles next time. By the time the next examinations came around I had accumulated a limited store of bad French, and had time to brush up, indeed to polish, my acquaintance with algebra, geometry (plain, solid and descriptive), and to lay in a goodly store of history. Each of these examinations is both oral and written. Only one question in each subject is asked, and failure means half a year's wait. The first examination was in written history, and the question, as nearly as I can remember it, was as follows:—

"It is proposed to erect a monument to the writers of the eighteenth century. Give a brief description of the design; the monument should be adorned with statues of authors and have upon it suitable inscriptions. What names should be so honoured, and which should receive places of the greatest distinction? Give an account of the principal works of the various authors, also a short account of literature of this epoch."

The examination was held in the beautiful hemicycle of Paul Delaroche, and from my place of vantage on one of the upper tiers I could see a great deal of cribbing going on below. The first care of the guardian was to make a map of the room, showing the location of each pupil. This to aid the professor in the detection of frauds. If two papers are found to be suspiciously alike, he looks up the location of the men; if near each other he determines at the oral examination which one has cheated. Once detected in a fraud, that young man had better choose some other occupation in life than architecture, for he will find it extremely difficult, if not impossible, to ever enter the school.

The oral examinations in history are held in the same place. A printed list of questions is furnished upon application. They embrace about fifty epochs of history, art and literature. The subjects are chiefly classical and French. The United States is honoured by two questions. The questions concerning the English relate exclusively to the driving them out of France by Jeanne d'Arc and Duguesclin.

The professor of history conducts the oral examination in person; he is the only professor with whom the candidate for admission is brought in contact during the examinations, and the impression he produces is most agreeable. He sits in state on the rostrum. Before him on the table is his hat containing slips of paper, each with a number corresponding to a question. The student, when his name is called, advances to the table and draws a number from the hat. The professor opens it and tells him the subject he is to discourse upon. While I am waiting, a young man draws the American War of Independence. His ideas on the subject are somewhat misty. He knows of only two of its heroes, Washington and Franklin. The professor does not like his pronunciation of "Washington," and says those Americans over there, indicating myself and some of my compatriots, are laughing at him. He says you should try to get the true American pronunciation of the word, then repeats very distinctly for his edification Vash-ish-ton, with strong emphasis on the last syllable, and an almost imperceptible sound of the final *n*.

My turn comes and I draw literature of the time of Louis XIV. I soon get myself in trouble by making an odious comparison, having the hardihood to rank Molière below Shakespeare as a playwright. Monsieur smiles, shrugs his shoulders and asks me if I am English. I answer American. He says perhaps it is natural for me to take that view, but he evidently pities my ignorance. However, Monsieur La Monier is a gentleman, a man of distinguished learning, and my beau idéal of a Frenchman.

The written examinations in descriptive geometry and other mathematics are conducted on the same plan. The students are not allowed to communicate. I hear several things which sound strange to an American. One young man was told to move along, the inspector explaining that he might copy from his neighbour if he sat where he was. Another at the oral examination wished to show the "examineur" some problems in descriptive geometry which he had worked out. The examineur politely refused to look at them, saying, "Some one else may have done them for you." At the written mathematical examination was an American newly arrived, who knew absolutely no French. The inspector remarked that he did not write as he read the programme and asked him why. "Oui, oui," said the young man, this being his whole vocabulary. A moment later, noticing that he still did not write, he asked if he understood French. "Oui, oui," he replied. Again he did not write, and the inspector said, "You do not write. Why do you say, 'Oui, oui,' whenever I speak to you?" My compatriot gravely replied, "Oui, oui, oui," amid shouts of laughter. It is slow work waiting one's turn at the orals. Monsieur Salisis, the official examineur, is an old sea captain, with a bald head, which he wrinkles when he is not pleased, and he is seldom pleased during the examinations, but he has an unlimited supply of patience; it cannot be denied, he gives the men every chance. A student is at the board hopelessly perplexed; the old man gets up and says, "I will return in a few minutes; meantime you will have a chance to reflect." Hardly is the door closed when at least fifty of those present begin to give advice to the bewildered victim at the board and tell him how to do the problem. The examineur returns, and the poor fellow is more at sea than ever. "Je vous remercie," politely says Monsieur, as he writes zero opposite your name.

It is now half-past six of a Saturday afternoon. I have been sitting all day on a wooden bench with no back. The French Government does not pamper the pupils at the national school with luxuries. Monsieur Salisis shuts up his note-book and announces that the examinations will be resumed at seven o'clock to-morrow (Sunday) morning, and I realise that I am in a foreign land.

Finally the F's are reached. I momentarily expect to be called. The last man has failed, and the following one will be asked to do the same problem. That is a habit of Monsieur, and I am anxious for the chance. No, it is Monsieur Flacet. "Do you present yourself seriously?" asks the examineur. "This is the seventh time, and I don't believe you know any more now than you did the last time. 'Prenez un point, et un plan. Trouvez la distance entre ce point et la plan.'" This Monsieur is quickly thanked. Evidently he is not worth wasting much time upon, and my turn comes. I am told that I write very poor French, and I am asked where I came from. I say "America." "Amérique du nord ou Amérique du sud?" asks Monsieur. I reply, my dignity somewhat injured, "Lés États Unis." "Bien," he says, and adds, "if I had been in America as long as you have been in France I could have spoken English a great deal better than you speak French." But as he has no means of knowing how long I have been in France, I mentally do not assent.

At each of these examinations a certain mark is given, ranging from zero to twenty. Then the mark received in each subject is multiplied by a co-efficient supposed to represent its relative importance; thus the mark in architectural composition is multiplied by 12, drawing by 2, modelling by 2, mathematics by 5, descriptive geometry by 5, and history being 1.

Failure to pass in a single subject debars the candidate. The names of those who are received are posted in the order of merit, ascertained as described, and here at the threshold begins the system of competition which pervades every branch of instruction at the school—a system which puts the men on their mettle, and produces the most extraordinary results, both as regards quality and the amount of work accomplished.

Having successfully passed the examination, notwithstanding my bad French, I find my name posted along with twenty-nine others, all that remain of the army of nearly three hundred.

Once having gained admission the student is allowed an extraordinary degree of liberty. He may stay in the school until thirty years of age provided he accomplishes work each year which may easily be done in one or two months. He may choose his own professor in architecture, and may work or not as he feels disposed. To keep his name on the rolls he is compelled only to visit the school twice in the year. His advancement is solely by the honours, or values as they are

* A term of derision applied to Americans and English.

called, which he obtains. The school is divided into two classes, first and second, the latter being the lower. When a student has obtained the required number of honourable mentions or values, he is admitted without further ceremony to the first class. When he receives the proper number there he is allowed to choose a final programme of his own making for a building, after which he receives his diploma from the Government and becomes a full-fledged architect. If a young man is bright, he may expect to reach this goal in from eight to ten years after entry, but a large proportion fall out before the course is ended. Thus far no American has ever finished the course, though several have reached the first class.

LINE DRAWINGS FOR ILLUSTRATIONS.*

IT cannot be sufficiently borne in mind—I am speaking now to students who are not intimate with the subject—that to produce with pure black lines the quality and effect of lines in which there is some gradation of tone is no easy matter, especially to those accustomed to the wood engraver as the interpreter of their work. Sir John Tenniel, Mr. Du Maurier, and Mr. Sambourne, not to mention others on the *Punch* staff, have been accustomed for many years to draw for wood engraving and would probably still prefer this method to any other.

But the young illustrator has to learn the newer methods, and how to get his effects through direct photo-engraving. What may be done by the latter is sufficiently demonstrated in the line drawings which appear in our newspapers, magazines and books; I speak of those which are well printed and on good paper. Many German and French periodicals teach us what to admire and what to avoid. I am referring only to line drawing in this lecture, because it is the only process in relief which may be said to give any certain results, leaving the consideration of other developments of process work until next week. Line drawings are now reproduced on zinc blocks fitted for the type press at a cost of less than sixpence the square inch for large blocks. The first condition for this process is to draw in pure black lines on Bristol board, or smooth white paper.

Let us glance first at the ordinary handbook teaching, and see how far it is useful to the illustrator of to-day. The rules laid down as to the methods of line work, the direction of lines for the expression of certain textures, "cross-hatching," &c., are, if followed too closely, apt to lead to hardness and mannerism in the young artist, which he will with difficulty shake off. On these points Mr. Robertson, the well-known painter and etcher, writing seven years ago, says well:—"The mental properties of every line drawn with pen and ink should be original. . . . This strong point is sure to be attained unconsciously if an artist's work is simple and sincere, and not the imitation of another man's style."

"When the question arises as to what examples a beginner should copy who wishes to practise the art of pen-and-ink drawing, the difficulty will be to select from the great and varied stores of material that are everywhere to his hand. All steel and copperplate engravings that have been executed in line and all wood engravings are within the possible range of pen-and-ink drawing. I hold, however, that much time should not be occupied in the imitative copying of prints: only, indeed, so much as enables the student to learn with what arrangement of lines the different textures and qualities of objects may be best rendered."

There are, roughly, two methods of obtaining effect with a pen—one by few lines, laid slowly; and the other by many lines, drawn with rapidity. If the intention is to see what effect may be obtained with comparatively few lines deliberately drawn, we may refer to the woodcuts after Albert Dürer and Holbein, and the line engraving of Marc Antonio. The engraved plates by Dürer furnish excellent examples of work, with more and finer lines than his woodcuts. "Some of the etchings of Rembrandt are examples of what may be fairly reproduced in pen and ink, but in them we find the effect to depend upon innumerable lines in all directions. In the matter of landscape the etched plates by Claude and Ruysdael are good examples for study, and in animal life we may refer to those of Paul Potter and Dujardin."

Thus for style, for mastery of effect and management of line, we must go back to the old masters, to work produced generally in a reposeful life, to which the younger generation are strangers. But the mere copying of other men's lines is of little avail without mastering the principles of the art of line drawing. The skilful copies, the facsimiles of engravings and etchings drawn in pen and ink, which are the admiration of the young artist's friends, are of little or no value in deciding the aptitude of the student. The following words are worth placing on the walls of every art school:—"Proficiency in

copying engravings in facsimile, far from suggesting promise or distinction in the profession of art, plainly marks a tendency to mechanical pursuits, and is not likely to be acquired by anyone with much instinctive feeling for the arts of design."

There is much truth and insight in this remark.

In line work, as now understood, we are going back, in a measure, to the point of view of the missal-writer and the illuminator, who, with no thought of the possibilities of reproduction, produced many of his decorative pages by management of line alone (I am speaking of the parts of his work in which colour was not employed). No amount of patience, thought, and labour was spared for this one copy. What would he have said if told that in centuries to come this line work would be revived in its integrity, with the possibility of the artist's own lines being reproduced 100,000 times, at the rate of several thousand an hour? And what would he have thought if told that out of thousands of students in centuries to come, a few, a very few only, could produce a decorative page; and that few could be brought to realise that a work which was to be repeated, say a thousand times, was worthy as much attention as his ancestors gave to a single copy?

On the principle that "everything worth doing is worth doing well," and on the assumption that the processes in common use—I purposely omit mention of the olden systems of drawing on transfer paper, and drawing on waxed plates, without the aid of photography; also of photo-lithography; these have been dealt with in previous papers—are worth all the care and artistic knowledge which can be bestowed upon them, we would press, upon your artist especially, the importance of study and experiment in this direction. As there is no question that the "handwork of the artist" can be seen more clearly through mechanical engraving than through wood engraving, it behoves him to do his best. And as we are substituting process blocks for wood engraving in every direction, so we should take over some of the patience and care which were formerly given to book illustrations.

We cannot live, easily, in the cloistered silence of the past, but we can emulate the deliberate and thoughtful work of Mantegna, of Holbein, of Albert Dürer and the great men of the past, who, if they were alive to-day would undoubtedly have preferred drawing for process to the labour of etching and engraving; and, if their work was to be reproduced by others, they would have perceived, what it does not require much insight in us to realise, that the individuality of the artist is better preserved by making his own lines than by those of the engraver. To do this successfully in these days the artist must give his best and most deliberate (instead of his hurried and careless) drawings to the processes; founding his style to a limited extent, it may be, on the work of the old engravers, but preserving his own individuality.

But we must not slavishly copy sketches by the old masters, which were never intended for reproduction. We may learn from the study of them the power of line to express character, action and effect; we may learn composition sometimes, but not often, in a sketch.

As to copying the work of living artists it should be remembered that the manner and the method of a line drawing is each artist's property, and the repetition of it by others is injurious to him. It would be an easy method indeed if the young artist, fresh from the schools, could, in a few weeks, imitate the mannerism, say of Sir John Gilbert, whose style is founded upon the labour of fifty years. There is no such royal road.

But for the illustrator by profession there seems no artistic leisure in 1893, no time to do anything properly in this connection.

"It is a poor career, Blackburn," said a well-known newspaper illustrator to me lately (an artist of distinction and success in his profession who has practised it for twenty years), "you seldom give satisfaction—not even to yourself."

"It is an ideal career," says another, a younger man, who is content with the more slap-dash methods in vogue to-day, and with the income he receives for them.

There is another point to notice. The education of the illustrator in these days means much more than mere art training. The tendency of editors of magazines and newspapers is to employ those who can write as well as draw. This may not be a very hopeful sign from an art point of view, but it is a condition of things which we have to face.

In sketches of society the education and standing of the artist has much to do with his success. Mr. Du Maurier's work in *Punch* may be taken as an example of what I mean, combining excellent art with knowledge of society. His clever followers and imitators lack something which cannot be learned in an art school.

Much as we may desire to see a good artist and a good *raconteur* in one man, the combination will always be rare; and those editors who seek for it are often tempted to accept inferior art for the sake of the story. I mention this as one of the influences affecting the quality of illustrations of an ephemeral or topical kind, which should not be overlooked.

* From the Cantor Lecture (1) by Mr. Henry Blackburn, delivered before the Society of Arts.

It should be borne in mind that in drawing for reproduction by any of the mechanical processes (either in wash or in line, but especially the latter), there is more strain on the artist than when his work was engraved on wood, and the knowledge of this has left process-drawing principally in the hands of the younger men. They will be older by the end of the century, but not as old then as some of our best and experienced illustrators who keep to wood engraving.

I am touching now upon a difficult and delicate part of the subject and must endeavour to make my meaning clear. The illustrations in *Punch* have, until lately, all been engraved on wood (the elder artists on the staff not taking kindly to the processes), and the style and manner of line we see in its pages is due in great measure to the influence of the wood engraver.*

This refers to facsimile work, but the engraver, as we know, also interprets wash into clean lines, helps out the timid and often unsteady draughtsman, and in little matters puts his drawing right.

Now the wood engraver was apprenticed to his art and, after long and laborious teaching, mastered the mechanical difficulties. If he had the artistic sense he soon developed into a master-engraver and illustrator, and from crude and often weak and inartistic drawings he produced illustrations full of tone, quality and beauty. (He does so still to a limited extent, as many an author knows.)

From very slight material handed to him from a publisher the wood engraver would evolve (from his inner consciousness, so to speak) an elaborate and graceful series of illustrations, drawn on the wood block by artists in his own employ, who had special training, and knew exactly how to produce the effects required. The system often involved much care and research for details of costume, architecture and the like, and if not very high art, was at least well paid for, and appreciated by the public. I am speaking of the average illustrated book, say, of twenty years ago, when it was not an uncommon thing to spend 500*l.* or 600*l.* on the engravings of a book. Let us hope that the highest kind of wood engraving will always find a home in England.

I do not think the modern illustrator realises how much depends upon him in taking the place, so to speak, of the wood engraver. But the interpreting of tone into line fitted for the type press, to which the wood engraver gave a lifetime, will develop more and more upon him. We cannot keep this too continually in mind, for, in spite of the limitations in mechanically-produced blocks (as compared with wood engraving) in obtaining delicate effects of tone in line, much can be done in this direction in which the engraver has no part. That it is possible, by the common processes, to obtain effects almost equal to wood engraving may be seen in the illustrations to Mr. Andrew Lang's "Blue Poetry Book," by Mr. Lancelot Speed, in which many technical experiments have been made, including the free use of white lining by process. But more notable, from an art point of view, are the illustrations, produced lately at the Birmingham Municipal School of Art, by process-drawing, one of which I will show you on the screen.

All this, you will observe, points to the higher use of the process block than is generally allowed, to something, in short, very different to the thin, sketchy outlines and scribbles which are considered the proper functions of the "pen-and-ink artist."

But "the values" are scarcely ever considered in this connection. Mr. Hamerton makes a curious error in his "Graphic Arts," where he advocates the use of the "black blot in pen drawing," arguing that as we use liberally white paper to express air and various degrees of light, so we may use masses of solid black to represent many gradations of darkness. A little reflection will convince anyone that this is no argument at all.

The ideal illustration by mechanical means is where the principles of line engraving are followed to the utmost limits of pen-and-ink drawing, where the lines of the drawing do not intrude upon the effect—a drawing which can be reproduced with the least touching or "rouletting" on the block, and which requires the least "overlying" and "making ready" on the part of the printer.

Mr. Ruskin's advice in his "Elements of Drawing," as to how to lay flat tints by means of pure black lines (although written many years ago, and before mechanical processes of reproduction were in vogue), is singularly applicable and useful to the student of to-day, especially where he reminds him that "if you cannot gradate well with pure black lines, you will never do so with pale ones."

To "gradate well with pure black lines" is, so to speak, the whole art and mystery of drawing for the photo-zinc process, of which one London firm alone turns out more than a thousand blocks a week.

As to the amount of reduction that a drawing will bear with

advantage in reproduction it cannot be sufficiently widely known that, in spite of rules laid down, there is no rule about it.

Mr. Emery Walker, of the firm of Walker & Boutall, who has had great experience in the reproduction of illustrations and designs from the old books and manuscripts, will tell you that very often there is no reduction of the original; and he will show reproductions in photo-relief of engravings and drawings of the same size as the originals, the character of the paper, and the colour of the printing also, so closely imitated, that experts can hardly distinguish one from the other.

On the other hand the value of reduction, for certain styles of drawing especially, can hardly be over estimated. On these walls next Monday you may see drawings reduced to one-sixteenth the area of the original, some even more, and results obtained which could be achieved by no other means.

Again I say "there is no rule about it." In the course of years, and in the reduction to various scales of thousands of drawings by different artists, to print at the type press, my experience is that every drawing has its scale, to which it is best reduced.

A word as to sketching in line from life ready for reproduction on a process block. The system is, I know, followed by a few illustrators for newspapers (whose names might easily be mentioned), who, by incessant practice, have become proficient. They have special ability for this kind of work, and their manner and style is their capital and attraction.

But to attempt to teach rapid sketching in pen and ink is beginning at the wrong end, and is fatal to good art; it is like teaching the principle of pyrotechnics while fireworks are going off. And yet we hear of prizes given for rapid sketches to be reproduced by the processes. Indeed, I believe that is the wrong road, the baneful result of living in high-pressure times. Imagine any artist of the past—you might almost say any artist of the present—consenting to such a system of education.

Sketching from life is, of course, necessary to the student, but it should be done in pencil or whatever medium is easiest at the moment; but the lines for reproduction require thinking about, thinking what to leave out and how to interpret the grey of a pencil, or the tints of a brush sketch in the fewest lines. Thus, and thus only, the student learns the art of leaving out "the value of a line."

The tendency of modern illustrators is to imitate somebody; and in line drawing for the processes where the artist and not the engraver has to make the lines, imitation of some man's method is almost inevitable.

Let me quote an instance. The style of the late Charles Keene is imitated in more than one journal at the present time; the artists catching his method of line more easily than the higher qualities of his art, his *chiaroscuro*, his sense of values and atmospheric effect. I say nothing of his pictorial sense and humour, for they are beyond imitation. It is the husk only we have presented to us.

As a matter of education and outlook for the younger generation of illustrators, this imitation of other men's lines deserves our special consideration. Nothing is easier in line work than to copy from the daily press. Nothing is more prejudicial to good art or more fatal to progress.

THE NATIONAL PORTRAIT GALLERY, EDINBURGH.

AN important advance has been made in the decoration of the National Portrait Gallery, says the *Scotsman*, by the completion of the sculptured work of the handsome Gothic doorway of the building. The cost of this has been defrayed by the original donor of the Gallery, Mr. J. R. Findlay; and its execution by Mr. Birnie Rhind, A.R.S.A., has been superintended by the architect, Dr. Rowand Anderson, and a committee of the Board of Manufactures. In the design both the Marquis of Bute and Sir Noel Paton took a great interest. The scaffolding having been removed, the beauty of the work was for the first time revealed to public view on Friday. Many stopped to admire it; and many more, when they hear of its completion, will no doubt take an early opportunity of viewing it. The main features of the design may shortly be recalled. Rising from the apex of the gable, and projecting above the open balustrade at the wall head, is a female figure symbolical of "History." It is 5 feet 6 inches in height, and holds in the left hand a scroll, and in the right the recording pen. In a large quatrefoil panel below the apex of the gable has been carved a representation of the Scottish coat-of-arms, taken from a heraldic MS. of the fourteenth century, called the "Armorial de Gelre," which is preserved in the Royal Library at Brussels. This MS. contains the emblazonment of the armorial bearings of great princes and their subjects, and included among these is what is supposed to be the earliest representation of the Scottish arms extant. The figure of the lion demurely sitting on the

* One of the most accomplished of English painters told me the other day that, when he first drew for illustration, the wood engraver dictated the angle and style of cross-hatching, &c., so as to fit the engravers' tools.

top of a cushioned crown with a sword in his front right paw and of the lion on the shield are very quaint in character. The arms have no supporters. They consist simply of shield, helmet and crown, the flowing mantling of the helmet being decoratively elaborated for the due enrichment of the panel.

Immediately below this, and under the main arch over the windows, is a large panel, 15 feet wide by 7 feet high, the treatment of which forms the chief feature of the design. In the centre, seated on a throne, is a life-size female figure, representing Scotland crowned. In her left hand she carries a flag bearing the cross of St. Andrew, and in the right the orb of sovereignty. On her right is a group symbolical of Industry. A male figure in leathern apron, and resting his right arm on the handle of his hammer, represents a worker in metal; by his side is a female figure seated at a spinning-wheel, and holding in her hand the distaff. On the left is a group symbolical of Religion—the idea being to suggest that the virtues associated with religion and industry have raised the country to the proud position she occupies among the nations of the earth. In this latter group is a tall figure in flowing vestments, with his hands raised in the act of benediction, and kneeling at his side, as if in the act of prayer, is a female figure with draperies happily arranged. The simplicity and dignity of the design, the skilful grouping of the figures, and their admirable execution, are noteworthy features of this part of the work. Below the arched windows are three panels—the central about twice the size of the others. In it is a group of well-arranged figures, 3 feet 8 inches in height, representing the Fine Arts. Poetry, on the extreme left, looks thoughtful, chin on hand; Music carries an ancient harpsichord; Architecture, a scroll; Decorative Sculpture, a mallet; and Painting is symbolised by a Mediæval figure, recalling Fra Angelico, who stands with palette and brushes in hand. On the right or west side the group is devoted to the Sciences, with figures in varied attitudes, suggesting mathematics and geography, astrology, astronomy and medicine; and in the east or left side the panel contains representatives of craftsmen of the stone, bronze and iron ages—the implements they wield being studied from examples in the Antiquarian Museum inside. The spandrels of the four arches of the window have been filled in with diaper work, and the decorative effect of the whole design is extremely fine, and does credit to all connected with its inception and execution.

Two statues are still wanted to complete the decoration of the central doorway. The higher niches are now filled by the liberality of Mr. Thomas Usher and the late Mr. John Livingstone with figures of Malcolm Canmore and his Queen Margaret—the St. Margaret of Scotland—but no one has yet responded to the challenge the late Lord President Inglis gave in opening the building, to come forward and offer to defray the cost of statues of Wallace and Bruce, which under the scheme of decoration are to be placed in the lower niches. The Town Council hold in trust funds for the erection of statues to these two great champions of Scottish freedom, but the application of that money is so hedged round by absurd conditions that it may be feared it could not be made available for figures for the National Portrait Gallery. In this connection it may not be amiss to recall the main points of the scheme for the adornment of the façade of this fine edifice by effigies of eminent Scotsmen who lived before the present century. It was no part of the idea of the original donor of the building that he should hold himself responsible for the cost of the figures necessary to fill the 30 niches which are to be found on three sides of the galleries. The decoration of the central doorway was also to have been executed by outside aid, but the original donor subsequently consented to bear the expense of this important part of the work in order to relieve the bareness of the façade and to give the decorative scheme a good start. The selection of the names of thirty representative Scotsmen whose effigies are to fill the niches was a work of some difficulty and delicacy, but after it was drawn up it was hoped that existing Scottish families whose distinguished predecessors were included in the scheme would come forward and assist in this national work, and that public bodies might also see their way to do the same. The only nobleman who has yet responded is the Earl of Moray, and at his charges a statue to his distinguished ancestor, the Regent Moray—executed by Mr. John Hutchison, R.S.A.—was this week placed in one of the niches to the east of the doorway. It is proposed that along the façade there should be effigies of four Scottish kings—Alexander III., James I., James V. and James VI., and of these James VI. has been erected out of funds placed at the disposal of the Board of Manufactures by the committee of the recent Stuart Exhibition in London. On the right of the doorway the scheme provides for statues of Lord James Douglas—the good Lord James—of Knox and Buchanan, of Cardinal Beaton and of John, Duke of Argyll. There was a confident expectation that the Knox statue would have been forthcoming, but memorials to Knox somehow have a knack of coming to nought. The other figures it is proposed to group round the corner towers. At the south-east corner it is suggested that there should be

effigies of these representatives of Scottish literature—Barbour, Dunbar, Gawain Douglas and David Lindsay; the north-east corner is set apart for a group of scientific men—Napier, Stair Hutton, John Hunter and Watt; and the north-west corner to Admiral Duncan, Sir Ralph Abercromby, David Hume and Adam Smith. As to the last-mentioned Scotsman, a townsman of Edinburgh, to whom there is no public memorial in the city, it was hoped that some of the mercantile bodies in Edinburgh and Leith would have been at the cost of a statue to so eminent a financier; and, as these effigies are executed in sandstone, the price is by no means prohibitive. To the ladies of Scotland the façade is to be indebted for what will be one of its most attractive groups, which is to be placed in the large niche in the north-east corner tower. This will represent Queen Mary of Scots, with her friends, Bishop Leslie and Maitland of Lethington, on each side of her.

EARLY PAVEMENT TILES IN IRELAND.

THE last number of the Journal of the Royal Society of Antiquaries of Ireland contains a paper by Mr. W. Frazer, F.R.C.S.I., on early pavement tiles, in which he says:—

The employment of baked bricks and tiles for building purposes dates back in England to the period of Roman occupation. The Roman brick resembled in shape a large-sized flat tile, made from clay, with so much vitrifiable material in addition as would render the resulting mass, when strongly heated, almost everlasting. This is observable in the remains of Roman buildings still existing, and in the walls of numerous early English churches, where the old bricks were utilised after having passed a long and useful career in walls or houses of preceding ages. A Roman brick, by its peculiar shape and composition of well-baked and partially vitrified clay, may be considered the type from which our pavement tiles for church purposes were derived.

There is no satisfactory evidence that pavement tiles were introduced into Ireland earlier than the date of the Norman Conquest. They must have reached this country soon after that period for decorating the magnificent ecclesiastical structures which were constructed by the followers of Strongbow and their successors to replace our humble and modest native shrines. They would appear to have reached us across the sea, as a constant communication was kept up with England, principally through Bristol and Chester, and there is a remarkable resemblance observable between many of the patterns found on tiles in English churches and those got in Ireland; besides, we know they were manufactured in Britain, as the kilns themselves have been found there; whilst, so far as present information extends, no positive traces have yet been discovered of the presence of kilns for baking tiles on Irish soil. This statement must be considered open for future investigation, for there are some tiles of ruder and later fabrications which may possibly have been made on this side of the Channel.

Mr. Oldham, in a paper published some years since, which contained drawings of thirty-two Irish tiles, being the first attempt at giving representations of their patterns, when describing certain tiles found in St. Patrick's Cathedral, directed special notice to their being nearly identical with others obtained from Malvern Abbey, in Worcestershire. It is important to note that an intimate ecclesiastical connection is known to have existed between those places; for, in A.D. 1225, the year in which St. Patrick's became a cathedral establishment, the prior and brothers of Malvern the Less re-granted to it one-half of the tithes of Castleknock, which they obtained in A.D. 1221. A similar connection occurred between Newtown Abbey and Malvern; for, in A.D. 1224, the prior of the latter establishment granted to the Priory of SS. Peter and Paul, at Newtown, all the lands of Dunsink, and rents out of Keppock and Dobber, &c. (see "Archdall," p. 561). In the same paper he alludes to the discovery of the tile-works at Malvern, with fragments of broken tiles in various stages of the process of manufacture, but is inclined to claim for Ireland and Irish workmen, the genius which is undoubted, to fabricate similar tiles, and the positive manufacture of them which is yet unproven.

The majority of our specimens we obtained from the ruins of Cistercian houses, such as St. Mary's Abbey, Dublin (the Notre Dame De Ostmanby); from Mellifont, their parent settlement; from Bective, Douske, or Graignamanagh and Jerpoint. It is possible that if other establishments of the Order were examined they would afford additional supplies, but their use cannot be altogether limited to edifices under Cistercian rule. Mr. Oldham has given the oft-quoted extract from "Martène's Thesaurus Anecdotorum," communicated to him by the Rev. Richard Butler, of Trim, about one of the "Select Statutes" of a General Chapter of the Cistercian Order, A.D. 1210:—"Let the Abbot of Beaubec (in Normandy), who has for a long time allowed his monk to construct, for persons who

do not belong to the Order, pavements, which exhibit levity and curiosity, be on slight penance for three days—the last of them on bread and water; that the monk be recalled before the Feast of All Saints, and never again be lent except to persons of our Order with whom let him not presume to construct pavements which do not extend the dignity of the Order.” As Mr. Oldham’s paper is not easily obtained, it may be desirable to recall the words of this statute, which appears directed against the fabrication of patterns representing ludicrous or offensive subjects, rather than a display of narrow monastic jealousy of other ecclesiastical orders; still, it is certain that, excluding our cathedrals, it is in Cistercian and the allied Benedictine establishments that tiles are found in greatest abundance here.

When compared with the extensive series of decorative tiles belonging to the wealthy abbeys of England, those discovered in Ireland are very inferior in numbers and importance. For example, if we consider heraldic tiles alone, a series of the utmost interest for historic purposes, which are amply represented in the English series, the contrast is striking. With the exception of one great family—the Geraldines—there is not another example of heraldic blazonry found in our abbeys. An imperfect and broken tile obtained from Howth Abbey, of which Mr. Oldham gives a rough sketch, may display the arms of the St. Lawrences, but it will require better preserved specimens to determine this than such as are known at present.

A few large tiles of exceptional size and thickness were found in Dublin, which are about equal in surface to four ordinary flooring tiles joined together, and $1\frac{1}{2}$ the usual depth. They were decorated with bold patterns, and well glazed. The examples which first came under my observation were obtained from explorations carried on around Christ Church Cathedral, and others subsequently turned up in St. Audoen’s Church, High Street, Dublin. They bear a close resemblance in shape to the old Roman brick, and to those bricks still employed for building in Austria. Large and thick tiles like these were, it is believed, intended for attaching to walls. They are technically recognised by the distinctive name of *dossal* tiles. When they first reached my hands it was difficult to ascertain what they were intended for, as similar specimens had not been previously described in Ireland. They are much oftener obtained in English abbeys. F. Renaud, M.D., F.S.A., in a valuable memoir on the subject of “Tiles,” contributed to the “Transactions of the Lancashire and Cheshire Archaeological Society,” vol. ix., mentions that within the last twenty years a number of “wall or *dossal*” tiles have been removed from Malvern Abbey. This notice is of peculiar interest in association with the ancient connection already mentioned of Malvern with our St. Patrick’s Cathedral and Newtown Abbey.

A few tiles were also found at Christ Church Cathedral and St. Audoen’s, Dublin, about the size of ordinary specimens, though made of greater thickness; they were glazed uniformly on the surface with a thick, vitrified layer. The clay forming them was well burned and very hard.

The simplest process for decorating tiles was by painting some suitable pattern on the surface of the moulded clay. If previously baked it would become more absorbent. This was subsequently covered by an easily fusible compound, and strongly fired to vitrify the glaze—a process still employed for making earthenware. Such tiles, when subject to much traffic, would in a short time become worn down, and more or less defaced; they are therefore seldom obtained from explorations, unless in a damaged condition.

The ordinary process followed in tile works was forcing the damp clay into suitable moulds, having the intended designs raised in relief, so as to produce corresponding sunk impressions on the surface of the clay; it was then ready for being glazed and baked. The greater number of our better-preserved tiles were manufactured in this manner, and from the depth of the impressed lines they could bear a considerable amount of friction without becoming worn down.

A third variety of the “*encaustic*” tile consists of those in which sunken depressions of the intended pattern were got by stamping, and subsequently filled up to the level of the rest of the surface with pipeclay or some light-coloured marly earth before baking and glazing. Numerous handsome designs resulted from this procedure. Such tiles wore fairly well, and presented several advantages for decorative purposes.

In a fourth form of tile the pattern, was elevated above the surface of the clay, projecting more or less. This procedure would enable an artist to display skill and taste in his work, but did not produce tiles capable of enduring rough usage or heavy wear.

The vitrifiable material, used for glazing over the surface of the baked clay, could be modified in composition to produce different tints of colouration. It consisted of glass or its components, with a considerable amount of oxide of lead, which required comparatively moderate temperature for its fusion. When this glaze has undergone partial decomposition by lying imbedded in damp soil charged with putrefying or decaying

matters, we find it is liable to acquire a dark or blackish hue from the production of black sulphuret of lead. The earlier descriptions of English earthenware appear to have been covered with some kind of salt glaze over colour, as they are obtained unchanged in their appearance after centuries of exposure.

MUNICIPAL INSIGNIA.

A CONVERSAZIONE was lately arranged by the members of the Lancashire and Cheshire Antiquarian Society in Manchester. A collection of municipal insignia was lent for the occasion by the Corporations of Manchester, Lancaster, Chester, Carlisle, Macclesfield, &c.

An address was delivered by Chancellor Ferguson, F.S.A., on “The Dignity of a Mayor, or Municipal Insignia of Office.” He said that under the term “municipal insignia” he included rods or wands of office, maces both great and small, oars, swords of honour or state, caps of estate or maintenance, chains and badges both of mayors and other officials, rings and robes, halberts, horns and constables’ staves. Few people have the most remote idea of the amount of artistic wealth, of antiquarian treasure and of historical relics possessed by and lying hidden away in the strongholds and chests of the various corporate bodies of this kingdom. The corporations are rich beyond compare in works in the precious metals, in emblems of state and civic dignity, in relics of Mediæval pageantry, in badges and insignia of various offices, and in seals and records of different periods. The neglect with which these treasures have been treated has been astounding. The reformed corporations of 1837 despised municipal pageantry; many actually sold their insignia for the best prices they would fetch “as relics of the barbarous ages.” Others discarded the use of their insignia and their existence was almost forgotten. A reaction, however, set slowly in. The Great Exhibition of 1851 caused some places to provide their mayors with chains in order to attend at the opening. Other places were induced to buy new or refurbish up old insignia on the occasions of royal visits. During the International Exhibition of 1862 a loan collection, but on a small scale, was formed, to which several corporations contributed their maces and other objects. In the year 1874 the Royal Archaeological Institute presented to the Mayor of Exeter a chain of office in commemoration of the Congress held at Exeter in the previous year. This excited so much interest that the council of the Institute in 1875 entertained the idea of holding in London an exhibition of chains of office and other municipal insignia. A committee was formed and circulars were sent to nearly 600 municipal bodies, asking for information as to their insignia. About 300 replies were received; but in those about one-half neglected to describe their insignia, or contented themselves by saying they were “old and of no value.” Some of those who thus replied possess most valuable insignia. In 1888 an exhibition of municipal insignia was held in the rooms of the Society of Antiquaries of London, at which, by the courtesy of several mayors and corporations, a fine and typical series of 130 maces and twenty-four swords of state, four silver or silver-gilt oars and one wooden, and other articles were exhibited. But this was surpassed by the magnificent show which was got together by the Lord Mayor of London in the Mansion House last July, on the occasion of the visit of the Royal Archaeological Institute to London. About 170 maces were brought together, or 200 if we include the maces of the Wards of London; twenty-seven state swords, four caps of maintenance, fifteen silver oars, together with a number of the mayors’ chains. Many of the things thus brought together were of the most remarkable interest and beauty. Different views have been held as to the origin of the mace. Some have supposed that the regal sceptre, the ecclesiastical virga or virge and the civic mace all had their emblem of straightness and integrity of rule, consisting of a plain slender rod anciently borne before kings and high public functionaries, and retained to the present day as an official badge by sheriffs and attendants in courts of justice and by some mayors. The other is, that the civic mace is derived from the military weapon of that name. Chancellor Ferguson, after describing the maces, called the attention of the members to some of the maces on the table, amongst them being the great mace from Congleton, which is silver gilt, and is $41\frac{1}{4}$ inches long (an almost unaltered Commonwealth mace made in 1651, altered in 1661), and the silver mace from the same place of the time of James I., and which is of an uncommon type. The Wigan silver-gilt mace, 41 inches, is a fine example of Commonwealth pattern made in 1657 and altered at the Restoration; and their copper mace, 42 inches, is of a plain Commonwealth pattern, also altered at the Restoration. The Clitheroe mace was given to the town by General Monk at the Restoration. The lecturer then gave a description of the state swords. Amongst those on the table was one from Chester, of fine early fifteenth-century work. The lecturer concluded with a description of oars, caps of maintenance and civic robes.



Carriage-way Pavements for Large Cities.

SIR,—Referring to the paper read by Mr. Isaacs on the above subject, a report of which appears in your issue of December 22, without wishing to enter into a discussion, we would like to say we think Mr. Isaacs has overlooked a very important fact in connection with West Australian hard woods, at least those which have been laid in London, and that is, that they belong to the eucalyptus order, and are natural disinfectants.

That the blocks contain eucalyptus we have proved, and it seems to us, therefore, that the highest standard sought, viz. "on the score of public hygiene," is met in these woods, and they should therefore be placed first on the list.

In the summing up on the "comparative merits and demerits," Mr. Isaacs classes all woods together. We are willing to allow the position he has given to soft woods, viz. last, "on the score of public hygiene," but we certainly must take exception to the West Australian hard woods being coupled therewith, for as a fact they are as far apart as they possibly can be.

Our wood is a hard, non-absorbent and sanitary wood; soft wood, on the other hand, is a spongy, absorbent, and therefore unhealthy wood. The allusion Mr. Isaacs makes to the offensive smell given off by the soft woods we venture to say he cannot apply to our hard woods.

One has only to observe the two woods to arrive at conviction. Within twenty-four hours after wet the Australian wood is, generally speaking, dry; not so with soft wood, which retains the moisture for days, almost weeks after.

Out of the seven lines laid down by Mr. Isaacs at his initiation of the subject as essentials, we claim the whole seven for our woods, viz.:—

1. "It must be a sanitary pavement, and as noiseless as possible." We have answered this above.

2. "It must be safe for horses," &c. We hold that these Australian woods afford a good foothold for horses, though, like all other roads in greasy weather, they require sanding—we should prefer for ours merely washing. Even in dirty weather the Australian hard wood roads are not more slippery, except at the points where they meet a granite, soft wood, or macadam road, and there the slipperiness is caused by the mud taken off these other roads on to the hard woods.

3. "It must be as free from dust and mud as possible." Observe a "Jarrah" road in dry weather. We venture to say the small quantity of dust will compare favourably with asphalt, whilst it leaves the soft wood road far in the rear.

4. "It must be economical as regards its first cost, maintenance and cleansing." Though the Australian wood may be dearer in the first place, it is, by reason of its durability and consequent less need for repair, economical in the end.

5. "It must be durable." As to the Australian hard woods, we don't think any surveyor has had sufficiently long test to bring comparison to bear, but so far as tests could be made, we don't think we shall be far behind other materials, not even excepting granite. We will give an instance. At Charing Cross our "Jarrahdale" wood was down nearly four years on the spot where before soft wood had to be replaced in nine months. Therefore, if the same soft wood would wear in an ordinary road, as Mr. Isaac quotes, nine years well, a simple calculation will give "Jarrahdale" a life of forty-eight years. How's that for durability? Then, again, there is a piece of roadway at the foot of Westminster Bridge laid with our wood, has been down about five years, has had no repairs, shows no sign of wear, has every appearance of seeing most of the present generation out.

6. "It must be easily cleansed and of a non-absorbent nature." We explain above about the non-absorbent nature, and it certainly is capable of being easily cleansed.

7. "It must admit of being readily taken up," &c., which goes without saying. We notice Mr. Isaacs refers to the portions of West Australian woods taken up at Kensington. We can only answer this by saying they are laid in other parts of Kensington and seem to give every satisfaction. Considering that there are some ten miles of "Jarrahdale" roads laid in London, it seems rather remarkable that at a place where only a few yards are down there should be complaints, yet not at any other parts; we cannot explain and therefore will not attempt.

Mr. Isaacs, we notice, draws a comparison between the prices of yellow deal and Australian hard woods to the detriment of the latter.

The higher price of our wood may be accounted for by the fact that it is cut free from the heart, "sap, shakes, knots and other imperfections."

Now Mr. Isaacs says blocks should be laid free from these imperfections. We ask, Are yellow deal blocks so laid? We

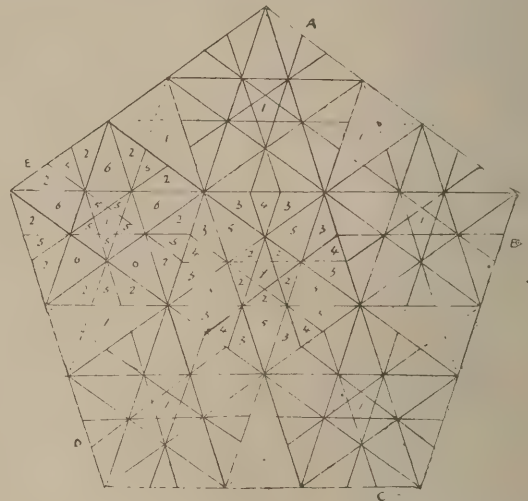
further ask, If they are, would the price of Jarrah bear such an unfavourable comparison? We think if deal blocks were bought without knots and other imperfections the price would run "Jarrah" very close.

Pardon the length of our remarks, but we think, in justice to our "coming colony," one of their chief products should not be set down on a par with an inferior wood and so condemned for that purpose for which it is so eminently adapted.—Your obedient servants,

The Rockingham Railway and Jarrahdale Timber Co., Lim.
F. CHAPMAN.

The Pentagon in Decoration.

SIR,—The simplicity and beauty of the figure below is so obvious that any description is unnecessary, beyond the remark that it is a repeating pattern, and that by making it a centre with five other similar ones based on the five sides, a beautiful ceiling or other design is the result. The colours of the centre may be red 1, blue 2, green 3, yellow 4, white 5, brown 6—modifica-



tion to suit artistic taste. The colours of the other five may be the same or counterchanged, as indicated by the numbers. It will be observed that though the figure consists of right or straight lines only, the circle is developed sufficiently to give beauty to an otherwise rigid design of right lines. When developed a triangular piece is formed between the five pentagons, and may be filled up by continuing the lines across it and colouring differently.

H. TRAVIS.

5 Beaconsfield Terrace, Sydenham.

GENERAL.

The Reconstruction of the Opéra Comique has been at last undertaken, in spite of the dissatisfaction caused by the selection of plans.

M. A. Mercié, the sculptor, has, after some hesitation, undertaken the commission for the Gounod memorial, which is to be erected in Paris.

The Late Mr. Aubrey Bowen, of Melbourne, has bequeathed sufficient money to Mason College, Birmingham, to found six scholarships of 100*l.* a year each for the promotion of the study of metallurgy, civil, mechanical and electrical engineering, and chemistry.

A Competition was lately arranged among local architects for plans for a Board school in Stoneyholme, Burnley, to cost 10,000*l.* Mr. Murgatroyd, the assessor, has awarded the first prize of 20*l.* to Mr. Quarmby, architect, and the second (10*l.*) to Mr. Dunkerley.

The "Holy Carpet" from the mosque of Ardebil, which was completed about A.D. 1540 by Maksoud of Kashan, has been temporarily placed in the Indian Museum at South Kensington. It cost 2,500*l.*, of which sum one-third was subscribed by Messrs. A. W. Franks, W. Morris and Steinkopff, the rest being paid by the Department.

Messrs. Jeremiah Head & Son have transferred the headquarters of their consulting practice in civil, mechanical and metallurgical engineering, hitherto carried on at Middlesbrough, to 47 Victoria Street, Westminster. The Middlesbrough office will be retained as a branch.

The Manchester Corporation have purchased Mr. John Cassidy's bronze statuette, *The Digger of the Manchester Canal*, for the permanent collection at the Art Gallery.

Mr. Nisbet Blair, C.E., borough engineer and surveyor of St. Pancras, has joined the consultative council of the National Building Exhibition.

The Architect.

THE WEEK.

THE election of three Associates of the Royal Academy on Tuesday will not give rise to more than the customary amount of disappointment. The success of Mr. J. S. SARGENT testifies that the Americans have a claim on the Academy which was created prior to the separation of the Western colony. As the artist was born in Florence and acquired skill as well as reputation in Paris, he may not care to be put down as an American citizen. Mr. SARGENT is a representative of the new system of æsthetics, and his election is a victory over the ancient school. Mr. FRANK BRAMLEY, as a member of the Newlyn School, may be also considered by some people as belonging to a revolutionary class, but if compared with Mr. SARGENT's experiments his paintings will be found to be cast in an antique mould. He can appeal with success to the emotions of the crowd, and we ought to be thankful he exercises so much restraint. It would be easy for him to rival Mr. MARCUS STONE in popularity. Mr. FRAMPTON, as a sculptor, has shown his competence, but where are the commissions which he merits? His election is important, for it denotes that architectural decoration is not to be classed with cemetery masonry. It may be said that architecture was passed over at the election. There are, however, seven architects in the Academy, and it cannot be said that any architect is able to do much to increase the profit of the annual exhibitions, a consideration which cannot be overlooked.

THE advantage of burning as an economical means of ridding the world of the costliest of architectural fiascos—the Chicago World's Fair—was demonstrated on Monday night. Mr. BURNHAM's proposal is, therefore, likely to be accepted. The columned peristyle, the casino, the music-hall and the structure for the useful arts have vanished into nothingness. The exhibition was inspired by the greed of the people of Chicago who, under the pretence of promoting arts and industries, were enabled to fleece a good many visitors. It was characteristic of the citizens that they should obstruct the firemen when endeavouring to save some of the objects that remained in the structures, and that when the strangers' property was destroyed they tried to make it out as valueless. Whatever else they may do, international exhibitions do not promote commercial morality. We suppose no time will be lost in clearing the ground of the remaining buildings, but it would be more advantageous for people at a distance if tourists who visited the exhibition could be persuaded to refrain from trying to convince those who wisely remained at home that the World's Fair was an event in universal history and inaugurated a new era.

MR. J. W. BUTTERWORTH is having a window prepared in Munich for the Stationers' Hall, to commemorate his holding the office of Master of the Company. The subject is the visit of EDWARD IV. to CAXTON at Westminster. It is an odd way to recall two—or shall we say three?—English worthies. There will be no necessity to put the customary announcement "Made in Germany" on the window. That would be evident in any case, but it is understood that for the BUTTERWORTH memorial especially strong colours are employed, either to signalise its importance or to gratify the peculiarities of the worthy Stationers.

A REPORT has been prepared by M. ANTONY VALABRÈQUE for the French Minister of Public Instruction, concerning the examples of French eighteenth-century painters which are to be found in German galleries. It is needless to say the delegate was struck with those which are to be seen at Sans Souci. FREDERICK THE GREAT was not unwilling to make war on the French, but in literature and art he held they were irresistible. Apparently he would have sacrificed a part of his renown as a warrior to see his name printed in a list of French rhetoricians. Every tourist will remember the Frenchified character of the king's rooms, the French books (there is not one by a German in the bookcases), the French statuettes and other knickknackery

which abound, so that it is difficult to resist the impression that the place must have belonged to some *petit maître*. FREDERICK had a penchant for pictures by LANCRET and PATER, CHARDIN, COYPEL, &c. There is a series of fourteen compositions by PATER from SCARRON'S "Roman Comique," and about forty works by that artist are to be seen at Potsdam. We must say his French pictures do more credit to the king's taste and judgment than those belonging to other schools. There is a big gallery to which the visitor descends, which the courtiers probably declared exemplified the *Gusto Grande* at its best, but it contains more daubs than will be found in any gallery of the size in Europe, with the exception, of course, of the gallery in Hanover, in which the lowest depth of royal connoisseurship was reached.

AMONG the papers read at the meeting of the Society of Antiquaries of Scotland on Monday was one by Mr. ALEXANDER HUTCHESON on a bell which is in the church of Kettins, Forfarshire. The late Mr. JERVISE, in his "Epitaphs and Inscriptions," had given a version of the inscription on the bell, but had not ascended the belfry to verify it, and the reading was unintelligible. With the assistance of Mr. J. W. MUNRO, inspector of schools, Mr. HUTCHESON had obtained a correct transcript of the inscription, which was a curious one:—"Maria Troon Es Minen Naem, Meester Hans Popenreider Gaf Mi. Anno Domini MCCCCXIX." It is evident that the bell is Dutch and that it belongs to pre-Reformation times. But the reason for giving to the bell the name of Maria Troon and the connection of Hans POPENREIDER with the parish of Kettins were not so easily discovered, although it had been ascertained that a Hans POPENRUYTER was principal gun-founder to King HENRY VIII.

THE exhibition in the Manchester City Art Gallery, which came to a close on Saturday last, obtained more than the average amount of support. Twenty-seven oil-paintings, twenty-three water-colour drawings, and one example of sculpture were sold, which were valued at 3,961*l.* 1*s.*, as against fifty-nine sold in 1892, valued at 2,029*l.* 1*s.*, and fifty-four sold in 1891, valued at 1,509*l.* 1*s.* The total number of visitors has been 87,574, against 77,272 in the season of 1892 and about 57,000 in 1891. The present season's total has been made up as follows:—23,617 visitors have been admitted by payment, 12,764 by season tickets, and 51,193 have been admitted free of charge. The number of season tickets sold has been 1,155, against 1,144 in 1892 and 851 in 1891. The number of catalogues sold has been over 8,000, or about the same as last season. The spring exhibition of works by members of the Manchester Academy of Fine Arts will be opened on February 20.

IT cannot be too generally known that a contractor who undertakes the construction or repair of a road is likely to be held responsible for accidents which may arise, rather than the owners of the adjoining houses or the local authority. A case which settles the legality was tried in the Birmingham County Court on Tuesday. A mechanic, who was the plaintiff, stated that one evening in August he was passing along Green Lane, which was being constructed by a firm of contractors. As the road was not sufficiently lighted he stepped in the darkness on some dislodged setts, which formed part of the gutter and kerbing, and was thrown violently down, sustaining injuries to his right hand which had incapacitated him from following his employment since. Mr. FITZMAURICE, one of the contractors, swore that the setts were properly placed and rammed, and his counsel also argued defendants could not be held liable, inasmuch as the road either belonged to the Corporation, in which case they would be responsible, or it was the property of the inhabitants, in which case the general public would have no right of way. The judge, however, declared that the law was that so long as a road was in the hands of contractors for construction or repair they were liable for any negligence. The fact of a road not having been taken over by the Corporation did not affect its public character unless a notice was put up forbidding persons to make use of it. The plaintiff claimed 50*l.*, but the judge considered that 29*l.* 1*s.* would be adequate for the damages.

ENGLISH RENAISSANCE.*

THE excellent work on the Renaissance buildings in England has been completed in a manner that is creditable to the authors and publisher. Their promises have been more than realised. Instead of 122 large plates and 100 illustrations in the text, they have given 145 of the former and 180 of the latter without extra cost to the subscribers. The whole of the plates have been produced in uniform style, a result which is not easily insured with a photographic series.

The subjects in the sixth part are:—Moyns Park; Wyvenhoe Cottage; Trinity College, Cambridge; Caius College, Cambridge; King's College, Cambridge; Merton College, Oxford; The Schools, Oxford; Convocation Room, Oxford; Wadham College, Oxford; St. John's College, Oxford; Jesus College, Oxford; Bramshill; Chastleton House; Charlccote; and Wollaton Hall. The collegiate examples form, as it were, a dignified close, like DRYDEN'S "dying fall," for the series. A few words on the plates may be allowed.

Moyns Park, in Essex, is one of the great houses erected by successful lawyers which have been illustrated by Mr. GOTCH. By some freak of economy or respect for precedent Baron GENT built his mansion without destroying an older residence which stood on the site, taking care, however, to completely veil it by his loftier buildings. The front shows wide bay windows which are not surmounted by gables, the latter appearing between them over ordinary windows. The alternation has a rhythmic effect which is pleasing. Ivy and lichens cover the greater part of the front, and impart repose and interest to it.

The Cottage at Wyvenhoe, also in Essex, is doomed to demolition. It is a remarkable example of plasterwork, and we might suppose from the extent of the ornamentation that the little dwelling belonged to a plasterer who utilised his spare hours on its adornment. Some details of plasterwork about Ipswich are also given.

The fountain in the quadrangle of Trinity College, Cambridge, is a well-known object. It was erected between 1601 and 1612. Two English carvers, WYAT and THORPE, are recorded as working on it, but the name of the designer has been forgotten. The fountain, consisting of two shell basins, stands under a canopy, the arches being supported by Ionic columns. The hall of the college was designed by RALPH SIMONS, and was raised in 1604-5. The screen is a characteristic example, and the details are as sharp as if they were cut in basalt. Some parts appear as after-thoughts—such as the cherubs' heads in the spandrels, but the impressive effect cannot be questioned.

DALLAWAY, in describing the gate of honour at Caius College, says:—"At Caius College a specimen of the members of Palladian architecture in miniature was first exhibited to the university in a gateway designed by THEODORE HAAVE, or CLEVUSSIS, an architect, sculptor and painter of eminence in the reign of Queen ELIZABETH. It nearly resembles the tombs of that age, which were composed of various marbles formed into columns, entablatures and alcoves upon the Italian plan, then newly introduced into England; and it rests upon the door-case as a superstructure. Much as it was once admired, its present claim to notice is merely that of curiosity." The structure may be said to consist of three independent parts, viz. a sort of triumphal arch below, a miniature temple above it and a hexagonal superstructure. There is little unity in the whole, but it is not without interest as suggesting an early attempt at combining Italian examples. FERGUSON declares it to be "the most complete specimen of Classical art which was at that time to be seen in England." The screen in King's College Chapel is not overpraised by Mr. GOTCH when he says:—"It is, indeed, the finest example of woodwork in England, if not out of Italy, and one might even go further and say that in its masterly simplicity of design it is to be preferred to a great deal of Italian work, in which it is evident the facility with which the artists wielded their tools became a snare unto them. It is not known who was the designer or who were the workmen. It has been conjectured that

HOLBEIN might have designed it, but it is quite certain that foreign carvers must have been employed to execute it, for although there is an English feeling about the panels, it would have been impossible for English workmen to have acquired the mastery of a foreign style of ornament so early as 1531-35, when the screen must have been designed." The stalls in the chapel are less elaborate, but they reveal equal dexterity in dealing with refined Italian detail. More vernacular is the carving from St. John's and Clare Colleges and the ornament seen in some of the stained-glass at Cambridge.

The work at Oxford fittingly begins with the entrance to the court of the Schools, now the Bodleian Library. As is well-known, above the gateway there are four storeys, each having coupled columns. The uniformity of the storeys in size becomes monotonous, and an excessive load is imposed on the gateway columns. The entrance to Merton College was conceived in a similar spirit. Mr. GOTCH truly says:—"The whole composition is artificial; there is nothing in the back to justify this important feature; the door leads to no special series of rooms and it is evident that the design was merely applied as an ornamental centrepiece to one side of the quadrangle, the remaining sides being treated in the simple manner visible on either hand of the principal feature." The library at Merton is another example of English woodwork. Two plates are given of Wadham College. The entrance was evidently erected at a time when a few superimposed storeys without any use were supposed, as long as there were pilasters and sculpture, to represent the height to which architectural taste could soar. The screen appears to be joiner's work, ornament being introduced in a manner which is not satisfactory. Opinions will always differ about the value of INIGO JONES'S work at St. John's College. DALLAWAY says:—"Under the patronage of Archbishop LAUD, INIGO JONES was first employed at Oxford in 1638. He built the arcades and porticoes in the inner quadrangle of St. John's College, over which is a gallery of just proportions. They are in his first manner, and copy the faults rather than the excellences of his great master, PALLADIO. The busts between the arches, and the heavy foliage and wreaths under the alcoves, are exuberant and unclassical." These words express the ultra-classical spirit, but we have grown more charitable, and JONES'S work has a right to be judged by an English as well as an Italian standard. Mr. GOTCH, with more justice, says that "the garden front has a strong flavour of the earlier Renaissance about it, and is in itself a beautiful composition, and that even the courtyard keeps largely to the old lines. It is very interesting," he adds, "to see, as we here see, the apostle of the fully-developed Renaissance using the methods of the early masters—INIGO JONES painting with JOHN THORPE'S brushes."

The screen in Jesus College is another of those laborious examples in which we find few signs of artistic inspiration. Mr. GOTCH gives sundry other examples of detail from Oxford colleges, and he is warranted in saying that "enough has been illustrated to show how the Renaissance movement affected the Universities," and to make good the opinion indicated at the outset that "although the student of the subject must not neglect them, yet he would be unwise to take the work they offer as being typical either of date or of excellence of design."

Bramshill, in Hampshire, is a good example of Jacobean. It is commonly supposed that JOHN THORPE was the designer, but Mr. GOTCH does not consider the authorship is more than problematic. The central part of the front is the most elaborate. There is an arcade below, in which is the entrance. Over it is a circular oriel flanked by terminal-pilasters; above it are two blank windows and niches with pilasters; and finally there is a sort of cresting, which is said to represent the badge of the Prince of WALES. Bramshill is one of the best examples of a brick residence in the collection. Chastleton House, in Oxfordshire, is of stone, and is more quiet in style. It is well adapted to be shown to foreigners as evidence of the conditions of old English life. In describing it Mr. GOTCH writes:—

Altogether there is about the place an air of unchanged antiquity particularly pleasant and restful, and very refreshing in those days when so many dwellers in old houses are concerned with the desire to be

* *Architecture of the Renaissance in England.* By J. Alfred Gotch, F.S.A., assisted by W. Talbot Brown. Part VI. (B. T. Batford.)

"smart." Inside the character of the exterior is maintained. Many of the rooms have lost their ancient ceilings and woodwork, but no structural change of any importance has been made, and the plan to-day is pretty much what it was when the house was built. The hall retains its oak screen and dais, the little parlour has panelled walls and a good plaster frieze, the drawing-room upstairs has its old chimney-piece and richly panelled walls and elaborate ceiling. Several of the bedrooms have either interesting chimneypieces or ceilings or panelled and tapestried walls. Old furniture abounds in every room; old books—some of great rarity—remain in the library. Some of the ancient jewellery depicted in the family portraits is still treasured by the lady who owns the house, a descendant of the builder. It would, indeed, be difficult to find a house which has come down to the present day with less of the change which constant residence necessitates.

Chastleton House is believed to occupy the site of a house belonging to CATESBY, the leading agent in the Gunpowder Plot. He sold the estate to WALTER JONES, who erected the existing mansion. It is built on a symmetrical plan round a small court. The detail is effective, but apparently it will not sustain close examination. One of the photographs represents the Gate House at Charlote, which is in one way more interesting than the mansion where SHAKESPEARE appeared in custody as a poacher, as it has been little altered.

The last of the mansions is Wollaton Hall, one of the stateliest of English homes. It is an example of a building that was planned with the object of impressing the spectator with the greatness of the owner, and in consequence it must have been at all times inconvenient as a residence. But it was, however, worth enduring privations in order to secure so grand an air for a private mansion. FERGUSON says a rich Gothic feeling pervades it, running occasionally into excesses bordering on the grotesque, but he admits that the lower part of the design is probably the happiest conception of its age in this country, and if repeated with a purity of detail as we could now apply to it, would make a singularly pleasing type for a residence of an English nobleman. The building was erected by Sir FRANCIS WILLOUGHBY in 1580-88. His master-workmen came from Italy. JOHN THORPE prepared a plan of the building, which has been carried out in all essential features; but there is a tomb in Wollaton Church of ROBERT SMYTHSON, gent., who is described as "Architector and Surveyor unto the most worthy House of Wollaton, with diverse others of great account."

The difficulty which arises in the case of Wollaton is not exceptional. Construction was organised differently in the sixteenth century from what it is to-day, and therefore we cannot expect correspondence between either the highest or the lowest offices in the two periods. On this subject Mr. GOTCH has some pertinent remarks. He says:—

It must be always borne in mind that those days were widely different from ours. In the present day, if we are struck with the beauty of a building, it is a matter of no great difficulty to ascertain who is the architect, and in all good work we may with safety conclude that it is to him that we must attribute the happy faculty of giving to his materials the forms and combinations which delight us. It is he to whom the rare and crowning glory of design belongs; the workmen are but the ministers of his will. Not so in the period under review. The architect, as we know him, did not exist. The term, indeed, was hardly known. It is only used once by Shakespeare, and then only figuratively. It is important to bear this in mind. To talk of the "architect" of Kirby, or Hatfield, or Wollaton is really misleading. There was no such functionary. There was some one who rough-hewed those buildings, but it was left to others to shape them. There was in most instances an individual who supplied a plan, and often also an idea of how the building was to look outside, and therefore this individual's influence was of considerable importance, since he it was who gave form and shape to the structure; but he was not what we think of as an architect. He was called the surveyor, and, the surveyor's share being done, his work was elaborated by numerous and insignificant artisans. Having before them the surveyor's general notion of the building—that here was to be a plinth, there a stone cornice and there a balustrade; that between those windows should be a niche, and between the others a pilaster—it would then seem, so far as we can at present ascertain, that the masons set to work to carry out these ideas in the actual building, themselves supplying the profiles of the cornices, and the patterns of the pilasters, and the sections of the mullions. Not unfrequently the employer stepped in and said, "Inscribe me here such and such words;" or, "Carve me there mine arms, and those of my lady," which accordingly the mason did to the best of his ability; and when he knew nothing of Latin, or was ill-acquainted with heraldry, the result was apt to fall short of what was intended.

Mr. GOTCH takes JOHN THORPE as the typical surveyor and designer of houses during the reigns of ELIZABETH and JAMES. He analyses the book of sketches in the Soane

Museum, and points out how few of the drawings relate to working details. There is but one section through a house and it may be concluded that THORPE was careful not to meddle overmuch with the privileges of the workmen. Some of those men may have travelled or were able to see foreign books in which Italian and French works were illustrated. Foreigners were employed in England, but their numbers declined after the reign of HENRY VIII. It is possible, however, that drawings or models were imported from abroad. For example, we find in the narrative of the travels of COSMO III. in 1669,* that Althorp was built according to a model obtained from Italy, and therefore, adds the Italian complacently:—"It may be said to be the best-planned and best-arranged country seat in the kingdom, for although there may be many which surpass it in size, none are superior to it in symmetrical elegance." The English workmen were not, however, over loyal to Italian or any one country's patterns. There was a good deal of eclecticism in the air at that time. Just as the unities were set aside by the dramatists, the plasterers, joiners and carvers seemed to consider that Italian forms were made more rich and strange or more English in character if they were adorned or united with features that were derived from the Netherlands.

This compound character is one of the charms of the buildings which Mr. GOTCH has selected for illustration. They are not Italian or French or Flemish in style, although the influence of those countries may be traced in them. They correspond with many other things in England which are more or less derivative, but have attained national qualities during the transforming process. The buildings may, therefore, claim to be essentially English, and on that account it is satisfactory to find that the two volumes have been produced in a style which does credit to the country. In any foreign, royal or imperial libraries the "Architecture of the Renaissance in England" would hold its own among the most beautiful volumes relating to art.

Mr. GOTCH mentions that however copious the illustrations may be, the text has only touched the fringe of the subject, and nothing would give him greater pleasure, should time and opportunity permit in the future, than to deal with the Renaissance in England in a fuller manner. We are certain that among the numerous subscribers to the present work there will not be found one who will not desire to see the speedy realisation of the intention.

BERNARD VAN ORLEY.†

THERE is evidence enough to show that the Flemish painter, BERNARD VAN ORLEY, was at one time prized in England, and there are grounds for supposing that he visited this country. The single example of his style, *The Magdalen Reading*, in the National Gallery, came, it is true, from a French collector; but in Hampton Court his *Christ Healing the Sick* is an ancient possession, and there are works by him at Arundel Castle, Chatsworth, Althorp, Kedleston, and other houses. The Liverpool Gallery contains one of his pictures. Six of them were hung in the Manchester Exhibition of 1857. Another circumstance that brought him into association with England was his superintendence of the Vatican tapestries, for which the cartoons are now at South Kensington. VAN ORLEY was one of RAPHAEL's pupils. That he was respected by the master is evident from such a duty. He was also a renowned glass-painter, and we suppose there are few of our readers who have not admired his windows in the church of St. Gudule, Brussels. His paintings are to be seen in the principal galleries of Europe.

Unlike the majority of painters in all ages, BERNARD VAN ORLEY could claim to have gentle blood in his veins. The family was acknowledged to be noble in Luxembourg and in Brabant. BERNARD's great grandfather married, in the early part of the fifteenth century, a patrician lady of

* See *The Architect*, vol. i.

† *Bernard van Orley*. Par Alphonse Wauters. Paris: Librairie de l'Art.

Brussels, who brought him the fief of Moorsel. They had one son who was a patrician of Sleeuws and, what was probably of more importance, a citizen of Brussels. He was the father of two sons, viz. EVERARD, who succeeded to the family dignity and possessions, and VALENTIN, born in 1466, who appears to have been the elder, but, as he was a "natuerlycke brueder," he was endowed with no more than the family name, and was left to create a new branch of the family. He became a painter, and, if he did not gain immortality, he succeeded in increasing the ranks of Flemish artists. His sons, PHILIPPE, BERNARD, EVERARD and GOMER became painters in their turn, and his daughter married an "ebeniste." In fact, VALENTIN's lineage was linked to Flemish art up to the eighteenth century.

If we compare VAN ORLEY's portrait with that terrible record which TITIAN presented of the appearance of the emperor at a later time, it will not be difficult to understand the extent of the disappointment at the weariness of imperial sway which led to the abdication, the retirement to St. Just and the funeral ceremony which preceded the death of CHARLES by a month. He was unable to bear with the world and died of disgust before he had reached his sixtieth year. The portrait of CHARLES in common with later works suggests one of the qualities of VAN ORLEY. As became a gentleman he was at his ease before grandees, and he represented them as if they were also unflurried. Among his subjects there are no smirking countenances, no attempts at posing, no endeavours to win the admiration or sympathy of the beholder. Without repose there



CHARLES V. *From the portrait by Bernard van Orley.*

BERNARD was destined to win more fame than any of the family, but when he was born is not certain. Various dates between 1470 and 1500 have been given by authorities. M. WAUTERS, who, as archivist of Brussels, should have competence to decide, believes that BERNARD was born between 1490 and 1501.

We suppose the first instructors of BERNARD were his father and his elder brother PHILIPPE. About the early years of the artist there is no information. That he was competent to paint capital portraits when barely out of his teens is evident from his portrait of CHARLES V. That prince was born in the year 1500, and, therefore, if not of the same age, could not be many years the junior of the painter. This portrait of one youth by another is marvellous in characterisation. The young emperor evidently believes in his power, although it is yet untried.

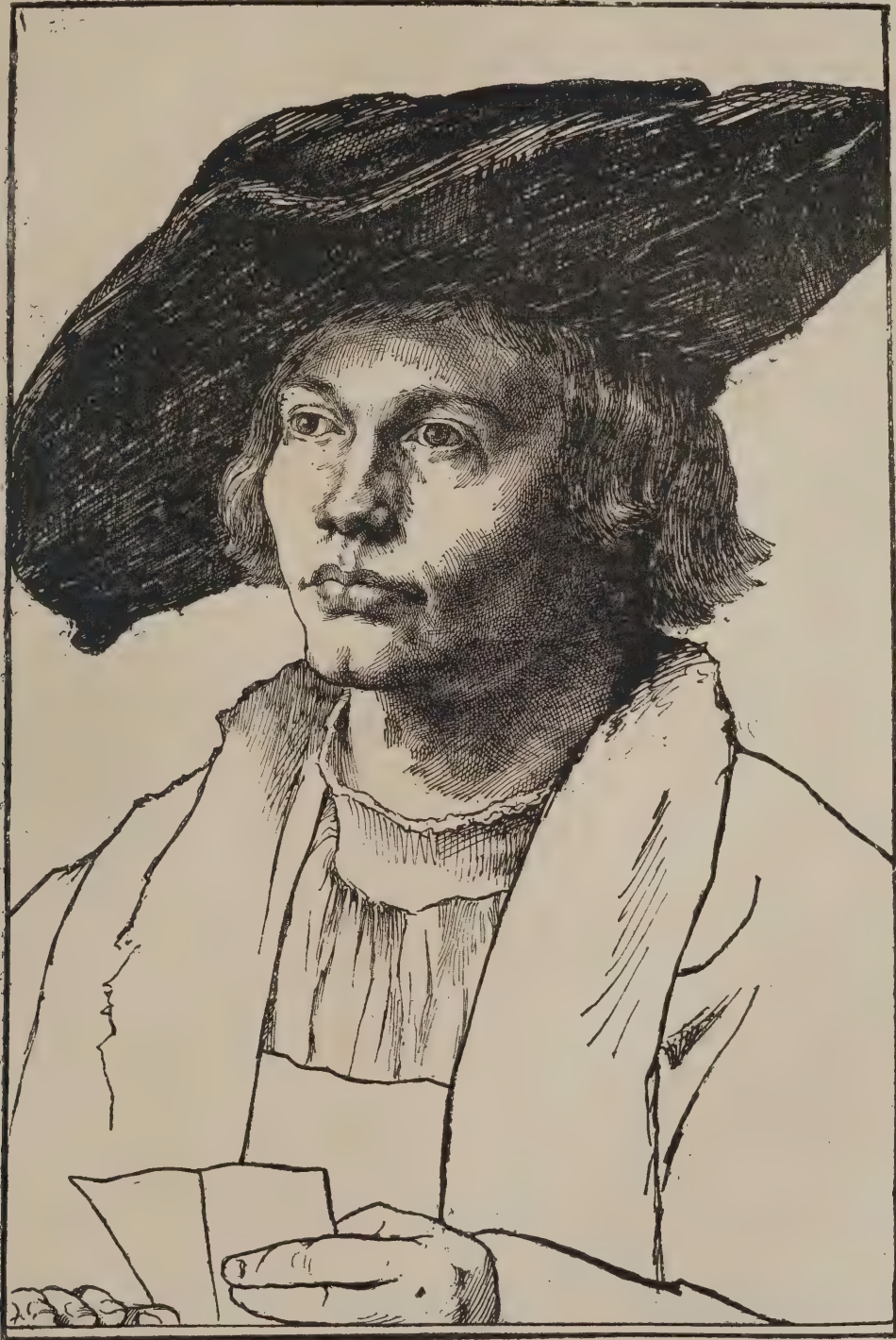
cannot be dignity, and VAN ORLEY's faculty for expressing it secured him the patronage of MARGARET of Austria, who was acting as regent of the Netherlands. It is certain that in 1515 he obtained a commission to paint six portraits of princes and princesses of the Imperial family which were to be presented to the King of Denmark, and the success of his work secured for him similar commissions. In 1518 he was appointed official painter.

He did not confine himself to portraiture in those early days. In 1515 he was selected by one of the confraternities attached to a church in Furnes to paint an altar-piece, which remained in position until 1807. Then it disappeared, and the only part that can be identified is one of the wings, which is in St. Petersburg. Besides painting pictures VAN ORLEY was largely employed in designing for tapestry weaving, which had become a national industry.

He soon became a prosperous gentleman, possessed his own house in Brussels, as well as an unusually large garden, and in order that he might have easy communication between his house and grounds, he was permitted to build a bridge over a stream which separated them.

When ALBERT DÜRER visited Brussels in 1521 he was entertained at a cost of ten florins by VAN ORLEY. The two artists differed in age as in character, and each had his own province in art, but they were among the few who had ventured on a voyage to Italy, and they could compare

sionate appeals from DÜRER. In that city he was suspected to be as little zealous about Catholicity. It was not safe for a philosopher who was not one-sided to remain there, and accordingly ERASMUS departed from Brussels. But his friendship with the VAN ORLEYS compromised the whole family in the eyes of the guardians of orthodoxy. There were other incidents which were likewise made grounds for suspicion. Apparently the artists and their wives were subjected to an investigation, and they may have escaped with a reprimand through the intercession of princess-



BERNARD VAN ORLEY. *From the portrait by Albert Dürer.*

notes about the genius and character of RAPHAEL, who had died in the preceding year. DÜRER must have been favourably impressed with the Flemish painter, for he drew a remarkable portrait of him in charcoal which he afterwards reproduced in oils. By the kindness of M. PAUL LEROI we are enabled to give a copy of it. There can be little doubt that in 1521 BERNARD VAN ORLEY was a young man.

A short time previously another great man, viz. DESIDERIUS ERASMUS, appeared in Brussels, whose apparent lukewarmness about the Reformation had drawn many pas-

regent. But some writers have stated that BERNARD lost his court appointments. If he experienced some of the disfavour of the rulers, he quickly regained it, for in 1531 MARY of Hungary, the successor of MARGARET of Austria, selected him as painter.

Among other commissions from his new patroness was one for a series of designs illustrative of the chase, which were to be executed in tapestry. The drawings are now in the Louvre, and have been reproduced in M. WAUTERS's book. They form an invaluable and unique series illustrative of what was then a royal sport. The designs reveal a

power of representing action and giving animation to scenes which might be supposed to be outside an artist's experience, that could not be inferred from VAN ORLEY's scripture pieces. No less remarkable are several which were intended to glorify the prowess of the imperial troops. In both cases VAN ORLEY appears to have been most careful with costume, and on that account his designs must have been considered as realistic by his contemporaries. Another aid towards producing that impression was his skilful introduction of existing buildings. The backgrounds of some of the hunting-scenes are accepted as authoritative evidence of the appearance of Brussels in the sixteenth century. There can be not the least doubt that VAN ORLEY was an adept in architectural designing. Many of his paintings wherein he introduced imaginative structures are marvels on that account. Some of the Belgian architectural societies would do well to study and treat of that part of his work. Several of the buildings that appear in VAN ORLEY's paintings in the Brussels Museum are not only beautiful in detail, but show so much restraint in keeping fancy in subordination to practicability, that we might suppose them to have been derived from the designs of an architect who was so capable to express the Renaissance spirit as to be considered a visionary, but was feared as one who was sure to bring clients to ruin by his extravagance. VAN ORLEY was the only man who was able to realise the suitability of MANTEGNA's *Triumph of Cæsar* as a subject for the frieze or panels of a building, but nobody in Flanders or elsewhere has had the courage to adopt his suggestion.

Students of art who are desirous to have a most careful analysis of VAN ORLEY's principal works will find it in M. WAUTERS'S book. He has no exaggerated belief in the genius of his subject. His whole endeavour is to secure for VAN ORLEY the position in the history of art which should belong to him if justice is allowed to rule. It is by his works alone the Flemish artist must live. About his life the most patient research by M. WAUTERS can discover little. The few circumstances which have done duty as biographical details in many books will not sustain scrutiny. The date of the painter's death is less uncertain than that of his birth. It occurred on January 6, 1541-42, and the body of the great artist was deposited in the chapel of St. Maur in the church of St. G ry.

PAGAN SEPULCHRAL MOUND, NEAR BRAY, CO. DUBLIN.*

BEFORE touching on the subject of this remarkable "find," it will be well to state how the discovery first came under my notice. The facts are as follows:—One day in August last, while engaged in cataloguing a portion of the antiquities belonging to the Royal Irish Academy, now deposited in our National Museum, Kildare Street, I was waited upon by the Rev. R. Scriven, secretary to his Grace Lord Plunket, Archbishop of Dublin, by whom I was placed in communication with the Hon. B. John Plunket, son of his lordship, who wished me to report on the general features of the discovery. Upon asking how it was that I had the honour of being so selected, the reply came that, "As hon. secretary for South Dublin, Old Connaught was clearly within my diocese."

A few introductory remarks may not be here out of place. It need scarcely be surprising how recent and imperfect is the knowledge we possess of sepulchral and other usages practised in Ireland amongst the archaic tribes by whom this island, as indeed that of Britain, would seem to have been first occupied. Our antiquarian writers of the last century, and, sad to say, of the earlier years of the present, as a rule, were given to indulge in extravagant statements which they boldly published, and in a manner dared their too confiding readers to challenge. A time, however, gradually arrived when, by careful examination of our ancient monuments themselves, much of the obscurity in which their character had been involved became dispelled. The result so far is very promising. The cromleac is no longer held to be a Druids' altar constructed for purposes of human sacrifice; its sepulchral character has been sufficiently and completely vindicated by use of the spade. The stone circle, so long regarded as a Druidical temple, in like manner resolves into the character of a mausoleum. The great Fingollian stone forts of Aran and the west have been assigned to their proper place in the catalogue of Irish monuments of remote antiquity, and have ceased to be looked upon

as sites of early Christian monasticism. The true story of our famous round tower belfries has been ably told, and the wonder now is that their exact character could so long have remained in doubt. Our so-called Danish forts, by which the face of Ireland is mottled, cannot now be looked upon as Scandinavian works—they are Danaan, not Danish. As with the cromleacs and circles, the mystery in which they were shrouded has, in a great measure, been dispelled by agency of spade, shovel and pick. In one branch of archæological investigation, within the last forty years also, vast strides have been made. I would particularly refer to the question of the crannogs or lake dwellings, of which at least 180 have been found in this country, and have been more or less ably described. Materials throwing light on the progress of ancient culture in the British Islands generally, and in Ireland in particular, come to light almost daily. Indeed, as already intimated, much has lately been done, and in essaying to trace back the long line of our ancestry through their handiwork, we are enabled even now in goodly measure to extend our view beyond the horizon of the farthest stretch of hazy tradition.

Most of my hearers are doubtlessly well acquainted with the more common forms of sepulture of early date as found in Erin; that is to say, the cromleac, the stone circle, the cist-bearing mound composed of earth mixed with stones, the chambered cairn, as at Newgrange, Howth, and many other localities; the plain cist, without mound or circle, usually enclosing a sepulchral vessel, and a quantity, more or less, of calcined human bones, often intermixed with those of some of the lower animals, most frequently those of the dog. The stone cists or chambers in which earthen and occasionally stone sepulchral vessels appear, are of various forms and sizes. In general they are simply rectangular, composed of large flags placed on end, and roofed with similar stones generally of considerable size. Be it remarked that along with the vessels and burnt bones entire human skeletons, or portions only, not unfrequently occur; these as a rule show no action of fire. It is not necessary for the purpose of my present communication to describe at any length the varieties and characteristics of ordinary mortuary structures as found in Ireland. I hope this evening to draw the attention of our meeting to a peculiar form of archaic monument which appears hitherto almost entirely to have escaped the notice of Irish antiquaries. I refer to a sepulchral mound situate on the grounds of Old Connaught, near Bray, in the demesne of his Grace the Archbishop of Dublin. As far as I know but one such mausoleum had hitherto been noticed. The exception occurs not far from the village of Blacklion, on the borders of Cavan and Fermanagh.

It has frequently been remarked how fond the primitive inhabitants of Erin were of selecting crowning eminences as sites to form the last resting-place on earth for their dead. On a beautiful slope commanding a grand view of the Dublin and Wicklow Mountains and of the sea stood, and still in part remains, a knob of glacial formation somewhat conical in form, and composed, of course, of yellow clay and water-worn boulders. This natural hillock, which, by-the-by, is environed by a broad ditch, would seem at an extremely early period of society in Ireland to have been used by natives of the locality as an eminence upon which to stretch their dead, over whom they spread a layer of earth varying in thickness from about 4 to 6 or 8 feet. It is only in the darker coloured and artificial portion of the mound that human or other bones and work of man's hands occurred. At least five skeletons lay extended on the glacial clay, and, as far as I could ascertain, no remains of cists were found about them. In the superincumbent earth, artificially raised, occurred an immense quantity of the bones of the old Irish long-nosed pig, of deer, goats, short-horned cattle, and probably of other animals, all of them which had contained marrow being split and open, no doubt the relics of a great funeral feast or feasts.

Much wood charcoal occurred at various elevations, and all over the mound, or rather within its artificial portion.

It must, I believe, for ever rest a doubtful question whether this place of graves was a settled cemetery for a chieftain and his family relations, &c., or whether the interments may not rather point to a scene of violence in which not a few human lives were lost. The preponderance of evidence is this—that the spot had been selected as a *fert* or *tuaim*, i.e. burial-place, by members of some long-forgotten clan or tribe who had their being in the old old age, when bronze was sparingly used, and when stone, bone and shells were still in requisition as materials in the manufacture of weapons and personal appendages, the term ornament, in this connection, being scarcely admissible.

Unfortunately I am at present unable to produce more than one of the human skulls, and portions of one of the skeletons, which, I may state, were unearthed by labourers engaged in raising gravel. These had been secured and secreted by members of his Grace's family. Others may yet be recovered, Mr. Plunket having kindly promised to do all in his power to cause them once more to be brought to light. The specimen on the table is, no doubt, characteristic of a

* A paper read by Mr. W. F. Wakeman at a meeting of the Royal Society of Antiquaries of Ireland.

primitive long-headed race by whom the majority of our pre-historic monuments of earth or stone were constructed. That these people had not made much advancement from an extremely rude condition is clearly indicated by the character of some of their handiwork which accompanied the osseous remains. Many portions of coarsely designed and imperfectly baked earthen vases occurred; these were, doubtlessly, pieces of food-holders which had been used during the celebration of funeral rites. They resemble in every respect fragments of archaic vessels found on the sites of early settlements on the northern coast of Ireland, as at Ballintoy, county Antrim. Several perforated stones and some marine shells prepared for stringing had, in all probability, formed portions of necklaces or of armlets. About one-half of a stone bracelet rewarded a careful search among the *débris*. There were a few roughly-fashioned bone pins and parts of two fibulæ formed of bronze. Some mould-like objects, consisting of baked clay, also appeared. One of these, unfortunately imperfect, was obviously used in casting sword blades, such as we are familiar with in bronze. Another, a small slab, is highly remarkable, exhibiting, as it does, upon one side a groove into which something like an inscription appears to have been scratched while yet the clay was soft. The characters are extremely similar to some described by the late Sir Samuel Ferguson as occurring on the cromlech of Lennore, county Tyrone.

Perhaps some of the most curious of the objects discovered in the mound are a couple of small slabs of stone which exhibit, in miniature, scorings, evidently artificial and executed with intention, exactly analogous to many of the rude rock-markings so common in not a few districts in Ireland, a kind of work which has for years resisted the best efforts of some of our most accomplished antiquaries to decipher or explain.

It is intended that an exhaustive and detailed account of the contents of the mound shall be published, with illustrations. In the meantime antiquaries will be glad to learn that, owing to the watchful care over the diggings (which, by-the-by, are still in progress) exercised by the Plunket family, including his Grace the Archbishop, it is not likely that any object of interest which may occur during future operations will be lost to archæological science.

TESSERÆ.

Horizontal and Perpendicular Effects.

IT is curious how differently we are impressed by expansion in the horizontal and expansion in the perpendicular plane. Take a section of Holland spread out horizontally before the eye, four miles or five in length and one or two in breadth, and it is but a flat, unimpressive plain. But elevate this small, unimpressive parallelogram of land to an angle of 60 deg. with the horizon, and it becomes the most sublime of natural objects; it surpasses Mont Blanc—it is the side of Chimborazo. Set it on edge and it would overwhelm the beholder with its sublimity. It would be the Himalaya Mountains cut down from their dizziest peak to the level of the ocean—a precipice so sublime that the mind would shrink in terror from its very recollection. Now, why does this section of land, which would be but a small portion of the extent of flat plain under the eye, at once from any little elevation, such as a dyke or a church tower in this country, pass from the unimpressive through the beautiful, the grand, to the utmost sublime, by mathematical steps, one may say, and according to its angle of elevation? The only solution of this fact in the sublimity of natural objects is that terror is not, as has been assumed by Burke and our greatest philosophers, the cause of the impression of sublimity in the human mind. Terror must be the effect of the sublime, not its cause, source or principle. In this supposed instance of the sublime in nature, power is evidently the cause of that impression—the intuitive mental perception that great unknown power has been exerted to produce this sublime object. It is the feeling or impression of this vast power which produces that feeling of terror allied with and considered the cause, although in fact only the effect, of the sublime. This impression of power received from any great and rare deviation from the usual makes the perpendicular more sublime than the horizontal, the Gothic cathedral than the Grecian temple, the mountain than the plain, the cataract than the lake, the storm than the calm. Unusual vastness, such as the great extent of flat country seen from any of the church towers in Holland, is also an expression of power and is not without its grandeur; but it never reaches the sublime, because the mind, accustomed to the sight of extension developed horizontally, perceives not the principle of power in it at once. This sentiment of power may possibly have something to do even with our impression of the beautiful in natural objects. The waved line—Hogarth's line of beauty—is agreeable, and the angular, broken or jagged line the contrary, because the one expresses a continuity of power in its formation, the other a disturbance or break in the action of the forming power. The latter would reach the sublime if the disturbance or break were on a great scale, indicating vastness of power.

Fifteenth-Century Furniture.

Wooden furniture of the earlier Mediæval epochs seems to have been very heavy and massive; huge tables of oaken planks fixed and immovable in their places, heavy benches or settles, and large coffer, cupboards and wardrobes ornamented with several ranges of intersecting arcades one above another, with their respective little shafts, bases and capitals, and other architectural members. In the thirteenth and fourteenth centuries, however, architecture is found to completely dominate over furniture; at which period the Gothic or Pointed style became a system as complete and uniform as the ancient Classical developments. The chief members of these latter styles were entirely constructional, massive, great and special to building. In Gothic architecture, on the contrary, the leading features are made up of an aggregate of minor details; an exuberant richness and elaboration of parts veiled the necessary constructional forms, constituting, as it were, a superadded embroidery, which was as pertinent to the simplest article of furniture as to a church; pinnacles, cusps, crockets, tracery, small buttresses, &c., and all the leading decorative motives following, in their developments in furniture, precisely the same modifications and variations in style as the architecture of buildings of the several epochs. In these periods sculpture was the dominant art; consequently, ornamental furniture was generally decorated with elaborate carving, sometimes, however, enriched or picked out with gilding and colour. During this period likewise commences the more extensive employment of rich stuffs, brocades and velvets in the covering of surfaces. Canopies, as appurtenances of state and personal distinction, whether combined with curtains or surmounting chairs, stalls or couches, now also come prominently into use. It is not, however, till the fifteenth century that we can proceed on certain grounds, aided by the study of existing examples. During this period, as the feudal system declined, and the arts of peace became more specially cultivated, an increasing luxury of furniture was everywhere manifested. The architect or the freemason, who, with his workmen, was in earlier times liable to be forcibly impressed by the monarch or his great barons, and required to build alike the castle and to fashion its rude and massive furniture, was henceforth no longer the sole artist. Carvers and cabinet-makers, workers in metal and weavers at their looms, all exercised their trades under the safe protection of their several guilds and companies, and became accustomed to co-operate in the production of elaborate works. Besides the ornate architectural arrangements in wood-carving, the smiths' or locksmiths' work now became conspicuous in articles of furniture, desks, lecterns, &c., in metal being by no means uncommon, whilst the locks, hinges, &c., of wooden furniture were often wrought with the utmost skill and beauty. It is worthy of notice that the metal-work of the Gothic period is chiefly "wrought," the hammer and file working together rather than the chasing tool.

Influence of Italian Architecture.

In the fifteenth century such was the reverence of men for the revived works of ancient literature and science that the profession of the Italians, that they had restored ancient Classical architecture on the precepts of an architect of the Augustan age, was sufficient to open the way for them all over civilised Europe. In the course of that and the following century Italian architecture was adopted and Italian architects employed in France, Spain, Germany, Great Britain and their respective dependencies, and now in the nineteenth century Vitruvius and Palladio are as predominant on the shores of the Baltic as on those of the Mediterranean Sea, though in this country and in some parts of the Continent their influence is considerably diminished since the time of Inigo Jones and Claude Perrault. The Cinquecento was later in gaining a footing here than on the Continent, in consequence of the existence of a beautiful national style of architecture, which our ancestors do not appear to have been induced to resign to the barbarian innovators of the South as readily as the inter-jacent nations were to give up theirs, for which indeed the reason exists in the greater attractions of ours and the consequent greater difficulty of inducing the nation to part with it. The French, though they received the Vitruvian architecture from the Italians, were patriotic enough, as soon as they had acquired its principles, to confine the practice of it almost entirely to native architects, in whose hands it assumed a different character from that which it possessed in Italy and became what may be called the French style of Cinquecento. Its ecclesiastical structures are less faulty than are those of the corresponding period in Italy, but its secular edifices are as far inferior to those of that country. The grand palatial style, which is exemplified in the Farnese Palace in Rome, never found its way into France.

The Thirty-third Annual Exhibition of the Glasgow Institute of Fine Arts will be opened on Monday, the 6th prox., by a conversazione. There will be no private view.

NOTES AND COMMENTS.

A SHARE of the indemnity derived by Germany from France after the war of 1870-71 was set apart for the erection of an Imperial Parliament house in Berlin. It amounted to 24,000,000 marks, and was put out at interest until 1877, when a new arrangement was made. The share had by that time increased to 28,719,964 marks. Up to the present the outlay on the building has been 27,925,000 marks. The Reichstag Palace has, therefore, not needed an appeal for supplementary votes, and this fact suggests the rigorous organisation which extends to civil no less than to military affairs. There is not only a balance of 794,964 marks, which can be utilised for imperial purposes of another kind, but a sum of double the amount is likely to be obtained from the vacant land which was not built over. It has been stated that the building has not gained the approval of the Emperor, but the financial aspects of the undertaking deserve to be recognised as satisfactory.

In the majority of cases if a store full of theatrical scenery caught fire everybody would say such a consummation was to be expected. The Opera House of Paris is, however, a national institution, and the destruction of the scenery on last Saturday night, which will make it impossible to represent "William Tell," "L'Africaine," "The Prophet," "Robert the Devil," "Aida," "Romeo and Juliet," "Hamlet," "Henry VIII.," "The Jewess," "La Favorite," "Don Juan" and other works, about thirty in all, during several months, is a public calamity not only for Parisians but for visitors to the French capital. Yet the citizens should be thankful for the destruction being so limited. A magazine of the kind was a source of danger in the crowded neighbourhood around the Rue Richer, and if the wind had been unfavourable there must have been a large destruction of property. The fire will probably determine a question that has given rise to much discussion. Extensive as is the Opera House it can contain only a limited supply of scenery. According to the regulations, scenery for more than seven operas is not allowed in the building. As the directors considered the quantity was too limited, the public authorities have connived at an infraction of the law, and in consequence scenery for eleven operas has been saved, including the colossal terrace for "Salammbô." It has long been maintained that an adequate building should be erected to store scenery which every year seems to be increasing in area. That would mean an application of the public funds to a purpose which is supposed to be irregular. Much as Frenchmen admire the Opera House they grumble at further taxation to uphold it, and prominent citizens have gone so far as to advocate the demolition of the costly building and the utilisation of the site for commercial purposes. Further time cannot be allowed for playing with the question. Saturday's fire has demonstrated the risks of scenery that was supposed to be unflammable, and the re-establishment of the store in the Rue Richer or in a similar locality would hardly be endured.

THAT foreign contracts can turn out as heavy losses was revealed by a case which was heard in the Edinburgh Court of Session a few days back. In 1886 the Glenfield Company, Limited, Kilmarnock, was informed by a firm of "negotiators of foreign contracts" in Manchester that waterworks were to be constructed at Braila, in Roumania. The company tendered and obtained the contract. The cost exceeded the sum received to the extent of 42,000*l.* It was agreed that a commission of 2½ per cent. on the contract price, or in all 818*l.* 16*s.* 6*d.*, was to be paid to the negotiators, who were to divide the money with their agents or correspondents in Braila. The sum of 659*l.* 8*s.* 3*d.* was paid by the company, leaving a balance unpaid of 159*l.* 8*s.* 3*d.* The negotiators claimed 651*l.* 14*s.* 9*d.* as still due, and brought an action to recover the money. The judge decided that the total commission was to be 818*l.* 16*s.* 6*d.*, for nothing was said in the agreement about paying commission on any extra works. With respect to the balance of 159*l.* 8*s.* 3*d.*, the Glenfield Company stated that it was allowed for by the local agents in a settlement of accounts with the company, and the judge held that all the company need do was to relieve the negotiators from

any liability to their agents for that amount. The Glenfield Company accordingly won the action, and were allowed costs.

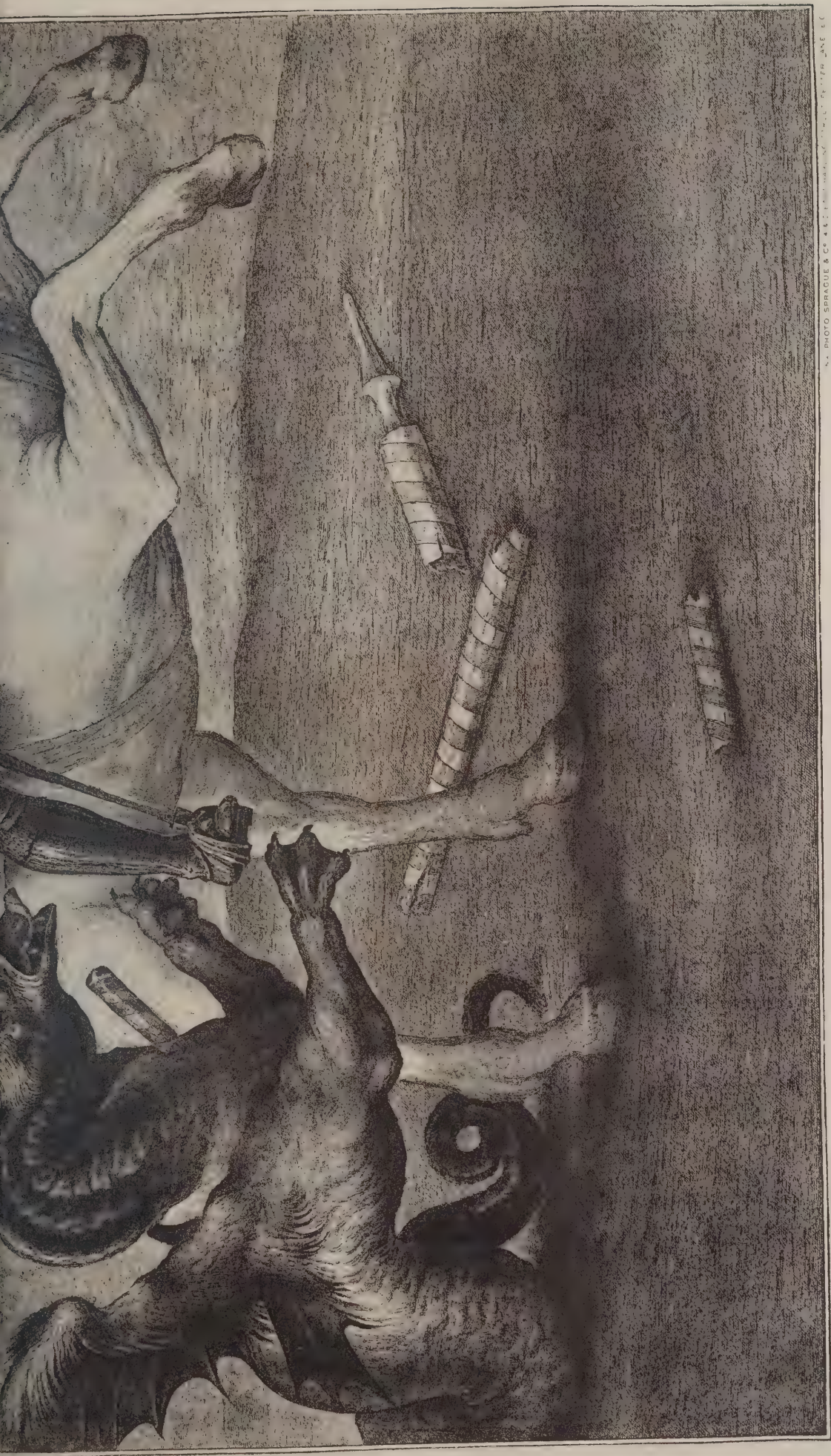
THE photographic survey of Warwickshire appears to be producing satisfactory records of old and new objects. During the last year over five hundred plates were added to the collection, which is preserved in the public library, Birmingham. The President stated at the annual meeting on Tuesday that the city was fully appreciative of the work that was being done, but he thought more was expected. He urged them, for their own credit and for the good of the town, to continue the work. From all parts of the country he had received letters asking for advice as to procedure, with a view to other local associations being formed, and he was hopeful that before they met at their next annual meeting a national photographic survey would be established. That would reflect credit on the Birmingham association, and would place it above most other associations in the country. There is no doubt that Birmingham set the example, which deserves to be generally imitated. Hereafter the plates will be invaluable for the archaeologist, topographer and historian. They show what can now be done by co-operation without a large outlay of money.

THE American expedition to the supposed site of Babylon has been sufficiently successful to encourage further efforts. The mounds on the plain of Niffer to the south-east of Babylon, which are supposed to be remains of the city of Nipper, in the building of which, as at Troy, the gods were supposed to assist, were first attacked. Vases, tablets, amulets, stamped bricks, fragments of construction, &c., have rewarded the explorers. An inscription, which relates to SARGON, the oldest Semitic king, is considered to be invaluable. Hitherto his name was only associated with a legend about his deliverance from the waters of a river on which he was floating in a basket. Now he has become a historic personage. Whether he lived 3,750 years before our era remains to be proved. There is much else of archaeological interest which will be announced by the directors of the expedition.

HENCEFORTH *L'Art* is to be produced with pages that will be about one-half the size of those which have become familiar to artists and amateurs throughout the world during nineteen years. The new form is more convenient, especially for subscribers who cannot increase the size of their libraries. It will also enable many improvements to be carried out. The first number of the new series is so attractive in appearance, it is sufficient to persuade the most conservative subscriber that the change in form will be an advantage for him. But an increase of convenience will not be the only consequence. The etchings which have gained so much appreciation are to be forwarded on rollers to subscribers independently of the periodical. The proprietor and editors will therefore be no longer restricted by the size of the pages, and plates on a grand scale will be produced. With the new number an etching from the painting *Maternité*, by Mr. HITCHCOCK, the American artist, which was exhibited at the Royal Academy, and a fine lithograph after M. CAZIN'S *Hagar and Ishmael* are presented. They are worth the sum charged for a whole year's subscription. The contents of the number are varied, and there is an abundance of illustrations. Among the articles is one on DE LEMUD, who was one of the greatest of the French artists in black and white; another on some pastels of DE LA TOUR; and an account of the robbery of The DU BARRY'S diamonds, an affair which was among the minor causes of the French Revolution. There is little doubt they were entrusted to the care of a firm of bankers doing business in Pall Mall, opposite Marlborough House. What became of them is a question which still awaits solution. The favourite made four voyages to London in search of her treasures, which were worth a million and a half livres, or francs, and in consequence was suspected of conspiring against liberty with the English, and was duly guillotined. The number of *L'Art* could not be easily improved, and it promises well for the quality of the new series.

The Architect. Jan. 12th 1894.





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Saint George,
From the Painting by Raphael in the Louvre, Paris.

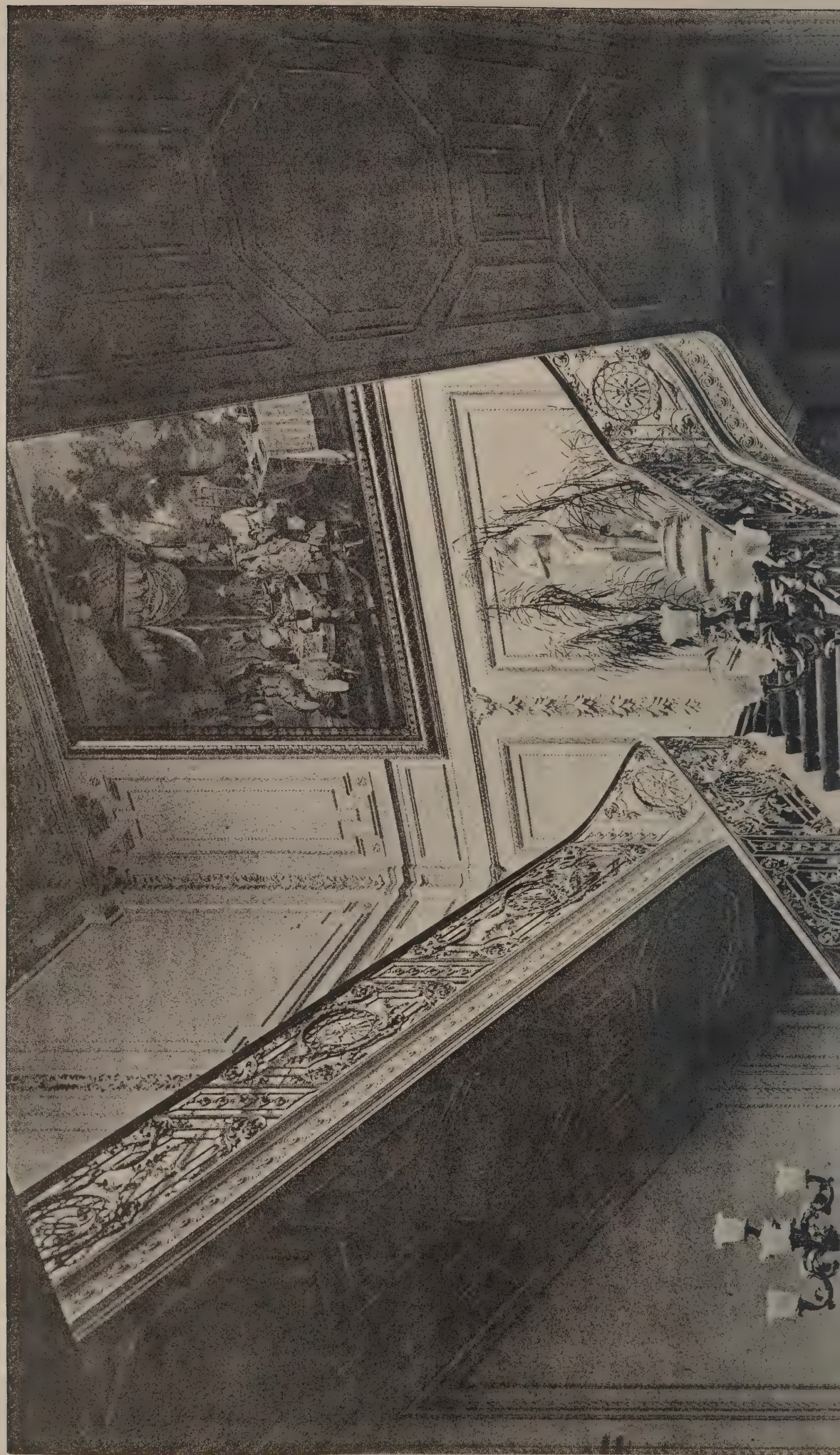


VIEW FROM BOWLING-GREEN.
DRAWING-ROOM.



SALON, FROM VESTIBULE.
CHINTZ BED-ROOM.

The Architect. Jan. 12th 1894.





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IN A PHOTO BY ADOLPHE & CO 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

"HALTON," HERTS.—THE FOOT OF GRAND STAIRCASE.

The Seat of ALFRED DE ROTHSCHILD, Esq.

ILLUSTRATIONS.

ST. GEORGE.

THE painting which forms the subject of the illustration is supposed to have been executed by RAPHAEL for GUIDOBALDO DE MONTEFELTRO, when the artist visited Urbino about 1504. According to tradition, the back of a draughtboard was used instead of a panel, but there are no traces of such a use to be discovered in connection with the painting. FÉLIBIEN asserts that the *St. George* was painted for HENRY VII. of England. Apparently he confuses it with another picture which bore RAPHAEL'S name in gold letters on the bridle of the horse. That picture was somehow obtained by the Earl of PEMBROKE, who parted with it to CHARLES I. in return for a collection of drawings by HOLBEIN. After the king's execution it was sold for 150*l*. It passed through several hands, and eventually found its way to the Hermitage Gallery, St. Petersburg. The painting we illustrate was purchased by FRANCIS I., and it is now one of the treasures of the Louvre.

CHARLES CLEMENT considers the *St. George* to be the first painting which RAPHAEL completed, to show he was emancipated from PERUGINO'S leading strings. He says that the fire, the vivacity of action, the accuracy of the movements, the beauty of the horse and the rider, the general harmony of the lines, the delicacy of the colouring, the charm of the landscape, the vigour, ease and grace of the composition, were indications of the style the painter was about to adopt, and it is not without emotion we realise in this juvenile but perfect work the beginning of a career that was to be completed in the great works of the Vatican and the *Transfiguration*. RAPHAEL did not possess a creative imagination. In composition he respected precedents, and the *St. George* is supposed to recall the relief by DONATELLO above his statue of *St. George* in Or San Michele, Florence.

GROVE HOUSE, HARROGATE.

THE new salon is 34 feet in length and 22 feet in height, wherein on the right is a stone fireplace rising to the ceiling, consisting of an open hearth, fire-basket and ornamental dogs, over which is a moulded and enriched cornice supported by two caryatids taking the form of mermaids sculptured in Portland stone, from the studio of Mr. FRANK TORY. The frieze is enriched by a representation of a hunting scene, while the whole is surmounted by Elizabethan pilasters and cornice. This apartment is lit by a stained-glass window, 11 feet by 7 feet, in nine panels, with subjects typical of mechanics, science and industry, conceived in a strong key of colour, of bold outline; also by a panelled ceiling-light filled in with rich glass-work from the studio of Messrs. CAMPBELL, SMITH & Co. A carved-oak staircase rises to the first floor, from which level a gallery runs on two sides. The ceiling of the gallery is in enriched plaster-work, the walls have a panelled dado, and the doors are finished with moulded pediments. The whole of this work is carried out in fumed oak, the newels and other portions of the staircase and gallery being richly carved. The drawing-room is 34 feet by 20 feet, having a bay and two other windows to the south, with two fireplaces. This room is finished in dead white with polished mahogany doors, having enriched plaster frieze 2 feet in depth, which also crosses the room at the centre, and is supported by four Corinthian columns. The chintz bedroom has an angle-nook, fitted with settees upholstered in silks. The dressing-rooms are fitted throughout with baths and lavatories with tiled dados, Italian marbles and polished woods. The furniture throughout has been specially designed and made to meet the requirements of each apartment. This work has been executed from the designs and colour schemes of the architect, by Messrs. MARSH, JONES & CRIEBB, of Leeds. The exterior elevations have been carried out in local sandstone, and made to tone in colour with the stone-work of the old house, and designed in harmony with the old work as far as the requirements would allow, the roofs being covered with red tiles. The new kitchen wing has received a somewhat lighter treatment, and half-timber gables have been freely introduced, the roof being again covered with

red tiles. The expenditure in connection with this work has been over 31,000*l*. Mr. T. BUTLER WILSON, of Leeds and Harrogate, is the architect.

HALTON, HERTS.—FOOT OF GRAND STAIRCASE.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. Owing to the inclement weather the attendance was sparse.

The following gentlemen were elected as members, viz.:—Messrs. R. A. Hinds, C. W. Surrey, F. H. G. Fothergill, W. W. Farthing and W. H. Ward.

Mr. OWEN FLEMING said that in accordance with a notice given at the meeting of the Association on December 8 last, he had intended to propose that evening, "That a special committee be appointed to inquire into the present facilities in London for the training of artisans belonging to the building trades, and to consider and report if, and in what manner, the Architectural Association can exert its influence in the organisation of a complete scheme of education and its future supervision by architects." He found, however, that the committee wished to give the matter more careful consideration, and had requested him to postpone his resolution till the next fortnightly meeting.

The PRESIDENT said the committee were by no means opposed to Mr. Fleming's scheme, but wished for further time so as to make the scheme more workable in its details.

Mr. A. O. COLLARD read the following paper on

The Difficulties of a Young Architect.

Mr. Collard said:—I am not sure at what period an architectural student first considers himself entitled to put the word "architect" after his name, nor does it much matter, as his friends and the public generally succeed in finding out, and learn in time to distinguish very well between his claims and those of such people as the West End sweep, who actually painted the word "architect" on his sooty signboard because of his duties in connection with chimneys.

It is scarcely needful to dwell at any length upon the pupilage stage, except perhaps to remark how few articulated apprentices seem to realise at the time that their future largely depends upon how they employ their time and opportunities when they are young, and that if they waste either it will be terribly hard to make up leeway afterwards. Those are fortunate who, having a natural bias towards artistic things, succeed in entering a good office, and have in other respects congenial surroundings, an able master, and associates willing to impart information. They are less to be pitied, if unsuccessful, than others less fortunately situated, whose commencement may contribute to a similar result through uncongenial surroundings, with small opportunity of receiving that artistic nourishment which is sometimes so lamentably absent. Not that I consider an indifferent office is necessarily bad for a beginner, for at any rate he would probably learn some things very useful in after life, and if he is worth anything at all he will soon find out for himself what is lacking and make up the deficiency. That is the easier nowadays, since we are surrounded with the means of acquiring the groundwork of architectural knowledge, of which the new curriculum of this Association is by some considered the best.

The time wasted by many pupils is fearful, and they, more than their principals, are responsible for it. Pure laziness is the cause of it, I am afraid, though that evil is not, I fancy, so apparent as it used to be.

The life of the improver and the assistant, two stages which some youthful geniuses strive to evade, and in a few cases successfully, though with eventual good to themselves I doubt, are not so bad as many make out. Salaries, it is true, are small, but not more so, I believe, than in most other arts and crafts nowadays, and the opportunities for improvement and gaining experience are many. It is frequently not till a student becomes a wage-earner that he fully discovers his weaknesses, and it is at this period he generally makes great strides in the profession he has adopted. My advice to all pupils on completing their articles is to try very hard to get into a good office, a few of which they will by that time have learned the whereabouts. If they wish to some day practise on their own account—and who do not?—avoid like a penal settlement the chance of an appointment in some public department. The salary may be attractive, but the monotonous routine saps the energies and lessens the once strong desire to fight a way in the world, and gain such measure of success as devotion to his work should bring to a young man. If one can judge from a recent advertisement issued by a public office, the gilded bait is not quite so attractive as it was, for an estimating and measuring clerk is offered 250*l*. a year, while an architectural draughtsman

is to be tempted with 2*l*. a week. A good introduction, a few really good specimens of draughtsmanship and perseverance in spite of rebuffs, will usually gain the entry to a desirable office, such means being perhaps preferable to those used by an assistant in America, who when he was out of work and hard up, walked into an architect's office and successfully demanded employment, his two chief recommendations being a thick stick and a fierce bulldog.

Various reasons may cause a draughtsman to take the plunge into private practice—a desire for emancipation, the offer of a private job, the fact of being out of a berth, having won a competition, or a solid confidence that work will tumble in if only the brass plate is fixed up. Or he may gradually accumulate friends and clients while still working all his time or part with another architect, sharing an office meanwhile with some intimate friend; this latter arrangement giving him frequent chances of talking over knotty questions with someone he is not too shy to consult.

At any rate, having determined to make a start, say, in London, the choice of an address is by no means unimportant. The convenience of clients should be a consideration and first thought, and the effect of even an easily-remembered postal address need not be overlooked, nor the abbreviation if necessary of the too many Christian names or initials with which some thoughtless parents provide their offspring.

Having made a start, however clever an architect may think himself, time, and time only, can bring that ripened experience which enables a man to grasp a subject easily and quickly, and grapple with the difficulties successfully which scare a person of small experience. I would say to all beginners, when in doubt or difficulty which you cannot exactly see through, go at once to an older practitioner, and gain from his ample store of knowledge the information you require. I believe it will be found without exception that our elder brethren cordially render every assistance to those who seek their advice.

To attempt to bluff a client with pretence of knowledge, or Pecksniffian fudge, as it is sometimes called, is little use, so if you don't know, go to some one who can tell you.

Various kinds of architectural work are before you, and those are lucky who can pursue the particular kind which their taste prefers or their skill and education enable them to tackle best. Circumstances or accident may, to the easily led, dictate a particular class of work, but, on the other hand, any one who firmly resolves to strike out in a certain line will, in time, probably gain his desire. Church work, public buildings, theatres and music-halls, schools, houses great and small, in fact, any building with a roof to it, have their attractions and require special study. There are those who find competitions suit their tastes, a form of speculative excitement which may be distinctly objectionable to others, though it would do even the latter no harm to occasionally have a throw at the architectural dice. Success in competitions, however, seems to be to the few specialists, and the steady jog-trot of private practice has sufficient variation for most men. Having in the course of my comparatively brief experience only gone in for one competition, though that was a success, I am not in a position to say anything on the subject generally, and I will leave it to others present to point out the difficulties in connection with this branch of work, and to give some valuable tips in dealing with public committees and boards, the chief, and perhaps the only, point impressed on my mind being the necessity of having an appointment made under seal to insure payment for services rendered.

While clients are few, and jobs far from numerous and remunerative, there is the chance that some older or more fortunate friend may have more to do than he can comfortably manage himself, or in his own office, and may hand some of it over to his needy and thankful brother-T-square, who need have no reason to be ashamed of taking in washing.

Speculative work—that is to say, preparing plans for a building to occupy a certain site, for which building you might also have to find a builder or other person willing to lay out capital—is thankless work, and I believe disagreeable from beginning to end. You may very likely have your work for nothing; or, even if the building is eventually erected from your drawings, you may have little or no control over the builder, who, when he has paid your fees, proceeds to carry out the design as he pleases, and may so distort it that, like Queen Victoria when she once drove past Buckingham Palace, you may inquire, "What building is that?"

The manner of obtaining work seems to rest a good deal with the man who wants it. The possession of private means does not insure it, nor does exceptional brilliancy always do so. To sit in an office and expect work to roll in by some automatic process is to expect too much in these times of keen competition and over-population. As a rule, the young architect has to seek work outside his office by making his wants and abilities known among his friends and relations. The more of these he has the better. To make friends comes naturally to some people. I have heard that teaching in a night-school is labour in this direction not thrown away, though I do

not speak from personal experience. Many forms of sport and pleasure, the social or political club, devotion to one's future welfare, the filling of public offices, the frequent use of the voice and pen in debate and controversy; all these and many other methods are employed with advantage. The press is found by some to gain them the object they desire, namely, notoriety; and even the House of Commons occasionally has a contribution from our ranks. The preparation of pretty pictures for the walls of the Royal Academy gives employment to many of our most skilful draughtsmen, though it is a lamentable fact, the public do not yet seem thoroughly to appreciate the attractions of the architectural chamber. The various building journals give a wide circulation to much work that is good, and when it is so it is warmly welcomed and appreciated. It would perhaps be well if the editorial censorship were more strictly exercised, though, on the whole, young architects might have a new difficulty to contend with if a tribunal or arbitration board had to decide these matters of taste instead of an editor. I would say to young contributors, consult a few intimate friends before you publish designs, for you, of all people, may be the least competent to estimate the quality of your own efforts. I have briefly referred to a few modern ways of obtaining work. Before passing from this branch of our subject, it may be refreshing to remember some architects who have done, or who are still doing, much work and good, without wishing or needing to attract attention beyond the ever-increasing circle of their *clientèle*. The name of one architect, now, alas! dead, suggests itself, who was scarcely known to his fellow-craftsmen, who never published a sketch or drawing, numerous and admirable as they were, breathing the soul of a true artist, but who, nevertheless, enjoyed a very large practice among the best of clients, and lived the most retired life imaginable. Under such conditions, good results seem more possible than in the case of an architect rushing hither and thither, never happy unless immersed in public functions and mentioned in the papers. One point is worth passing reference here, and that is the necessity of not becoming an architect for the mere purpose of earning a living. No more disastrous reason could be chosen, and if that is the sole reason that animates any young architect, he had better by far change his vocation. There are other callings where that object is the only one that need be seriously entertained. You will remember what Professor Garnett said in this room a few weeks ago, when speaking of workmen. That "the man who worked under the pressure of dire necessity to provide the means of nature for himself and those depending upon him, was little better than the slave who worked under the slave-driver's whip. He only was a free man who did his work because he delighted in it; and who did his work as well as he possibly could, because he would have thought it a disgrace to do it in any other way." It would be well if this statement of affairs could be clearly impressed on all who propose to devote their lives to the study and practice of architecture.

The doing of work which by degrees finds its way to a beginner's office is our next consideration. It covers the preparation of drawings, writing specifications, drawing up contracts, interviewing clients and tradesmen, inviting and advising as to tenders, and last, but certainly not least, the carrying out of the approved designs, with the subsequent settlement of accounts. Securing the confidence of a client and enabling him to see that his confidence is well placed depends largely upon a promptitude in grasping his ideas and requirements, and if necessary directing them. A client comes to the architect with more or less acquaintance with his own wants, but as a rule expecting that knowledge to be supplemented by the skilled advice of the expert. He expects to be protected from mistakes of all kinds and to him inconceivable dangers. Too much patience cannot be displayed in pointing out what is undesirable and what impossible. Having come to a full understanding, sketch plans of the proposals can be prepared, a preliminary plan of the site having been made, levels taken, &c.

A thorough knowledge of materials and construction, of the relation of the proposed building to its surroundings and the tastes of the owner, a thorough comprehension of all legal enactments likely to affect the building—and these are sometimes neither few nor very intelligible—site, aspect, drainage and other things are necessary to the young architect to enable him to complete a design which shall be a credit to him as an artist and man of business and give his client satisfaction. If these conditions be fulfilled our youthful genius should, for the time being, be a happy man. This period of the work, if an architect be fond of his pencil and brush, is perhaps the pleasantest, and the many hours constantly spent in sketching, measuring and studying will all add to the enjoyment of his drawing-board. When, after sundry consultations and revisions of his plans, a scheme is finally approved and the word given to proceed, the designer has to put in operation the practical part of his attainments by writing such a specification as will properly describe and explain all that is shown, required and intended by the drawings for the building they represent. To many this is an irksome job

but it should on no account be relegated to other hands; the architect alone has had the advantage of personal consultations with the client and the architect alone knows, or should know, what is wanted, and is responsible for the result. Too much time and attention cannot be devoted to details to insure successful results, and great pains spent thus at the beginning saves endless difficulty, annoyance and very likely additional expense at the end. For instance, drawings should give as much detail and general information as the scale to which they are drawn allows. It is no use making them too pretty or highly finished, for the builder understands or appreciates little of that. What he wants is a clear set of drawings, neatly figured, with the different materials distinctly shown by colour. The same principle applies to specifications which, to my mind, are generally too elaborate and wordy. I think it would be very useful if some talented specification writer were to prepare and publish a few terse, everyday sets of specifications, and thus enable some of us to abandon the antiquated forms we seem to cling to so lovingly. The two trades which beginners stumble over most are, I fancy, the joiner and plumber. A few weeks spent in the shops would soon set this right. Going to another profession for an illustration of the advantage of studying things in detail, we may reflect on Mr. Hart's recent article on the late Sir Andrew Clark, in which he remarks that his illustrious friend "never slurred a point in any case and never passed over a detail which suggested itself to him as being capable of elaboration for the benefit of his patient." With us a client places both himself and his money in our hands and the responsibility is no light one. In doing the work, therefore, that a commission entails, the young architect is morally bound to devote his whole heart, soul and brains to it, not sparing himself.

In carrying out work the beginner may find himself rather at sea. If that be so he had best spend as much time as possible on the job, watching keenly all that goes on, making friends with the workmen, whom he will find as friendly as possible if rightly treated, and willing enough to tell all they know. Do this from the moment the first spit of earth is removed till the last coat of paint is applied. Although it is, perhaps, a little rough on the client, it is a first-rate thing for a young man to act as a clerk of works for a time. He will learn a tremendous lot and never regret it.

As pupil and assistant we are brought to see many difficulties which occur in dealing with builders, tradesmen and clients. But to the young architect these difficulties become far more real, and have a more impressing and depressing effect.

Builders, as a rule, expect to find young architects easy to manage, open to persuasion by emphatic reference to practical experience, and disconcerted by the evasion of some things which they think it safe to omit or too far gone to rectify. Firmness at the commencement of a job will impress such builders as these, and the condemnation of a bad load of bricks will have a wholesome effect. Reflection on any point which seems doubtful will enable the beginner to decide what is right and proper to be done. All builders are not like this, fortunately, but when you come across a really good one, do not lose sight of him. One case occurs to me where a builder having submitted a sample brick for some walling was warned not to use them. He thereupon remarked that at all events they would do for the footings, apparently not wishing to remember that place bricks are as much out of place in foundations as anywhere else, if not more so. So with all materials used in bulk, be careful to see they are up to specification, for more is to be gained by absence of quality there than anywhere.

The quality of materials used is one of the stumbling-blocks in superintending work. To specify the best is one thing; to see you get them is another. Inferior stone, brick and timber, bad joinery and plumbing, paint composed of a non-permanent mixture, mortar and cement bad to start with, and perhaps rendered worse by the weather, cheap foreign glass, with specks and flaws in it, ironmongery below specified prices, all give chances of future trouble. Extras, described as "the builder's aim and the architect's dread," are always on your tracks, and will total up in an alarming way if not firmly suppressed. It seems a wise precaution not to incur any additional cost without a client's consent unless clearly covered by a stated provisional item. Omissions, too, must be carefully noted, in spite of a builder's human nature to consider them fair plunder. Always warn a client when any variation suggested by him is likely to cause extra expense, and never incur the most trifling additional cost without knowing and settling the amount in writing. It is so easy to give a verbal order. But it is a trap for the unwary, as a few months hence will prove, when your memory and the builder's may not precisely agree.

In arranging the terms of a contract, it would be well if a young architect could have proper legal advice, though this is scarcely ever possible. When the Royal Institute of British Architects succeed in producing a well-drawn builder's contract, for which we have waited several years, the young architect may have something reliable to go upon, but till that happy

time arrives he must bestow much time and thought in preparing one which will, as far as possible, protect his client's interests, with fairness to the contractor.

Never forget the peculiar and delicate position you occupy towards both parties to the contract. The architect is at the same time agent and arbitrator, and must remember that fact from the moment the contract is signed.

In arranging the prices of such articles as require special reference in a specification, it is well to see, personally, the various tradesmen and their goods, select what is required and clearly understand and state whether the prices quoted are prime cost or net value, or whether list prices, which signify a profit allowance to builders. It is a little difficult to understand exactly why builders should expect a profit on things which sometimes give them no trouble to obtain, but the insidious practice, like tips, has obtained strong foothold. At any rate, you can see that your client pays no more profit than you choose to allow, and make your intention perfectly clear to both tradesmen and builders. In spite of your care, many builders will strive to obtain a further discount from the manufacturers, but that is the latter's affair, easily settled by an appeal to the architect.

Having the interests of a client at heart, it ought not to be difficult for an architect to secure his confidence and trust, but the difficulty is sometimes to retain them when affairs for the moment go not smoothly. Do not hesitate to differ from him, politely and firmly, if the necessity is obvious and essential, bearing in mind you may be held responsible for any mistakes which may result, even from the adoption of a client's own notions. Give all suggestions the same courteous consideration you expect for your own, and in all domestic arrangements never fail to consult the ladies—for they can be very bitter, afterwards, on points which they know probably more about than yourself, and surely have a right to discuss if they don't. Never quarrel with a client, or if you unfortunately do, don't round on him like the Duke of Buckingham's surveyor did, out of revenge, as described by Queen Katharine in Shakespeare's "Henry VIII." Whatever be your temperament, never show anger or displeasure, and use every endeavour to part good friends, so as to secure a client's lasting esteem for your manners as well as your talents. Architects now stand far better in the public estimation than they used to do, and it should be the constant effort of every young architect to increase that which is more to be prized than title or riches. "Louis XIV., once taking the air in one of his royal gardens, saw Mansard, the architect, walking by. He soon joined the old man, who took off his hat, as was strict etiquette in the presence of his sovereign; but the monarch lifted up his hand in friendly reprehension, and said, 'Pray keep it on, the evening is damp and you may take cold.' The courtiers, who were all standing bare-headed around the king, stared at this extraordinary show of courtesy. But Louis XIV. observed, 'Gentlemen, you are amazed, but learn this: I can make a duke or a marquis with my own breath, but God only can make a Mansard.'" Such honour is given to few of us, but we may all try to deserve it.

Giving estimates is a dangerous business, best avoided if possible. It is very difficult by cubing up a set of drawings, and pricing the result, to be sure of accuracy. Many gentlemen like to know, beforehand, what the probable cost will be, and in giving them an approximate estimate you are not unlikely to be far out of the reckoning. A client who can bear with equanimity the news that the lowest tender has come out much higher than his architect's estimate is a marvel, and on the other hand too high an estimate may prevent the job going out to tender. I have the honour of knowing a gentleman who, by some mental process unknown to me, always forms an estimate of his own, frequently nearer the mark than his architect's.

Always give a client notice of your intention to issue a certificate, in case his money may be temporarily locked up in securities, and he may not wish to realise on a falling market. In issuing certificates be careful to keep a sufficient balance in hand, and before you give a final certificate make sure your client has really got all he is paying for. Unless a job is a very small one, it generally suits a young architect to receive his commission at the same time as the builder gets his cheque, and many clients like this method, for there is a satisfaction in paying as you go.

The scale of charges issued by the Institute for our guidance is a very useful basis on which to rely, and a copy should be given to a new client before a job is begun. The public are satisfied with its fairness, whatever Lord Coleridge may think.

It is well to submit all contract drawings and the specification to a client for examination, and if a quantity surveyor be employed, let him know that too. Also, in arranging the quantity surveyor's charges, see that the stipulated payment covers the settling of accounts, for though clients, as a rule, do not object to pay for quantities being taken out, they fail to see why they should pay any more for accounts being made of the variations, oftentimes a tedious affair and as necessary as the other. Always ascertain who introduces a client, and thank

the friend. Keep out of disputes with adjoining owners and the authorities if you possibly can, and preserve all the arrangements with them in your own hands.

The by-paths of architecture are numerous, and often bring grist to the mill when it is most sorely needed. Our President referred to dilapidations and light and air cases in his opening address. It can do no one harm to be intimately acquainted with such things, so long as the main object is kept in view. Landscape gardening, designing wall-papers, fabrics, carpets and furniture are interesting, and these are subjects which young lady architects especially should be competent to shine in, apart from any other branches they may desire to pursue.

The combination of artistic instinct and business capacity are necessary for the complete architect; perception of what is beautiful and appropriate and what is ugly and out of place; an intuitive understanding and appreciation of form, colour, construction and materials. He must not neglect those more worldly things which entitle him to consideration as a man of business. He must show he appreciates the value of money, and can be trusted to arrange its disposal to the best advantage, artistically and practically. He must keep a diary. Reduce orders and instructions to writing. Keep copies of all documents and drawings. Arrange all papers methodically in pigeon-holes, boxes, cases, drawers and slides, easily accessible. Earn a reputation for punctuality in appointments, and avoid a reputation for exceeding estimates and allowing the accumulation of extras.

A young architect cannot be too well educated, and along with his other studies he should find time to improve his mind in general literature and in those subjects and accomplishments which will make him acceptable in society. He should not neglect the study of man, for all his life he will be dealing with men, and woe betide him if he fails to understand them. It is this study of man which enables engineers, solicitors, doctors and other professional men to gain their own way without causing unnecessary irritation. Leave nothing to chance, and never let questions of time or distance prevent proper attention to work. Do not be bigoted or stick to an opinion when some practical mind points out a mistake. Study your health. Have settled habits. Be at your office regularly. Dress neatly and well. Do not spend too much time at your club, if you belong to one, for the midday lunch is apt to expand into a two hours' lounge, so that when you return to your office the boy may say, "Mr. So-and-So called, and waited half an hour, but cannot call again."

The young architect has uphill work, but his future is mostly in his own hands, and difficulties will melt away if met with determination. So in the words of an ancient but unknown poet—

If at first you don't succeed,
Try, try, try again;
Time will bring you your reward,
Try, try, try again.

The reading of the paper was followed by a discussion, in which Mr. John Hutton, Mr. Thomas Blashill, Mr. Basil Champneys, Mr. Aston Webb, Mr. W. H. Atkins Berry, Mr. Henderson and Mr. Sidney Beale joined. A vote of thanks was passed by acclamation to Mr. Collard for his lecture.

BLICKLING HALL: ITS DRAINAGE, WATER-SUPPLY AND OTHER WORKS.*

ALTHOUGH the comparatively uninteresting subject of drainage may be considered necessarily somewhat commonplace, I venture to think that no apology should be necessary at a meeting of the Royal Institute of British Architects when such a matter is brought forward for consideration. I cannot forget, however, that some enthusiasts prominently associated with our profession have asserted in the plainest possible terms that an architect, if he be strictly an artist, has far too much to think about in evolving the conceptions of his art to trouble himself about drains. This opinion may be traversed without parley, and indeed I venture to assert that no architect, whatever may be his artistic capabilities, can afford to neglect so important a part of his work, however much he may dislike sanitary difficulties and all that belongs to them. Mr. Norman Shaw's admirable dictum, that "a true architect is far more likely to be a practical man than a practical man is likely to be an architect,"† is doubtless true, and few would probably dispute the further self-evident truism that, unless a building be structurally satisfactory and properly drained, its abstract merits as a specimen of fine proportion and beauty of design can but afford a very qualified enjoyment to those whose fate it is to use it. A little care and forethought at the outset of a building undertaking would often enough have saved countless troubles and ultimate expense. Those

who neglect so practical a side of their business go far in practice to justify the existence of a standing army of so-called specialists, whose business it is to make themselves ready to supply the assumed deficiencies of the architect. These things ought not so to be, and surely in this matter of drainage there is, after all, nothing so very difficult, so very special, that the architect should give way to the drain doctor, whose costly contrivances often turn our buildings into veritable museums of building appliances, and disfigure our skylines in every direction. These worthies, on the other hand, have no doubt had the excuse not infrequently ready made to their hand, because architects, in scheming the plans of their buildings, have paid so little regard to the position of water-closets, baths and sinks, which are located here, there and everywhere, thus rendering a really simple system of drainage almost an impossibility.

The less complicated the sanitary arrangements of a building are, of course, the better, and a few well-known rules will go a long way to simplify the planning of drains of even the most intricate buildings. Thousands of existing structures of all kinds will have to be redrained during the next few years, and much of such work will be far better done by qualified architects than by any other class of men. Specially is this the case where the buildings have any just claim to be considered as specimens of architectural merit, while with historic buildings such as the one with which we have to treat to-night, it seems to me of the utmost importance that none but an architect should be allowed to touch the fabric, and even the extent of his work should be rigidly limited to the simple repair and renovation of their perished or perishing parts, while his sanitary work should be carried out in the quickest and most unobtrusive manner possible. Moreover, in dealing with the sanitation of old buildings it is inevitable that much of the work necessary for the efficient execution of the undertaking will partake of the nature of architectural restoration. The condition of the fabric as a whole must be considered, and herein the value of an architect's judgment is of prime importance. Damp walls and unhealthy rooms may arise from a variety of causes not immediately connected with those things with which the drainage-specialist usually concerns himself, and, as a matter of fact, the most elaborate reports from such sources have been prepared dealing with the unsanitary conditions of buildings and in devising costly schemes for their improvement, without even mentioning some of the most evident causes of mischief which a properly qualified architect would point out almost at a glance. While, therefore, I desire to insist upon the unquestionable necessity of thoroughly good drainage, I would urge that the drains after all are only a part, and sometimes really a small part, of what should form a well-considered whole in the efficient work of building, whether we are dealing with a new building or an old one.

Blickling Hall, erected in 1620, is one of the largest and most beautiful mansions in East Anglia. It is situated in a magnificent park, and occupies the site of a palace once belonging to the Bishops of Norwich. Its position, like many another house of its time, is low, and consequently its effective drainage presented difficulties of no small order. These had been increased by alterations in the basement, where its level was lowered some time ago. The moat which surrounds the house has been planted as a garden for very many years, but under the moat itself an old brick culvert extends on all four sides of the building, and this culvert was used as the sewer for all purposes. Its outfall extended for about three-quarters of a mile alongside of the lake, which is about eighteen acres in extent, to its lower end, and there this drain terminates in a copse, through which the overflow of the lake water is carried by way of a stream which continues through the property for miles.

The first portion or upper end of this outfall drain from the culvert round the house had no fall at all, and stood charged with water approximately level with the lower parts of the basement floor. This superabundance of water was principally due to the fact that the culvert passes under the bed of the lake, thus immediately connecting it with the foundations of the hall, while the whole of the roof and surface water collected from the forecourt, stables and adjacent farm buildings, as also from the kitchen wing in front of the mansion, was brought down to the low level of this old brick drain below the moat on its way to the main outfall above described. The culvert, being in itself of faulty construction, was quite unable to withstand such a pressure of water, and in consequence the entire basement was saturated with sewage water, continually causing damp. The supply of flowing water always coming through the drain under the roadway next the kitchen wing from the stream in the fields to feed the lake, had for a long time been needlessly charging the old flat low level sewer, and helping to augment the soakage of the basement already alluded to. Beyond this all the soil from the w.c.'s and sink water had polluted the body of water, while the catch-pits near the house retained a considerable quantity of foul deposit which greatly increased the evil, added to which a stagnant

* Abstract of paper read at the Royal Institute of British Architects, January 8, 1894, by Mr. Maurice B. Adams, F.R.I.B.A.

† *Architecture: a Profession or an Art?* p. 11.

cesspool existed about half-way between the house and the lake. This surcharge of water effectually prevented the bulk of the sewage from reaching the outfall beyond. The basement was so inundated that boards or permanent wood lattice-ways had to be provided in places along the passages to allow the servants to pass over the water. The walls were green with damp, as were the lower steps of the stone staircases, and the woodwork to the windows and skirtings was rotting with wet, producing a state of things most injurious to health. Nothing could very well have been worse under the circumstances, seeing that all the sewage from the stables and kitchen wing was brought from the comparatively high level in front of the mansion down into the basement.

Before briefly describing the new scheme of drainage which I carried out, it may be interesting to mention a curious circumstance connected with the water-clogged condition of this site. An old cesspool was found under the middle of the private drawing-room in a position which at no time since the present mansion has existed could either have been necessary or even convenient—in fact, no use so far as can be seen could have been found for it in such a position. This cesspool therefore must have belonged to the earlier house of Tudor times, for the existing building was erected about 1620. When opened, this cesspool was just as if it had only been in recent use, a state of things which, so far as I know, can only be accounted for by the quantity of water in the land permitting neither the soil to soak out of the cesspit, nor soaking itself into it to dilute the contents, which, by these means were, to all intents and purposes, hermetically sealed, preserved really to develop nineteenth-century nuisances, another evidence of the truth of the well-known saying, "The evil that men do lives after them." I have thus pointed out, I think sufficiently, the main difficulties which presented themselves when I was called upon to solve the problem as to how best to deal with the unsanitary condition of Blickling Hall, and, as a matter of fact, in doing this I really had only a few inches of differences of level in some parts to avail myself of. Permit me now briefly to describe the principal features of the scheme which I carried out.

My first point was to intercept the drainage coming from the two main wings and other buildings in front of the mansion, and so prevent a vast quantity of sewage and surface water from discharging into the lower level round the house at all. This I did by taking an iron drain through the kitchen-staircase hall, and having an ample fall for the purpose I diverted this higher ground drain away from the house in a westerly direction through the park, till it joined the new manhole beyond the sewage sump, which I shall mention presently. Superabundance of water, as you have seen, was the chief cause of the troubles which had to be removed, and I determined to convert its main source into a useful friend, instead of allowing it to remain a serious enemy, as it had undoubtedly hitherto been. I refer to the stream water which came past the kitchens and through the west gardens to feed the lake. This water clearly furnished an available power at once to hand for pumping the low-lying drainage. I therefore cut off the old, rotten and leaking brick culvert, by which this water was conveyed to the lake. I formed a weir of 21-inch glazed ware mastic-jointed pipes, and by carrying it back a considerable way up the roadway course of the stream by the kitchen wing an ample head of water, even in the driest weather, was obtained to work an overshot wheel capable of working two pumps. These were designed and made by Messrs. Easton & Anderson. All the old drains in and about the mansion were taken up, as they proved to be deficient either in fall or in condition, and, moreover, were all difficult of access. All the new drains were laid in straight lengths, and every branch was brought into inspection-pits or manholes, so as to be readily accessible and easily cleared. The manholes were trapped and ventilated, and all the house drains were effectively isolated from the main sewer. The old culvert round the hall was cleaned out and reserved exclusively for rain and surface water, the soil-drains system being kept entirely distinct. The sewage from the house thus collected into one outfall was conveyed to a large sump situated beyond the fosse on the west side of the mansion, and from this tank it is pumped into a 12-inch new pipe drain, which extends from this point about 550 feet in a westerly direction across the park at a higher level, and discharges by its own gradient into the old culvert beyond the point where it passes under the bed of the lake, and from whence it possesses a fall. This is about 800 feet away from the house. At this point I inserted a tidal ball-valve, to prevent any back flow of sewage towards the Hall. The rain and surface water about the house collected in the old culvert under the moat was brought also into the sump, which was estimated to be equal to two days' discharge should both pumps fail at any time.

The stream water waste after passing the wheel flows into the lake, which it supplies as before. The sump is ventilated by a shaft up an adjoining tree, and the pump-house is sufficiently far away from the Hall to prevent the click of the machinery from being heard. An automatic flushing-cistern

fitted with an Adams's patent syphon is fed from the stream weir, and flushes the new main soil-drain periodically, leading to the sump. The difficulty of constructing the sump was considerable, in consequence of the vast quantity of water in the land, and continuous pumping night and day had to be employed. The ground had to be kept up by close sheet-piling, which also served to assist in keeping out the water. An inverted arch of blocks of concrete, made on the spot, formed our foundations, and on this we built up the sump, the big manual pump being placed in the centre. When the time came for removing this pump I had a plug of elm driven into the aperture, a hole sufficiently large to take a small pump being first made in this plug. A small pump was then inserted to relieve the water pressure while the bottom was made good round the larger opening. When this had been done the small pump was drawn out and a timber pin was driven into the hole. The result was most disastrous, for the water burst up the brickwork round about the bigger timber, and all efforts to make it good were unavailing. The water rushed up into the sump as if it rose from a boiling spring, so that the tank was soon full. I went down to Blickling on this occasion with feelings of much misgiving, for it seemed as if the water which I had set myself to master would prove too much for me. However, to sum up, I managed it this way. I stopped the hand-pump and let the water rise to its normal level. I then threw in several bags of Portland cement till the water was saturated with it, and next had some Portland cement concrete let down in buckets and tipped so as to form a raised centre or hill in the centre of the invert bottom over the timber plug. This concrete was rammed carefully so as not to unnecessarily disturb the water, and was thus left to set under water. In ten days or a fortnight we pumped this water out of the sump, and beyond a few tricklings here and there through the joints of the walls of the tank, no water whatever came in, the boiling up from the sump's bottom was stopped, and we became masters of the situation.

Mr. Adams next described the alterations to the outer and inner courts of the mansion, and gave particulars of the rearrangements inside the house, with dry areas and other new work. The whole of the east roofs were renewed, the clock tower restored, and old timber and cement windows along the north part were taken out and replaced with stone. The new fire service system, with the tower which Mr. Adams built in the park, the turbine and the well, bored about a mile from the house, were also enumerated in detail. Several views and plans showing the work as executed were exhibited, together with some photographs.

BOOK AND NEWSPAPER ILLUSTRATION.*

LAST week we saw on the screen a number of enlargements of drawings which had been reproduced successfully by the common relief processes, suitable for the type-press. The most interesting and suggestive to students were those drawn by painters, each adopting his own method of expressing in black-and-white line the effect and spirit of his picture. The result in most cases showed a freedom of handling and an unconventional treatment of line drawing to give tones and values, in striking contrast to the majority of process work. Some of these were only sketches and on various kinds of paper or board, but the artists knew what they wanted to express and took the readiest and simplest method to attain it. They had dwelt for months on their subject, they knew the picture by heart, as the saying is, hence the value to us of their suggestive lines. These drawings (examined with the results when reproduced) form together, I believe, the soundest teaching in black-and-white work.

Drawings thus made upon Bristol board or paper of that surface with black ink, Indian ink, or any of the numerous inks now in use which dries with a dull, not shiny, surface, will always reproduce well. The pen should be of medium point, or a brush may be used as a pen. The lines should be clean and sharp, and are capable of much variation in style and treatment, as we saw in the various examples last week. I purposely do not dwell here upon some special surfaces and papers by which extraordinary effects may be produced sometimes by the line processes; there is too much tendency already with the artist to be interested in the mechanical side.

To turn the drawing before you into a suitable block, the first process is to photograph it to the size required (say 5 by 4) and transfer the negative on to a sensitised zinc plate. This print or photographic image of the drawing lying upon the zinc plate is of greasy substance (bichromate of potash and gelatine), and is afterwards inked up with a roller; the plate is then immersed in a bath of nitric acid and ether, which cuts away what were the white parts on the paper, leaving the lines

* From the Cantor lectures, by Mr. Henry Blackburn, delivered at the Society of Arts in December.

of the drawing in relief. This "biting in," as it is called, requires considerable experience, according to the nature of the drawing. Thus the lines are turned into metal in a few hours, and the plate when mounted on wood to the height of type-letters, is ready to be printed from, if necessary, at the rate of several thousands an hour.

The best drawing for process reproduction is one that requires little or no touching on the part of the engraver or maker of the blocks, but it is difficult to impress on the artistic mind the necessity of conforming to certain rules. Some cannot draw firm clean lines at all, and should not attempt them. Few allow sufficiently for the result of reduction and the necessary thickening of some lines. The results are often a matter of touch and temperament. Some artists are naturally unfitted for line work; the rules which would apply to one are almost useless to another. Again, there is a great inequality in the making of these cheap zinc blocks, however well the drawings may be made; they require more care and experience in developing than is generally supposed.

Let us look now at the enlargement of a line drawing which is more difficult to reproduce; a portrait by the late Frank Holl, R.A. (drawn on Whatman paper, $4\frac{1}{2}$ inches by $3\frac{1}{2}$ inches), in which there are many pale, uncertain and complicated lines which could not be produced well by the process just described. Here a more delicate and sensitive method is necessary to obtain a relief block. It is called the "gelatine process," or the "Gillot process."

The drawing is photographed to the required size (as before), and the negative laid upon a glass plate (previously coated with a mixture of gelatine and bichromate of potash). The part of this thin, sensitive film, exposed to the light, is absorbent, and when immersed in water swells up. The part protected from the light by the lines of the drawing remains near the surface of the glass. Thus you have a negative from which a metal cast can be taken, leaving the lines in relief as in the zinc process. In skilful hands this process admits of more delicate gradations, and the pale, uncertain lines in the drawing before us can be reproduced with tolerable fidelity. The blocks take longer to make, and are double the price—roughly, 1s. per square inch—of the first process described. There is no process yet invented which gives better results from a pen-and-ink drawing for the type-press. These blocks when completed have a copper surface. The reproductions of pencil, chalk or charcoal drawings by the above processes are nearly always failures, as we may see in the best artistic books and magazines to-day. I will refer to them presently.

For those who cannot draw easily with the pen, there are several kinds of grained papers which render drawings suitable for reproduction. The first is a paper with black lines imprinted upon it on a material suitable for scraping out to get lights and strengthening to get solid blacks. The drawings thus made can be reproduced in relief like line drawings, taking care not to reduce the black grain much or it becomes "spotty." Another paper largely used has a white grain, a specimen of which I will show you presently on the screen; and there are other variations of grained papers on which we will not dwell.

Here the question may arise in many minds, Are these contrivances with their mechanical lines for producing effect, worthy of the time and attention which has been bestowed upon them? I think it very doubtful if much work ought to be produced by these means; and certainly in the hands of the unskilled the results would prove disastrous. A painter may use them for sketches.

The increased use of mechanical dots to give shadow and colour to a pure line drawing is always to be regretted, whether it be applied to a necessarily hasty newspaper sketch, or to one of Vierge's handsomely printed illustrations for the "Pablo di Segovia." One cannot condemn too strongly this system, so freely used in continental illustrated sheets, which, in the most skilful hands, seems a degradation of the art of illustration. These dots and lines, used for shadow or tone, are laid upon the plate by the maker of the block, the artist indicating, by a blue pencil mark, the parts of a drawing to be so manipulated; and as the illustrator has not seen the effect on his own line drawing, the results are often a surprise to every one concerned. I wish these ingenious contrivances were more worthy of an artist's attention. Nothing but the speed with which a sketch for a newspaper can be thus made seems to excuse its use. Hurry is the secret and the mischief of it all.

Here is an example taken from an English print, by which you see that all daylight has been taken ruthlessly from an open-air sketch. The system is tempting to the hurried illustrator; he has only to draw in line (or outline, which is worse), and then mark where the tint is to appear, and the dots are laid on the zinc plate by the maker of the blocks.

The question is again uppermost in the mind, Are such mechanical appliances ("dodges," I venture to call them) worthy the serious attention of artists, and can any good arise

in imparting such knowledge to youthful illustrators in technical schools? Wood-engraving was a craft to be learned, with a career for the apprentice. There is no similar career for a lad by learning the "processes" at technical schools, and nothing but disappointment before him if he learns the mechanism before he is an educated and qualified artist.

It should be mentioned that all wood or steel engravings reproduce easily by the common zinc line process, but the reproductions are apt to lose brightness, and if much reduced break up or become spotty. Mention should be made also of drawing on prepared transfer paper with autographic ink, which is transferred to zinc without the aid of photography—a process very useful for rapid and common work; but it is irksome to the artist, and not capable of very good results; moreover, the drawing has often to be minute, as the reproduction has to be the same size as the original.

I now come to the method of reproducing wash drawings and photographs, on blocks suitable for printing at the type-press, commonly known as the "half-tone process," a most ingenious and valuable invention, which in clever hands is capable of artistic results, but which in common use has cast a gloom over our illustrations in books and newspapers.

Now, to make these blocks. As there are no lines or whites in a painting or from a photograph from nature, it is necessary to obtain some kind of grain or interstices of white on the zinc plate, as in a mezzotint. So between the drawing or photographic print to be reproduced and the camera, glass screens, covered with lines or dots, are interposed, varying in strength according to the light and shade required, thus turning the image of the wash drawing practically into "line," with sufficient interstices of white for printing purposes.

Thus, all drawings in wash, chalk, pencil, &c., that will not reproduce by the direct line processes already referred to are treated for printing at the type-press, and thus the uniform, monotonous dulness with which we are all familiar pervades the page.

The artist who draws in wash with body colour, or paints in oils in monochrome, for this process will see at once that his high lights will be lost and his strongest effects neutralised under this effect of gauze; in short, that there is no longer any breadth of white or black in his picture; and so, for pictorial purposes, the illustrator who draws in wash has to force his effect and exaggerate his lights and shades, avoiding too delicate gradation, and in his different tints keeping, so to speak, to one octave instead of two. Thus also for this process, to obtain brightness and cheap effect, the illustrator of to-day often avoids backgrounds altogether.

Some excellent results may be obtained by experienced and practised draughtsmen if their work is well reproduced with a fine grain and printed carefully on good paper. But where the block has to be prepared for printing—say 5,000 an hour off rotary machines—a coarser grain has to be used, producing the "Berlin wool pattern" effect you see before you.

There are many ways by which drawings unsuitable for the relief-toned processes are made available. Great advances have been made in the "screening" of pencil drawings, where a great deal of white has to be left. If, in the endeavour to get the best results out of a few tones by the mechanical process, work lacks some artistic qualities, it is almost a necessity; but the tendency of this most modern form of illustration is to think too much of technique. But with the utmost care and patience on the part of the artist, wash drawings, rendered by the half-tone process, are uncertain and artistically incomplete. It is more suitable for the rendering of sketches. Of the illustrators who use this process in a more free and easy way we will now take an example.

Here truths of light and shade are disregarded, figures stand out in unnatural blackness against white paper, and flat, mechanical shadows are cast upon nothing. Only sheer ability on the part of a few modern illustrators has saved these coarse, ungainly sketches from universal condemnation. But the splashes and spots and stains which are taking the place of more serious work in illustration has become a vogue in 1893. The sketch is made in two or three hours instead of a week; the process is much cheaper than wood-engraving. The public is satisfied with a sketch where formerly a finished illustration was required, if the subject be treated dramatically and in a lively manner. If it comes out an unsightly smear on the page, it answers the purpose of topical illustration, and apparently suits the times. It is scarcely too much to say that this example would not have been tolerated a few years ago. But it is the taste of the times to which the modern illustrator has adapted himself; and it is little short of a revolution in illustration, of which we do not yet see the end. One thing we must continuously bear in mind, that these hastily produced blotches called illustrations, which disfigure the pages of so many books and magazines, are the result of want of care on the part of the artist rather than of the maker of the blocks. The latter are, according to my experience, the most patient and painstaking of operatives.

The result of all this—a very serious one to the artist as far

as we can see ahead—is the gradual substitution of photographs from life for any other form of illustrations.

Now let us see what becomes of a very artistic photograph when put through the half-tone process. Here is the photographic print from a painting by M. Jules Lefebvre. This excellent silver print, full of delicate gradations and strong effects, appears on the plate through the film of gauze, dull, flat and comparatively uninteresting; but the expression of the original is given with more fidelity than could be done by any ordinary wood-engraving. To touch this on the negative and bring out the lights and accents of the picture is the common thing to do by the makers of the blocks; but it is a hazardous process at the best, when dealing with the copy of a painting. I mention it to show where hand-work in the half-tone process first comes in. The block, when made, is also often touched up by an engraver in places, especially where spotty or too dark; on this work many who were formerly wood-engravers now find employment.

But the ideal illustration by process, whether from a line drawing, wash or photograph, it cannot be repeated too often, is the one which requires the least manipulating on the part of the maker of the block, who has seldom or never the opportunity to attend to it properly. In the case of the reproduction of photographs especially, which we are now considering, much may be done by working up a platinotype print before giving it out to be made into a block. Much depends here upon the artistic knowledge of editors and publishers, who have it in their power to produce good or bad illustrations from the same original. The makers of these blocks being confined to time and price are practically powerless.

To turn to other subjects where the photographer is the illustrator. The photographer goes down a mine with his apparatus, and takes a series of views of the workings, which could probably have been done by no other means. Under most difficult circumstances he sets his camera, and by the aid of the magnesium flash-light gives us groups of figures at work amidst gloomy surroundings. Whether these are not both artistic and valuable as illustrations I leave you to judge.

We may observe that it is not the artist and the wood-engraver who are "working hand-in-hand" in the production of the great majority of illustrations, as in America, but the photographer and the maker of process blocks. This is significant. Happily for us there is much that the photographer cannot do pictorially. But the photographer is, as I said, marching on and on, and the line of demarcation between original and photographic illustrations is less marked than formerly.

The photographer's daughter goes to an art school, and her influence is shown clearly in the exhibitions of the photographic societies. This influence and this movement is so strong—and vital to the artist—that I feel it cannot be emphasised too much. The photographer is ever in our midst, correcting our drawing with facts and details which no human eye can see and no one mind can take in at once.

Of the obligations of artists to photographers a book might be written. The benefits are not, as a rule, unacknowledged, nor are the bad influences of photography always noticed. That is to say that, before the days of photography, the artist made himself acquainted with many things necessary to his art, for which he now depends upon the photographic lens; in short, he uses his powers of observation less than he did a few years ago. That the photographer leads him astray sometimes is another matter.

Whatever developments may await the art of photography, says Mr. William Small in 1893, "it will never take good work out of a good artist's hands." In line work (the best and surest for the processes) photography can only be the servant of the artist, not the competitor; and in this direction there is much employment to be looked for. But in whatever material or style, newspaper illustrations, to hold their own, must be of the best. Let them be as slight as you please, if they be original and good. At present we are casting off—ungratefully, it would seem—the experience of the lifetime of the wood engraver, and are setting in its place an art half developed, half studied, full of crudities and discords. The illustrations which succeed in books and newspapers succeed, for the most part, from sheer ability on the part of the artist; they are full of ability, but, as a rule, are bad examples for students to copy. "Time is money" with these brilliant executants; they have no time to study the value of a line nor the requirements of the processes, and so a number of drawings are handed to the photo-engravers—which are often quite unfitted for mechanical reproduction—to be produced literally in a few hours. It is an age of vivacity, daring originality and reckless achievement in illustration. "Take it up, look at it and throw it down," is the order of the day. But there is no reason but laziness why the work done "to look at" should not be as good as the artist can afford to make it. The manufacturer of paperhangings or printed cottons will often print only a limited quantity of one design, no matter how beautiful, and then go on to another. So much the better for the designer; but he would not keep

employment if he did not do his best, no matter whether his work is to last for a day or for a year. The life of a single number of an illustrated newspaper is a week and of an illustrated book about a year.

Another influence on modern illustrations, for good or bad, is the electric light. It enables the photographic operator to be independent of dark and foggy days and to put a search light upon objects which otherwise could not be utilised. So far good. To the illustrator this aid is often a doubtful advantage. The late Charles Keene (with whom I have had many conversations on this subject) predicted a general deterioration in the quality of illustrations from what he called "unnatural and impossible effects," and he made one or two illustrations in *Punch* of figures seen under the then—ten or fifteen years ago—novel conditions of electric street lighting, one of which I will show you on the screen. Charles Keene's predictions have come true; we now see the glare of the magnesium light on many a page, and the unthinking public is dazzled every week in the illustrated sheets with these "unnatural and impossible effects." Thus it has come about that what was looked upon by Charles Keene as garish, exaggerated and untrue in effect, is accepted to-day by the majority of people as a lively and legitimate method of illustration.

I must mention one more influence on the young illustrator. The "process man," the teacher and inciter to achievements by this or that process, is not usually an "artist" in the true sense of the word. He knows better than anyone else what lines he can reproduce, and especially what kind of drawing is best adapted for his own process. He will probably tell the young draughtsman best what materials to use, what amount of reduction his drawings will bear, and other things of a purely technical, not to say business-like character. Let me not be understood to disparage the work of photo-engravers and others engaged on these processes; on the contrary, the amount of patience, industry, activity and anxious care bestowed upon the reproduction of drawings at the present time is astonishing, and deserves our gratitude. Their work in England is a new industry of an important kind, in which art and craft are bound up together. The photo-engravers are our faithful friends and are ready to serve us well, if only the public (represented by editors and publishers) will recognise that good work requires good pay. The day has passed when "process work" is to be looked down upon as only fit for the cheapest, most inferior and inartistic results.

There is no doubt that the makers of process blocks are the best instructors as to the results to be obtained by certain lines and combinations of lines; but in the majority of cases they will tell the artist too much and lead him to take too much interest in the mechanical side of the business. His best protection against this tendency, his whole armour and coat of mail, is to be an artist first and an illustrator afterwards.

This is the sum of the matter. Perhaps some of the examples I have brought here to-night may help us and lead to a more thorough testing of results by capable men.

THE LATE MR. CLARK STANTON, R.S.A.

MANY will hear, the *Scotsman* says, with deep regret of the death of this member of the Royal Scottish Academy, which took place on Monday at his residence, 8 Hermitage Terrace. Of late years Mr. Clark Stanton aged rapidly. His physical powers have been gradually failing. Those who saw him at the recent exhibition of the Scottish Artists' Society were greatly shocked at his altered appearance. He looked seventy, though he was only sixty-two, and in these last days, when confined to bed, life simply ebbed peacefully away. Born in 1832 in Birmingham, Mr. Clark Stanton received his early education at the King Edward Grammar Schools of that city. Art he studied in the Birmingham School of Art. His father, who was in business, wished him to adopt a commercial calling, but Mr. Stanton's tastes being entirely opposed to this course he was allowed to have his own way, all the more as in his youth he was not of robust health. Sketching and modelling were the things in which he delighted; and while still a young man he became associated with the great Elkington firm as a designer and modeller. Many of his figure designs were reproduced by this house in silver and bronze, and he had the honour of designing a silver table which the Prince Consort presented to Her Majesty. So highly was the young artist thought of by the firm that they sent him to Florence to still further continue his studies and to pick up ideas from the wealth of artistic material with which that Italian city abounds. One of his commissions was to model a statue, and this he did, the work called the *Ivy Wreath*—a study of the nude—being exhibited by him in the Royal Scottish Society's exhibition in 1857—the first year his name appears in the R.S.A. catalogue. The statue was described in the *Scotsman* of that day as being modelled in a "masterly and effective" way. When in Florence he became acquainted with

Mr. and Mrs. Gamgee and their family, and came with them to Scotland about 1855 and settled in Edinburgh. In 1861 Miss Gamgee became his wife. In his earlier years in Edinburgh Mr. Stanton did a good deal of designing for such publishers as the Messrs. Nelson, Messrs. Nimmo and Messrs. Ballantyne; and all through life it may be generally mentioned that he did excellent work in designing and modelling cups, groups of animals, and designs for plate for Edinburgh and other silversmiths. It was in 1857, as stated, that he first exhibited at the Royal Scottish Academy. Besides the *Ivy Wreath*, he showed that year a series of medallion portraits, among others of Professor Laycock and Mrs. John Gamgee, which were much admired, as also a fine bust of the late Professor Dick, which, afterwards carved in marble, now adorns the Dick Veterinary College. In the same year he likewise exhibited a series of bas-reliefs illustrating *The Seven Ages of Man*. In 1861 he had in the Scottish Academy a dainty figure in bronze, called *The Young Reveller*, which was a commission from the late Mr. Robert Horn, advocate; and in 1862 he had a bust of Garibaldi, for which he had received sittings from that Italian patriot during the time the artist was in Italy. It is still in the artist's studio. He also showed a statuette of Guinevere in 1862, which was the year he was elected an associate of the Academy. In 1864 he exhibited the cast of the Caledonian Challenge Shield, a trophy which has constituted for the last thirty years the chief prize at the Edinburgh Rifle Meeting. The shield, as all volunteers know, is a spirited and beautiful piece of work, and did the artist much credit.

Among other works by Mr. Clark Stanton may be mentioned the group of three figures, the soldier, sailor and artisan, at the base of the Prince Consort's memorial in Charlotte Square; several of the figures, including Friar Tuck, on the Scott Monument, and part of the relief work on the pedestal of the Duke of Buccleuch's monument in Parliament Square. One of the more important of his sculptured figures shown at the Royal Scottish Academy was his *Pandora*, in 1883, which had also a series of bas-reliefs round the pedestal. In 1885 he exhibited a panel in which, in bas-relief, he gave poetical expression to the line—

When loved ones departed return in our dream.

Mr. Clark Stanton had to wait until 1883 for full membership of the Academy. His was a quiet, sensitive nature, and possibly his retiring disposition had not brought him many friends. But in the meantime it may be feared the high hopes of his more youthful years had gradually slipped away; the sculptor's art has never received great patronage in Scotland, and the golden opportunity for distinguishing himself never exactly arrived. Many of the works he executed did not find purchasers, and what wonder if his courage sometimes failed him, and if to all but his most intimate friends he lived very much apart? But those who knew Mr. Clark Stanton never spoke of him otherwise than as the gentlest and best of men. He had a fine artistic taste, a neat and dexterous hand. He was a skilful modeller, especially in relief, and his work rarely wanted a touch of that graceful decorative feeling conspicuous in Classical art. Possibly its one fault was that it sometimes wanted "grit"—a quality that was also rather lacking, perhaps, in his own composition. In 1881, while an Associate, he was elected Curator of the Life School—an office which involved a good deal of administrative drudgery, which, however, he cheerfully performed. But it had at least one compensation, inasmuch as it brought him into personal and friendly relations with the Academy students, who one and all cherished for him the very highest regard. For a good many years Mr. Clark Stanton exhibited both oil and water-colour pictures, as well as sculpture. Many of his water-colours were exceedingly good—a bit old-fashioned, perhaps, in subject and style, but alike in draughtsmanship and colour works of a pleasing character. Mr. Clark Stanton is survived by a widow and a grown-up family.



Double Windows versus Cold.

SIR,—The thinness of the walls of our houses, as well as most private and public buildings being provided only with single windows, are doubtless among the chief reasons conducing to the freezing up of so many water-pipes and their bursting subsequent to the thaw.

In my Brighton residence, some 120 feet above the level of the sea, which it faces in a south-westerly direction, I find the foreign plan of having double windows has many advantages.

1. In winter, by keeping in the heat of the room and excluding cold, double windows diminish the quantity of coal necessary for heating one's rooms.

2. During fierce storms double windows completely exclude wet and wind.

3. Double windows greatly deaden the noise attending storms, and frequently prevent one's hearing the cries of itinerant hawkers, as well as the belligerent discord of street music.

4. Double windows seem often to enable one to put up with the discomfort of having no convenient means of heating, by open fireplaces, hot air or hot-water pipes, the staircase of one's house, which, of course, in winter ought to be warmer than the living and sleeping rooms.

5. During cold weather on both sides of the panes of single windows ice is often deposited. Hence in a room which is well warmed, when striking against this cold surface the heated air is radiated or reflected back into the room in the shape of a sharp cold draught, which may be injurious to the health of delicate people, especially if seated near the window. However, in the case of double windows, these draughts by radiation are scarcely perceptible, because in a heated room the internal window is warm, particularly if there is a broad air space separating the outer from the inner window.

The back of my house being directly exposed to northerly and north-easterly gales has enabled me often to observe a difference of from 15 deg. to 20 deg. Fahr. between the temperature recorded in the inner side of the external window, as compared with the temperature on the room side of the internal window.

When I first lived in my present residence, during the winter in passing from the front to the back of the house there was frequently a difference of 15 or more degrees Fahr.; so that thus one felt as if one were almost entering another climate.

However, subsequently, being protected by double windows and double skylights throughout the house, as measured from within it, there has been during winter only a very slight difference between its two aspects. Even draining all the cold-water pipes at night time in this house, furnished with a constant water-supply, which has practically no cold-water cisterns (except small ones for the lavatories), nevertheless during sharp frosts some of the cold-water pipes froze up.

I presume this experience proves that even double windows will not prevent the freezing of one's cold-water pipes in houses where the walls are too thin, as is unfortunately too often the case in our modern jerry-built British houses, usually architectural and artistic abominations.

As so many British workmen are now seeking employment, the general introduction of double windows to the backs and fronts of houses would give a large amount of work to many skilled carpenters, glaziers, builders, &c.

The Building and Improvement Act of the future should insert a clause compelling all new houses and buildings to be erected to be provided with double windows, as customary in most foreign countries having cold winters.—I am, sir, yours, &c.

J. LAWRENCE-HAMILTON, M.R.C.S.

30 Sussex Square, Brighton: January 1894.

GENERAL.

Mr. Thomas Drew, R.E.A., was on Tuesday elected president of the Royal Society of Antiquaries of Ireland.

Professor W. Friedrich is now exhibiting in Munich eighty water-colour drawings representing scenes in India which were witnessed during a seven months' tour.

The Spring Exhibition in the Leeds Fine Art Gallery will be opened on February 19. The offers of pictures, owing to the depressed condition of the market, are more numerous than in preceding years. The galleries are about to be repaired.

Professor Forchhammer, the archaeologist, has expired at Kiel. He devoted his life mainly to the elucidation of Classic archaeology. In one of his works he explained the relation between architectural styles and climatic conditions.

Mr. W. Frank Calderon proposes to open a school of animal painting in April next if sufficient pupils are obtainable. Messrs. Briton Riviere, Davis, Gow and Heywood Hardy have promised to visit the classes periodically.

The Council of the Royal Society of Painter-Etchers have elected the following as Associates of the Society:—F. Boberg, G. W. Eve, A. Hartley, Prof. Le Gros, H. Macbeth-Raeburn, H. G. Massey, W. Monk, C. M. Pott, and E. Stamp.

The Rev. E. S. Mylne read a paper on Wednesday, entitled "The Influence of the Mylnes on the Architecture of Edinburgh," at the meeting of the Edinburgh Architectural Association.

Mr. G. D. Leslie, R.A., has designed a handsome altar-table for St. Leonard's Church, Wallingford, of which he is vicar's warden. All the painting has been undertaken by Mr. Leslie.

Mr. J. H. Phillips, of Cardiff, has been successful in the competition for the Llandoverly Girls' Intermediate School. Mr. Ewan Christian was the assessor.

The Architect.

THE WEEK.

CÉSAR DALY who was buried on Sunday was a typical Celt. He was the son of an officer in the English army who was imprisoned under NAPOLEON, and could not, therefore, claim to belong, like the late Marshal MACMAHON and many others, to that Irish Brigade which, since the days of LOUIS XIV., has constituted a sort of nobility in France. In no way was he an aristocrat, but he possessed so many of the qualities of Frenchmen he might be supposed to come of a family that had been established in France from time immemorial. He was endowed especially with that gift of speech which in the days of the Romans was a characteristic of the race, and he was never more happy than when exercising it. A born tribune, whose fitting work should be in the chamber, the law courts, or the pulpit, by one of those freaks of Fate which can mar great gifts he was diverted from his natural course and converted into an architect. He manfully endeavoured to carry out his work and his fervid imagination enabled him to regard the art as a sublime thing. He studied those examples of it in the East and West which were surrounded with mystery. The bourgeoisie, who are the chief patrons of the art, could not appreciate so exalted a way of treating business, and CÉSAR DALY in consequence was not enriched by commissions. Another cause operated against him. His eloquence naturally made him seek opportunities to move his fellows, and he took part in the social experiments of theorists like PÈRE ENFANTIN and FOURIER. Their phalansteries might be excellent institutions, but they never got beyond the paper stage, and association with them was not beneficial to CÉSAR DALY. When the French Revolution of 1848 broke out he thought the good time had dawned. He dreamed of elevating the people by means of art, which was to become inseparable from industrialism. He also endeavoured to obtain for art and literature a special representative in the Assembly, but LOUIS NAPOLEON appeared on the scene, and the artists and poets were the first to hail him as the saviour of France. CÉSAR DALY was obliged to refrain from the exercise of his eloquence on political subjects. He wrote books and established various journals. Everybody was ready to admit that he was a man of genius, who was capable of accomplishing great deeds, but his countrymen preferred to withhold the opportunities from him. He was an able writer, and yet his books and articles never attained the success which was awarded to those by men of inferior ability.

EDINBURGH is visited by so many strangers it is surprising the citizens have not adopted some means to enable the historic houses to be identified. The deficiency is about to be remedied. An anonymous donor has offered 100*l.* to the local Pen and Pencil Club for the purpose of paying for tablets, which are to be affixed to houses where resided the literary men and artists who have helped to make Edinburgh renowned. The Club appointed a sub-committee to consider the subject. They recommend the Club to at once proceed with the work, beginning with the houses associated with BURNS, SCOTT, DAVID HUME, ADAM SMITH and Sir HENRY RAEBURN, as stipulated by the donor. A circular is to be despatched to the proprietors of the houses selected, appealing to their public spirit to grant the facilities required. The Club will offer a prize to be competed for by its members for the best design for a memorial tablet to be produced in bronze or other material for the houses selected. A tablet will therefore be erected in Baxter's Close, on the house in which BURNS resided while seeing his first Edinburgh edition through the press. Another will be affixed to 39 Castle Street, "dear 39," in which so much of SCOTT's most famous work was done, and on 25 George Square, in which he lived with his father during his boyhood and until he married. Tablets will be also placed on the High Street front of the house in Riddle's Close in which HUME began his History, and on the house at the corner of St. David Street and St. Andrew Square, which he built, and in which he died; near the site of Panmure House (North

Back of Canongate), in which ADAM SMITH lived during the years in which he was an Edinburgh citizen; and on the house 32 York Place, which RAEBURN built and used as a studio. With regard to future operations, it is suggested that the names selected should not be of those who were only temporary residents. The men should belong to either of two classes—the one represented by Lord BROUGHAM, who was born in Edinburgh, and whose whole life was affected by the influences he there received as boy and as young man; the other by men like DUGALD STEWART and JOHN WILSON, who, though not born in Edinburgh, lived as active citizens within its walls, and by their lives added to the fame of the "romantic town."

VERY few transactions can take place in Ireland without a contest. The appointment of an architect in connection with a kitchen, laundry, stores, and additional buildings of that class at a lunatic asylum would appear to be a simple affair, but it has given rise to a contest. The asylum, like so much else in Ireland, is doubly governed. There is a Board of Control and a Board of Governors. In 1887, Mr. HAGUE, who is well known in Ireland as an architect for churches and other ecclesiastical buildings, was appointed architect by the latter body. His office would not be over profitable, for the works have still to be undertaken. The Board of Control this week informed the Board of Governors that such appointments were their privilege, and they had selected Mr. J. L. ROBINSON. The latter gentleman is better known to English architects, for he has aided many an excursion by his skill as a photographer, but Mr. HAGUE is no less eligible for the work, and it is to be regretted the two architects should be pitted against one another. Some members of the Board of Governors declared they had been grossly insulted by the action of the Board of Control, but others considered the making of appointments lay with that authority. It is possible there was an overstepping of statutory powers in appointing Mr. HAGUE, but why should it need seven years to discover the error? How long the two bodies will be at loggerheads nobody can tell, and eventually we suppose either Parliament or the law courts will have to settle the difficulty.

EUGÈNE DELACROIX, the French painter, was a sort of misanthrope, who spent his days in a sweating costume in a studio that was heated like a Turkish bath—a way of living that was not advantageous for mind or body. He became more Byronic than BYRON in scorn of the world. If he can condescend to be conscious of affairs in this nether world his spirit ought to be soothed at learning that he was made the subject of a lecture by Lady COLIN CAMPBELL in Glasgow on Tuesday, being the first painter who was distinguished in so aristocratic a manner. Her ladyship said that DELACROIX was a man interesting alike for what he was and for what he represented; a man of impressive individuality and extraordinary concentration and tenacity of purpose, in whom the fires of latent energy were always at work under the mask of a subtle and polished reserve. He was the champion of the romantic movement in painting, sacrificing human affection and every other tie that he might devote himself to the one purpose of his life. So complete was he as an artist, that music and literature came to him with equal ease, and it was more than probable he would have been a great musician if he had not been a great painter. Lady CAMPBELL referred to the painter as a writer on art. In his view imagination was the chief factor in all æsthetic productions, and every work of art should bear the impress of the individuality of the artist. DELACROIX died in the year 1863, and by his instructions he was buried on the top of the hill in Père la Chaise, as if in death he desired the solitude which had marked his life. He was a combination of ice and fire such as the world had seldom seen, and his intense individuality was commemorated in the epitaph from DANTE placed over his grave—"He walked alone in undiscovered paths." A few lectures by English ladies would be not unlikely to exercise a transforming influence on French painters, and the Venus of Milo and Clichy models would be superseded by the engravings in the old "Books of Beauty."

FERGUSON'S "ANCIENT AND MÆDÆVAL ARCHITECTURE."*

IF the selection of an editor for the parts of Mr. FERGUSON'S history which relate to ancient and Mædæval architecture were left to the voting of architects, unquestionably Mr. PHENÉ SPIERS'S name would be found high up on the poll. Few men are to be found among us who have drawn and studied so many examples of buildings, or who are better qualified for giving an impartial judgment on them. As was to be expected, Mr. PHENÉ SPIERS does not turn his editing into a sort of advertising opportunity. While his influence is to be felt throughout, it is only by a troublesome comparison of editions that the extent of his work can be perceived. In his preface, Mr. PHENÉ SPIERS mentions how he "has endeavoured, to the best of his ability, to follow the course which Mr. FERGUSON himself adopted in publishing new editions, viz. to rewrite those portions which subsequent discoveries had proved to be either incorrect or doubtful." Writers, and especially those who treat of the arts, are an irritable race on earth, and their tempers may not be improved in a different part of the universe. But a good many authors in the shades would, we fancy, be ready to envy Mr. FERGUSON (should he grumble) for the pains which have been taken by his publisher to insure a further and longer term of existence for his *History of Architecture*. The five volumes are not only modernised but improved.

It is now so universally known as to need an apology for again mentioning the fact, that Mr. FERGUSON, after the manner introduced by DU FRESNOY, endeavoured to express numerically some of the qualities of the arts. He made three divisions—Technic, Æsthetic and Phonetic. To heating, ventilation, &c., 11 technic points and 1 æsthetic point were assigned. Phonetically that branch of art was valueless. At the other extremity of the scale was eloquence, with 11 phonetic points and 1 æsthetic, the technic value being 0. Architecture was placed about midway in the scale, being unique in having 4 points in each of the three divisions. It does not follow that the worth of buildings is to be taken as uniform; some have technic value in excess, others phonetic. The more perfect Gothic cathedrals have, for instance, 5 technic, 3 æsthetic and 4 phonetic. In the Parthenon there was equality. Mr. FERGUSON observes that "had any exigencies of use or economy controlled the design of the Parthenon, or of any of our Mædæval cathedrals, they must have taken a much lower place on the scale than they now occupy."

It would perhaps be impossible to assess the value of ancient buildings numerically with the impartiality of a Civil Service examiner. In some cases Mr. FERGUSON makes utility his crucial test. Sometimes he judges buildings in a way which shows that he placed picturesqueness or scenic effect above utility. His notice of Antwerp Cathedral may be taken as an instance of the kind, and will serve as well as a hundred. According to his custom, he points out where the architect has failed; or, in other words, explains what JAMES FERGUSON would have done if he lived in the fourteenth century, and were entrusted with the commission for the cathedral without any restrictions. He says:—"If the length of the nave had been divided into ten bays instead of only six, and the central aisle had been at least 10 feet wider, which space could easily have been spared from the outer one, the apparent size of the church would have been greatly increased." Granted. Let us see, however, what the change would have entailed. The outer aisles, which Mr. FERGUSON would so lightly curtail, consist of a continuous series of chapels, for it is there the side altars are arranged. Now, if the outer aisles were made narrower the number of worshippers who assisted at the services in them must be diminished in proportion. On Sundays and holidays those parts of the building often are to be seen in an overcrowded state; at an earlier time it is not likely they were deserted. Was it the duty of the architect to afford inadequate accommodation where it was most needed in order to enhance the appearance of the central aisle? The same cause determined the width of the bays. Only six altars could be placed in each

outer aisle, unless they were so close as to be sources of distraction, and accordingly there are six bays in the other aisles, which became, as it were, so many additions to the chapels. The change to ten bays if practicable would make the altars and side chapels appear insignificant. Is dignity of ritual to be always sacrificed for the sake of sightseers of Mr. FERGUSON'S class? It may be said that use or convenience and effect could easily have been combined if the Fates had imbued the architect with FERGUSONIAN principles. That artist may have been so blessed, nay, he may have been endowed with some of even higher value; but unfortunately in the fourteenth century, as in the nineteenth, compromise was the soul of architecture. The cathedral of Antwerp is an example. Space could not be more carefully economised in a warehouse. The amount of ornamentation evidently depended on circumstances. Parts look gaunt and chilling because there were no citizens to care for the adornment of them. Ecclesiastics wished for a great choir for the display of functions. The stout burghers and guilds would have places where they could show respect for their patron saints, and aisles which allowed of processions in which many men and women could take part. The architect was compelled to accept the conditions, and the wonder is that amidst the conflicts of interests he was able to evolve so much unity.

A modern architect can easily discern the limitations which hampered the designer at Antwerp; but, as the proverb says, bachelors' children are always perfect, and Mr. FERGUSON, having only to deal with buildings on paper, with imaginary clients who could, like Eastern potentates, impart their own unlimited power to their architects, and with conditions which were free from obstacles, naturally assumed that, if they cared, all architects could be omnipotent. The geometrician believes in lines without breadth and surfaces without thickness; in Mr. FERGUSON'S mind architectural practice must have been no less of an abstraction. As he knew little of the financial and other impediments to the creation of masterpieces in Europe, he assumed that architects, ancient and modern, were as free to follow their own fancies as he was when he prepared his fantastic model of an illuminated Parthenon. The East, too, may have made him more of a visionary and enthusiast than was supposed. Absurd as is the confession, we cannot resist saying that, in reading Mr. FERGUSON'S criticisms, especially those relating to modern styles, we have often imagined that he prepared himself for composition, not merely by a comparison of drawings and engravings, but by a course of the "Arabian Nights." Having to keep up a reputation for a man of business, he checks himself from presenting any vision corresponding with the Pavilion of the Caliphat, although many may have floated before him:—

Broad-based flights of marble stairs
Ran up with golden balustrade,
Right to the carved cedarn doors,
Flung inward over spangled floors.
The four-score windows all alight,
As with the quintessence of flame,
A million tapers flaring bright
From twisted silvers look'd to shame
The hollow-vaulted dark, and stream'd
Upon the mooned domes, aloof
In inmost Bagdad, till there seem'd
Hundreds of crescents on the roof
Of night new risen.

But Mr. FERGUSON writes as if he supposed that the genie who created such marvels might still be summoned, and at his command, or by the aid of some instrument, lamp, or other magic gift he is able to lend, perfect temples and palaces will arise like exhalations from the ground.

As would become a man who lived not later than "the golden prime of the good HAROUN AL RASHID," Mr. FERGUSON is not so much smitten with the buildings of Europe as with those of Asia and Africa. In his first volume he tells us with exultation how "Egypt conquered her conquerors and forced them to adopt her customs and her arts." When describing the temple of Philæ he says:—"No Gothic architect in his wildest moments ever played so freely with his lines or dimensions, and none, it must be added, ever produced anything so beautifully picturesque as this. It contains all the play of light and shade, all the variety of Gothic art, with the massiveness and grandeur of the Egyptian style." In another place he goes further, for

* *A History of Architecture in all Countries, from the Earliest Times to the Present Day.* By James Fergusson, D.C.L., F.R.S., &c. Third Edition. Vols. I., II. Edited by R. Phené Spiers, F.S.A. (John Murray.)

he insists that "neither Grecian nor Gothic architects understood more perfectly [than the Egyptian] all the gradations of art and the exact character which should be given to every form and every detail. Whether it was the plain, flat-sided pyramid, the crowded and massive hypostyle hall, the playful pavilion or the luxurious dwelling—in all these the Egyptians understood perfectly both how to make the general design express exactly what was wanted, and to make every detail and all the various materials contribute to the general effect."

The lovers of the East while under the spell of its influence can easily find other places where less reverential awe is necessary to be mingled with their admiration. "From what we know from history of the age of HAROUN AL RASHID," says Mr. FERGUSON, "it is probable that no Moorish Court ever reached a higher pitch of enlightenment and magnificence than that of Bagdad during his reign (A.D. 786-809)." Western work, therefore, has to hide its diminished head when contrasted with some of the Persian buildings in which a faint survival of that magnificence can be traced. He describes the remains of the Mosque at Tabreez (which is supposed to be a thirteenth-century building), having walls covered with glazed and coloured bricks. He says:—"Europe possesses no specimen of any style of ornamentation comparable with this. The painted plaster of the Alhambra is infinitely inferior, and even the mosaic painted-glass of our cathedrals is a very partial and incomplete ornament compared with the brilliancy of a design pervading the whole building and entirely carried out in the same style." The narrow entrance to the Mosque is approached by a vast portal that might have served a purpose similar to the atrium of a basilica. It is used by Mr. FERGUSON to suggest the inferiority of the architects of the Giaour. "The Gothic architects," he writes, "attempted something of this sort by making the outer openings of their doors considerably larger than the inner, in other words, by 'splaying' widely the joints of their portals. By this means, in some of the French cathedrals the appearance of a very large portal is obtained with only the requisite and convenient size of opening; but in this they were far surpassed by the architects of the East, whose lofty and deeply-recessed portals are unrivalled for grandeur and appropriateness." The Mosque at Ispahan is said to "present a scene of gorgeous, though it may be somewhat barbarous, splendour almost unequalled in the whole world." Another Persian building that was erected ages earlier, the Hall of Xerxes at Persepolis, is also set above Egyptian as well as European buildings, for "its size and proportions, combined with the lightness of its architecture and the beauty of its decorations, must have made it one of the most beautiful buildings ever erected."

DE QUINCEY tells us that in the early stage of his malady of opium-eating, the splendours of his dreams were chiefly architectural, and he beheld such pomp of cities and palaces as never appeared before the waking eye unless in the clouds. May we say that Mr. FERGUSON had also his architectural dreams? We must all be subject for life to the power that first awakened any of our faculties, and as the gorgeousness of the East excited within him other desires besides the accumulation of rupees, it is no wonder if his artistic sense was ever longing for satisfaction by means of something that would recall the East. When he told his sister in one of his letters about the difference between the commonplace East India Company's cities, where everyone went on foot and in plain muslin, while at Lucknow "no man with any pretensions to respectability goes out without half a dozen of footmen in gay liveries moving alongside, and as many horsemen with spears and matchlocks prancing before and behind his palanquin," he was revealing the real germ of his Theory of Beauty. "Who does not love," he went on, "to read of the gay pageants of our forefathers, or who does not love to gaze on the poor imitations of them sometimes you get up at coronations or civic feasts?"

A Western artist, poet, litterateur, or any one whose imagination held sway would easily surrender himself to Eastern influences and imagine he was to the manner born. Mr. FERGUSON was too strong in character for that sort of change. He could believe that the Turanians were gifted beyond all other races in appreciation of form, an extraordinary passion for coloured decoration, and an instinctive

knowledge of the harmony of colours. But destiny had made him an Aryan, even a typical Aryan, and the shortcomings of his mind with respect to art were racial attributes which were not to be overcome. Are not many of the characteristics of the spirit which inspired his own criticisms on buildings suggested by what he says about the inherent peculiarities of the Aryans?

Convenience is the first thing which the practical common sense of the Aryan seeks, and then to gain what he desires by the readiest and the easiest means. This done, why should he do more? If, induced by a desire to emulate others, he has to make his building ornamental, he is willing to copy what experience has proved to be successful in former works, willing to spend his money and to submit to some inconvenience; but in his heart he thinks it useless, and he neither will waste his time in thinking on the subject, nor apply those energies of his mind to its elaboration, without which nothing great or good was ever done in Art. In addition to this, the immaterial nature of their faith has always deprived the Aryan races of the principal incentive to architectural magnificence. The Turanian and Celtic races always have the most implicit faith in ceremonial worship and in the necessity of architectural splendour as its most indispensable accompaniment. On the other hand, the more practical Aryan can never be brought to understand that prayer is either more sincere, or is more acceptable, in one form of house than in any other. He does not feel that virtue can be increased or vice exterminated by the number of bricks or stones that may be heaped on one another, or the form in which they may be placed; nor will his conception of the Deity admit of supposing that He can be propitiated by palaces or halls erected in honour of Him, or that a building in the Middle Pointed Gothic is more acceptable than one in the Classic or any other style. This want of faith may be reasonable, but it is faithful to poetry in Art, and, it is feared, will prevent the Aryans from attaining more excellence in architectural art at the present time than they have done in former ages.

"Jeder Schriftsteller schildert sich einigermaßen in seinen Werken, auch wider Willen, selbst," says GOETHE, or, in other words, a book becomes a portrait of its author. In what Mr. FERGUSON says about races, and especially the Turanian and Aryan, we have a self-revelation of capabilities and aspirations. As happens with many other examples of modern literature, we can see why there is a sort of duality in his criticism. Like BRUTUS in the play, he is with himself at war, for sometimes he supposes he is a Turanian, sometimes he is convinced he is an Aryan, and his criticism corresponds with his moods. Does an architect, like the designer of Antwerp Cathedral, arrange his plan to correspond with the requirements of the clergy and laity who employed him, he is judged from a Turanian point of view, and is condemned because he did not make effect paramount. Four centuries ago the church of San Zaccaria was erected in Venice. The architects, in order to allow the congregation in the side aisles to see the high altar, avoided massiveness in their piers, following the precedents of the Italian Mediæval churches. Mr. FERGUSON blames them, because they did not perceive "the artistic value of numerous points of support, nor the importance of superabundant strength in producing architectural effect." The Turanian idea is expressed in these words, but in the very next sentence the Aryan spirit asserts itself, for we are informed that, "notwithstanding the defect, the Cinquecento construction was always truthful, and so far more pleasing than that of the subsequent age, when the most prominent parts of the design were generally added for effect only."

It would be easy to cull numerous instances in which the duality of Mr. FERGUSON's system is seen. Praise is mingled with blame, and a building is admired and condemned in the same sentence. It may be supposed that canons of criticism should be inflexible, but in them, as in morality, more or less elasticity has to be admitted. In our opinion the inconsistency imparts a human, a nineteenth century character, to Mr. FERGUSON's work. He expresses the thoughts of a compound, it may be a discordant, individuality that in a measure corresponds with the nature of the readers. How many architects are there in Britain who would have the courage to make a public profession of devotion to one style alone, or who would print and publish a set of principles as expressions of their faith? The most that can be expected of mortals in these days is to endeavour to be useful, in spite of misgivings about the ultimate utility of being useful. Mr. CARLYLE was acting according to Aryan instincts when he worshipped in the Temple of Immensity. At the same time it is to be hoped for all our sakes that rich men will believe with HAMLET, they must build churches, or else shall they suffer not thinking on. Parish Councils, unlike churches, are an Aryan institution,

for Mr. FERGUSSON tells us that "the village system which the Aryans introduced into India is still the most remarkable of its institutions; these little republican organisations have survived the revolutions of fifty centuries." But if they are to endure for a tithe of that time in England Aryan precedents will have to be departed from, including open-air meetings and comfortable assembly-rooms will have to be erected all over the land. When they are set up and paid for, let them be amenable to criticism according to Mr. FERGUSSON's Turanian and Aryan principles. The contractors at least will not complain.

If pushed to a rigorous conclusion from his own data, Mr. FERGUSSON's books on architecture are not needed. Assume it to be true that "beauty cannot be combined with sense," and that "wherever the Aryans appear art flies before them," is it not then resistance to eternal laws to advocate a combination of art and sense and to retain art from running away? Agriculture, manufactures, commerce, shipbuilding and road-making are the useful arts which Mr. FERGUSSON recognises as being open to Aryans. The late Mr. AYRTON came to a similar conclusion when he bracketed market-gardening with architecture. We know, however, that if destiny cannot be overcome, yet, after a good fight, it is ready, to come to a compromise. If we admit with Mr. FERGUSSON that, "had there been no Pelasgi in Greece there probably would have been no architecture of the Grecian period," we must allow that the Aryan Greeks did somehow continue to cultivate the art in spite of nature and fate. If as much success can be obtained in other barren and unsuitable soils, philosophers and ethnologists need not complain. If the races who are predestined to be architects can produce something infinitely superior, the Cagots of the art in Western lands are always likely to rejoice. At the same time, the sending out of raw Aryans from South Kensington to revolutionise the architecture and other arts of the Turanians is an undoubted insult to destiny, and merits no slight punishment.

THE LATE JOHN CHESSELL BUCKLER.

IN our last number we recorded the death of the Nestor of English architects, Mr. John Chessel Buckler, of Melbury, Cowley St. John, Oxford, which took place on the 5th inst. He completed his century a month earlier, on December 8 last. He was the eldest son of John Buckler, F.S.A., by Ann his wife, daughter of John Chessel, and was born December 8, 1793.

From his father, who at an early age was articled to Mr. Charles Thomas Cracklow, of St. John's, Southwark, architect and surveyor, John Chessel Buckler inherited his taste for the study of architecture, and consummate skill in its delineation, composition and practice. His numerous volumes of original sketches in pencil are an enduring monument of unwearied industry and talent, evincing careful attention to the design, construction, minute expression and elaboration of every detail of Mediæval work. He received lessons from Nicholson, the water-colour artist, and his own drawings, of which many were exhibited in the Royal Academy, have a touch of native genius rarely if ever surpassed. His life was one long devotion to art, from childhood to old age.

The preservation of his excellent eyesight, and the steadiness of his hand, enabled him dexterously to employ the colour brush after he had attained his 91st year upon several interesting subjects, amongst them the gateway of Carisbrooke Castle; the church of Calbourne, in the Isle of Wight, where his father was baptized; and the church of Melbury Bubb. Dorset, built by his kinsman, Walter Bokeler, rector, 1466-1513, by the gift of William Fitzalan, Earl of Arundel, Lord Maltravers, K.G., with the tomb of Alexander Buckler, of Wolcomb Maltravers, his own ancestor, who died in 1568.

Mr. John Chessel Buckler's etchings were masterly, as testified by his quarto volume of the "Cathedrals of England and Wales," published in the year 1822; his dear friend Mr. John Gage's "History of Hengrave," and other works. He wrote an account of Eltham Palace; "Observations on Magdalen College, Oxford;" on the "Restoration of Lincoln Cathedral," and papers in the *Gentleman's Magazine*.

For his design for rebuilding the Houses of Parliament, after the fire of 1834, Mr. J. C. Buckler had the honour to receive the second premium, thankful that he did not obtain the first, in which case he said that "he should have been in his grave long ago."

He delighted in the faithful restoration of churches, mansions, and other ancient buildings, amongst them the cathedrals of Lincoln and Norwich, and Hengrave Hall, Suffolk, in 1820; and Oxburgh Hall, Norfolk, in 1830.

In 1826 was commenced, from the designs of Mr. J. C. Buckler, the magnificent structure of Costessey, near Norwich, the seat of Lord Stafford, of which the grand features, bay windows, moulded brickwork, turrets, clusters of chimneys, chimney-pieces, oak panelling, doorways, doors, and richly carved work are unsurpassed. The designs and moulds made expressly for this work at the Cossey brickyard have been reused till the present time in London and in the country.

The Training College at Chester and the Institution for the Daughters of Clergymen at Warrington were built from his plans in 1836; St. Mary's Church, Dover, in 1843; Butleigh Court, Somerset, and Dunston Hall, Norfolk, in 1850; new churches at Tilney St. Lawrence, Walpole St. Peter and Wilney, Norfolk; the restoration of the chapel, Magdalene College, Cambridge; the restoration of the belfry, spire and pinnacles of St. Mary's Church, Oxford, in 1850; the Choristers' School, Magdalen College, Oxford, in 1849 (the foundation-stone was laid by the Rev. J. M. Routh, president, attended by John Buckler, F.S.A., John Chessel Buckler and Charles A. Buckler); the restoration of the old tower gateways of Oriel College and Brasenose; the restoration of Jesus College and the erection of the new tower gateway; the restoration of the Norman circular west window of Iffley Church, which had been sadly mutilated; last, not least, the mansion of Longridge Towers, Northumberland, for Mr. Hubert Jerningham.

In many of these important and interesting works Mr. John Chessel Buckler was assisted by his eldest surviving son, who was also associated with him in the "Remarks upon Wayside Chapels and the Chantry on Wakefield Bridge" (J. H. Parker, 1843), and the "History of the Architecture of St. Albans Abbey" (Longman & Co., 1847).

On May 12, 1818, John Chessel Buckler was married to Esther, daughter of Captain Thomas Fair, descended from Colonel Robert Phaire, or Faire, of Rostillon and The Grange, in the county of Cork, who went into Ireland in 1649, by Elizabeth his second wife, daughter of Sir Thomas Herbert, of Tintern, co. Monmouth, Bart., the traveller and antiquary, groom of the chamber to King Charles I., whom he faithfully attended during the last two years of His Majesty's life. Mrs. J. C. Buckler died on September 9, 1882, aged 85 years, leaving issue four sons and two daughters.

THE ANTONINE WALL.

THE following letters have passed between the Secretary of the Glasgow Archaeological Society and the Inspector of Ancient Monuments respecting the "feuing" for building purposes of a portion of the line of the Antonine Wall, near Falkirk, and the subsequent erection of a small villa, in which part of one of the best-preserved sections of the Antonine Wall, a relic of the Roman occupation of Britain, has been destroyed:—

Glasgow Archaeological Society, 211 Hope Street,

Glasgow: January 2, 1894.

Lieutenant-General Pitt-Rivers, D.C.L., F.R.S., F.S.A.,
Inspector of Ancient Monuments, Rushmore,
Salisbury.

Sir,—I have been instructed by the Council of the Glasgow Archaeological Society to bring under your notice the destruction of part of an excellently-preserved portion of the Antonine Wall, near Falkirk. The wall at this point runs through the property of Mr. Forbes, of Callendar, who unhappily is not interested in its preservation. He has recently granted a feu for building purposes of a piece of ground near Lock 16, situated on the direct line of the wall, and the consequence has been the erection of a villa with its foundation actually laid across the fosse. This is, of course, very much to be deplored, but it is to be feared that the feuing operations which have thus been commenced may be proceeded with, and that this most admirably-preserved section of the wall may be eventually altogether destroyed. Mr. Forbes is the proprietor of a lengthened stretch of the best-marked part of the wall, and in these circumstances it has appeared to the Council most necessary that an effort should be made to press upon his attention the extreme desirability of his taking steps to preserve so interesting a relic of the Roman occupation and the great and irreparable loss which would be caused by its destruction. I recently addressed a communication to Mr. Forbes on the subject, but I regret to say that he seems indisposed to give effect to any suggestions for the preservation of the wall. At the last meeting of the society a resolution in the subjoined terms was moved by the president, Professor Fergusson, LL.D., seconded by David Murray, LL.D., and unanimously agreed to:—"The society records its extreme regret at the action of the proprietor in feuing for building purposes at Lock 16, near Falkirk, a portion of the Roman wall, on which already a small villa has been erected, with its foundations actually laid across the fosse, at that point admirably preserved." Copies of the resolution were directed to be forwarded to Mr. Forbes, the Society of Antiquaries of London, the Society of

Antiquaries of Scotland, Sir Herbert Maxwell, Bart., M.P., Sir John Lubbock, Bart., M.P., Sir George Trevelyan, Bart., M.P., Secretary of State for Scotland, and yourself. I shall be greatly obliged if you can see your way to give any help to the society in its efforts for the preservation of the wall, or to offer any suggestions as to our future procedure.—I am, &c.,

J. DALRYMPLE DUNCAN, Hon. Sec.

Rushmore, Salisbury: January 4, 1894.

Sir,—In reply to your letter of January 2, 1894, and previous correspondence on the same subject, you will probably remember that when I first drew your attention to this matter in my letter to you of December 26, 1888, Mr. Forbes, of Callendar, was communicated with and he declined to enter into a correspondence on the subject. The Act of Parliament is purely permissive and has no power to compel owners to protect their ancient monuments, or to place them under the Act. The Act is now virtually in abeyance, as the Government are not anxious to increase the number of monuments for which they are responsible, when it is found that owners as a rule take great interest in them and protect them far better than could be done by the State. I retain the post of Government inspector only as an honorary appointment, at the request of the First Commissioner of Works, for the purpose of assisting in any case, such as this, in which a difficulty may arise. This, however, is the only instance that has occurred since the Act was established in 1882, in which an owner has been found unwilling to take any steps for the protection of a monument on his property. Many owners have refused to avail themselves of the Act, but the reason assigned has always been that, taking great interest in the remains, they feel that, living on the spot, they are in a better position to look after them than any Government inspector, in which opinion I entirely concur. This case, however, differs from others inasmuch as the Roman Wall covers a large tract of country, and if it can be shown that the value of the land is capable of being increased by letting any part of it on building leases, the owner is undoubtedly entitled to compensation if any arrangement is come to for the preservation of the works, or if any measure should hereafter be passed for the compulsory sale of the land for this purpose. But when it is considered that this is the only instance throughout the country in which an owner has refused either to preserve a monument himself or to allow it to be preserved by the Government, I think it is evident that the demand for compulsory legislation is very slight, and I do not know how it is to be met in this instance, except by endeavouring to form a strong public opinion of the more educated and intelligent portion of the community in favour of the protection of the earthworks. I think it would be difficult for any landowner to stand against a very pronounced public judgment upon the subject, and this can only be done by local influence. This work is not a mere Scotch monument; it is more even than a national monument. Being the most northerly boundary of the Roman Empire, it is of interest to the whole civilised world, and the nation that allows the last vestiges of such a work to perish will stand badly by the side of others that take a more enlightened view of such matters, and more especially the German Government, which is now spending a large sum upon the exploration and protection of the Limes Romanorum, which bounds the area of the Roman Empire on that side. I will bring the subject of your letter again to the notice of the First Commissioner of Works, but without a change in the Act of Parliament, a change for which, as I have said, there is but little demand, because the present Act during the first years of its operation had the effect of greatly increasing the interest of the public in ancient monuments, and causing them to be better respected by their owners, nothing can be done compulsorily, and persuasively there is but one means in moving the owner, in whose hands it now rests to do as he likes with the earthworks. I would suggest, however, that, as a preliminary to further measures, it might be well to ascertain as far as practicable what the value of the land occupied by the wall on Mr. Forbes's property amounts to. Compensation there must and ought to be. The Act enables Government to acquire land for the preservation of monuments. In a case of such unusual interest, this course might possibly (I speak only in my private capacity as an archaeologist) be entered upon with the consent of the owner.—I am, &c.,

A. PITT-RIVERS, Inspector of Ancient Monuments in Great Britain.

J. Dalrymple Duncan, Esq.

Acting on the suggestion of General Pitt-Rivers, the secretary has asked Mr. Forbes, previous to feuing or otherwise disposing of any further part of the line of the wall, to be good enough to have the value of the ground ascertained, in order that the position of matters may be reported to the Inspector of Ancient Monuments, and brought generally under

the notice of people interested in the preservation of important relics of the past. He has also suggested that, failing any arrangement as to the acquisition of the ground, it might be possible, in granting feus which include any portion of the wall, to insert provisions prohibiting the erection of buildings either on the rampart or the fosse, and making it a real burden on the feu-right that neither of them should be interfered with. It was also pointed out that in the eyes of many people it would add materially to the value of a house that the adjoining garden contained a portion of the Roman Wall.

THE MYLNES IN EDINBURGH.

AT the last meeting of the Edinburgh Architectural Association, a paper by the Rev. Robert Scott Mylne, Great Anwell, Herts (author of "The Master Masons to the Crown of Scotland"), on "The Influence of the Mylnes on the Architecture of Edinburgh," was read. The communication sketched in some detail the connection of the various members of the Mylne family with Scottish architecture generally, and local architectural and kindred work in Edinburgh in particular. It was mentioned that the North Bridge was the last important work executed by the family of Mylne, and it was held that an honourable connection had been maintained for many years between them and the city, and that a distinct impress of their skill was left on many parts of the ancient town. Some of their works had been destroyed by modern improvements or injured by the lapse of time, but others remained as instances of their enduring industry and handiwork. Of the merit or demerit of these the writer was hardly qualified to speak; but he thought that, in reference to Edinburgh and elsewhere, there could be no doubt that the Palace of Holyrood was by far the most important structure connected with the name of Mylne. Dr. R. Rowand Anderson, in moving that the thanks of the Association be conveyed to Mr. Mylne for his paper, alluded to the North Bridge, and said that, in reference to the proposal for rebuilding, it was to be hoped that the claims of architecture would not be kept in the background. If the scheme should be looked upon solely as a piece of engineering to span a certain space, irrespective of everything else, it would be a great misfortune to the city of Edinburgh. If, should it ever be resolved to rebuild the structure, whether in iron or stone, the citizens did not insist on a design worthy of the architectural reputation of the city and of this unequalled site, there would be a blot cast on the town that would remain for generations. Mr. S. Henbest Capper, in seconding, endorsed the views of the last speaker as to the bridge that connects the New and the Old Town of Edinburgh.

TESSERÆ.

Japanese Temples.

THE architecture of the Shin-to temples is derived from the primeval hut, with more or less modification in proportion to the influence of Buddhism in each particular case. Those of the purest style retain the thatched roof; others are covered with the thick shingling called *hiwada-buki*, while others have tiled and even coppered roofs. The projecting ends of the rafters, called *chigi*, have been somewhat lengthened and carved more or less elaborately. At the new temple at Kudanzaka in Yedo they are shown in the proper position, projecting from the inside of the shingling; but in the majority of cases they merely consist of two pieces of wood in the form of the letter X, which rest on the ridge of the roof like a pack-saddle on a horse's back—to make use of a Japanese writer's comparison. The logs which kept the two trees laid on the ridge in their place have taken the form of short cylindrical pieces of timber tapering towards each extremity, which are compared by foreigners to cigars. In Japanese they are called *katsuo-gi*, from their resemblance to the pieces of dried bonito sold under the name of *katsuo-bushi*. The two trees laid along the roof over the thatch are represented by a single beam, called *munaosai*, or "roof-presser." Planking has taken the place of mats, with which the sides of the building were originally closed, and the entrance is closed by a pair of folding doors, turning, not on hinges, but on what are technically called "journals." The primeval hut had no flooring; but we find that the shrine has a wooden floor raised some feet above the ground, which arrangement necessitates a sort of balcony all round and a flight of steps up to the entrance. The transformation in some cases obtained by the addition of a quantity of ornamental metal-work in brass.

Treatment of Gothic Forms.

Buttresses in a pointed composition must not be considered simply as buttresses, or supports to the angles, or sides of a structure, any more than a cornice in horizontal composition may be thought only necessary to cover or protect the wall on

which it rests. That these were the uses for which they were severally applied originally cannot perhaps be doubted; but although they may be useful as such, we must now consider them as aids to architectural effect. Buttresses, then, are of the same use in the vertical style that cornices are in the horizontal—to give character to an elevation by throwing a mass of shadow, to relieve it of the monotony necessarily attendant on a flat surface however it may be pierced or enriched. The sides of the buttresses should be either quite perpendicular the whole height they have to run, or be slightly diminished, if the wall behind them diminishes, in lengths and not by inclined lines. Their faces must run up vertically to the sets-off, and these should be in the same inclined line, and that line pointing to the apex of their pinnacles, when pinnacles surmount them. Indeed it cannot be too strongly enforced that there should be a constant tendency in the outlines of compositions in this style to meet, although the surfaces be themselves so generally perpendicular; and the more acute the angle under which they incline, the more graceful and becoming the style the result will be. The commanding lines of every part of a composition should lead through from its summit to the base. Thus a spire or pinnacle should rest on a tower or turret whose angles are not interrupted, but never on a merely flat wall, however it may be faced with buttresses to give an apparent projection. Neither should low porches be projected from the face of a structure, for such can only have the effect of excrescences and tend to injure a composition; nor should external doors be made but in places where the harmony of the composition is not injured by them as irregular apertures. Internally square forms are seldom used, but piers consist of clustered cylindrical shafts, and thin shafts of the same form, lofty and uninterrupted by crossing lines, act as pilasters. On these, capped with deeply inflected congeries of mouldings or foliage for the former, and lighter ones made continuous and breaking round them for the latter, rest the arches and arched ceilings. Flat surfaces are susceptible of high enrichment by means of tracery and panelling; mouldings are enriched not by carving on them but by rounding out foliage and other ornament in covings and other deep inflections. Corbels should not be substituted for shafts to support arches when it can be avoided; but they have a pleasing effect as supports to the dripstone or canopy of a door or window; and indeed there are many other situations in which they are almost necessary, but they should always be considered as succedaneous, and not as necessary to a composition. To avoid glaring inconsistencies in composing, it will be well to adhere generally to the style of some particular period, and to employ the proportions and enrichments as well as the forms peculiar to it; but, nevertheless, a more ornate may superimpose a plainer part, so that the difference be not violent. Windows of the second period may be placed over an arched composition of the first, and appear naturally to result from it; but the transition would be so great from the first to the third as to make the result inharmonious. It need not, however, be denied to those who feel themselves competent to use the materials with good taste and propriety, to select matter from examples of the various periods, and make compositions not exactly in the style of any of them.

Sand in Mortar.

There are cases in which sand of a peculiar kind, within certain limits, improves mortars; but, as a general rule, the action of sand must be injurious to their strength, and the only valid reason that can be given for its employment is the advantage gained in the first cost of a structure by the saving effected in material. In estimating the probable effect of sand upon mortar, four points present themselves for consideration: the cohesion of the particles of the cementing material; their adhesion to the surfaces of the sand; the increase of strength that may arise when the sand is stronger than the cementing material, from the fracture having to take a longer path than it would where no sand intervenes to break the direct passage in one plane; and the possibility of weak points occurring from several particles of sand remaining in contact without a sufficiency of cementing material to envelop them, and completely fill up their interstices. The latter consideration affects all descriptions of sand—whether granitic, calcareous or argillaceous—pretty equally, and, so far as this cause of weakness exists, the strength of mortar must suffer deterioration. So far as the particles of sand break joint, as it were, and thus lengthen the path of the fracture, something doubtless is gained by its use, especially when the sand is intermixed with gravel and its grains are of various sizes. In respect to the question of adhesion as compared with cohesion, wide differences may be supposed to exist, according to the nature of the surface of the sand, whether rough or smooth, and according as the lime is capable or not of exerting a chemical action upon it. Now, as far as is known, the lime of mortar has no practically appreciable action upon quartz sand; and, therefore, as the greater part of our sand in this country is granitic, the adhesion of the lime to it must be independent of chemical effect; meaning by this term the formation of any

new compound. In France, however, a sand is found, termed an *arène*, which is a description of puzzuolana, and the employment of this sand has a decidedly beneficial action upon lim-mortar. A ferruginous sand, found in the gravel pit close to Prince Frederic's Bastion, on the Chatham Lines, possesses similar qualities, and it is probable that brickdust and burnt clay, as in some instances they form fair substitutes for puzzuolana, would also, in a coarse state resembling sand, have also a beneficial effect both on pure and hydraulic limes, though not perhaps on cements, because these naturally contain all, or nearly all, the clay which the lime can chemically combine with. But with the majority of sands such chemical action is wanting, and the sand and lime particles hold together with the force of adhesion only. Experiments show that with most surfaces this force, as can readily be conceived, is less than that of the cohesion between the particles of lime. The addition of sand, therefore, generally introduces an element of weakness into mortars in this way also. The loss of strength in respect of this will be greater in proportion as the sand is finer, and as the quantity is increased, for by enlarging the extent of surface over which adhesion takes the place of cohesion, not only is something absolutely abstracted from the resistance of the aggregate mortars, by a lesser force being substituted for a greater, but the chance of weak points, from a deficiency of cementing material between the particles of sand, is increased.

Early Christianity and the Arts.

The arts had to suffer from the establishment of Christianity, and we may notice its beginning when, at Ephesus, an uproar arose among the artists because Paul had taught "that there be no gods which are made with hands"; by which the temple of the great goddess Diana was likely to be despised and her magnificence destroyed. The genius of the Grecian artists had been principally displayed in forming the effigies of their deities. What, then, was to be expected from the influence of a system of which the leading tenet was that "there be no gods that are made with hands"? What was apprehended at Ephesus was equally to be expected wherever that system should prevail. The artists would be left without employment, the temples without worshippers and their idols derided or destroyed. Zeal, properly enlightened, would easily have discriminated between the works of men's hands and their abuse. It would have spared the temples which might be adapted to better purposes, and while it ridiculed their worship, would have preserved the statues as monuments of art. The temples, as we know, were often spared, and there is a law of Honorius which prohibited sacrifices but directed the edifices not to be destroyed. At this time it not unfrequently happened that new edifices for Christian worship were constructed from old materials, and the skill of the artist was sometimes manifested in a monstrous junction of bases and capitals. Many ornamental parts were at the same time taken to embellish the palaces of the great. The statues, for which heathenism had expressed a religious veneration, experienced a worse fate. But can we be surprised? Look to the iconoclasm of the eighth century in the East, and to that of our own country in a much later period, when the *Apollo of Belvedere*, or any other exquisite specimen of art, had they been said to represent a Christian saint, would have been dashed to pieces or crumbled into dust by its impetuous fury. Fanaticism never differs from itself. The civilised nations of Europe, and particularly Italy, have expiated the extravagant superstition of their ancestors by the encouragement which they have since given to the arts, and by the veneration with which every fragment has been preserved which time, barbarism and fanaticism had spared. The establishment of Christianity, then, or rather the misguided zeal of its votaries, was adverse to the fine arts. In another sense, the very spirit of that religion was adverse to their encouragement. When the Greeks exhibited the images of their deities the talents of the greatest masters were employed. But the God of the Christians, as being abstracted from matter and infinite in His attributes, could not be brought within the grasp of sense or delineated under any palpable form, however grateful or sublime. To make the attempt was an act of impiety, for it degraded His nature and annulled His essence.

Antiquity of Egypt.

The value of the phenomena of the annual sedimentary deposits of the Nile in Egypt as a test of the lapse of time during which that most recent and still operating geological dynamic has been in progress, was sagaciously discerned by Mr. Leonard Horner. In two memoirs communicated to the Royal Society in 1855 and 1858, the results of ninety-five vertical borings through the alluvium thus formed are recorded. In the excavations near the colossus of Rameses II. at Memphis, there were 9 feet 4 inches of Nile sediment between eight inches below the present surface of the ground and the lowest part of the platform on which the statue had stood. Supposing the platform to have been laid in the middle of the reign of that king—viz. B.C. 1361—such date added to A.D. 1854 gives

3,215 years during which the above sediment was accumulated, or a mean rate of increase of $3\frac{1}{2}$ inches in a century. Below the platform there were 32 feet of the total depth penetrated; but the lowest 2 feet consisted of sand, below which it is possible there may be no true Nile sediment in this locality, thus leaving 30 feet of the latter. If that amount has been deposited at the same rate of $3\frac{1}{2}$ inches in a century, it gives for the lowest part deposited an age of 10,285 years before the middle of the reign of Rameses II., and 13,500 years before A.D. 1854. The Nile sediment at the lowest depth reached is very similar in composition to that of the present day. In the lowest part of the boring of the sediment at the colossal statue in Memphis, at a depth of 39 feet from the surface of the ground, the instrument is reported to have brought up a piece of pottery. This, therefore, Mr. Horner infers to be a record of the existence of man 13,371 years before A.D. 1854: "of man, moreover, in a state of civilisation, so far, at least, as to be able to fashion clay into vessels, and to know how to harden them by the action of a strong heat." Professor Max Müller has opened out a similar vista into the remote past of the history of the human race by the perception and application of analogies in the formation of modern and ancient, of living and dead languages.

Influence of Mediæval Construction.

The combination of masonry and carpentry in building tended greatly to the advancement of both; for, it being required at times to make them act independently of each other, additional science and art were necessary, as the proportions must be retained that were given to similar works in which they co-operated. Hence the wondrous skill evinced in the vaulted roofs and ceilings, in the towers and lofty spires, of some of our Pointed cathedrals for the one, and the splendid piece of construction in the roof of Westminster Hall for the other. To this point Sir William Chambers, who was no depreciator of the merits of the Romans in architecture, says:—"In the constructive part of architecture the ancients do not seem to have been great proficient." Then, having referred many of what he calls the "deformities observable in Grecian buildings" to want of skill in construction, he continues:—"Neither were the Romans much more skilful; the precepts of Vitruvius and Pliny on that subject are imperfect, sometimes erroneous, and the strength or duration of their structures is more owing to the quantity and goodness of their materials than to any great art in putting them together. It is not, therefore, from any of the ancient works that much information can be obtained in that branch of the art. To those usually called Gothic architects we are indebted for the first considerable improvement in construction. There is a lightness in their works, an art and boldness of execution, to which the ancients never arrived, and which the moderns comprehend and imitate with difficulty. England contains many magnificent specimens of this species of architecture, equally admirable for the art with which they are built, the taste and ingenuity with which they are composed." To this Gwilt, in his edition of Sir William's work, adds in a note, "there is more constructive skill shown in Salisbury and others of our cathedrals than in all the works of the ancients put together."

Gainsborough and Reynolds.

Gainsborough, so far from writing, scarcely ever read a book, but for a letter to an intimate friend he had few equals and no superior. It was like his conversation, gay, lively, fluttering round subjects which he just touched, and away to another, expressing his thoughts with so little reserve that his correspondents, considering the letter as a part of their friend, had never the heart to burn it. Sir Joshua's character was most solid, Gainsborough's most lively. Sir Joshua wished to reach the foundation of opinions. The swallow, in her airy course, never skimmed a surface so light as Gainsborough touched all subjects; that bird could not fear drowning more than he dreaded deep disquisitions. In one thing, and in one only, they perfectly agreed—they each possessed a heart full-fraught with the warmest wishes for the advancement of the art they professed, of kindness to their friends, and general benevolence to men of merit, wherever found and however distinguished.

Foundations.

No foundation is more ineligible for a heavy structure than one that is rocky, especially if the rocks are in small masses, or if a sufficient surface is offered of one mass, in strata which dip considerably: in the former case, from the rottenness of the soil in which rocks are generally bedded and which consists for the most part of their detritus; and in the latter, from the liability of stratified rock to crack and slip, against which no precaution is available. Dry gravelly soils, again, are not only loose and infirm, but are exceedingly liable to vacuities of various extent, which are hardly sufficiently provided against by piling: wet gravel is generally more compact and may be better trusted both with and without piles. A deep compacted sand will be found firm if a sufficient surface of it be embraced

by the footings, which should be wider in that than most other cases. In large and deep beds of alluvial deposits the heaviest building may be laid with security, if precautions be attended to for the equal distribution of the pressure throughout. The city of New Orleans, in a delta at the mouth of the Mississippi, rests on a bed of mud, which is held together by a bonding of trunks and arms of trees, but on a broad level bed below. Here the only precaution taken in erecting a structure of the greatest magnitude is to make the trenches for the walls wide and level, and to floor the whole of their surface with thick planks properly bonded: on these the footings are laid, and if any settlement occurs it is of the whole edifice and no injury accrues to any part of it at any time. Clayey and chalky soils are generally understood to form the best natural foundations; in these, under ordinary circumstances, no preparation is required, though for very heavy and unequally pressing works, such as bridges, which are placed on piers made as small as they possibly can be, piling has been considered a necessary precaution. Indeed, except perhaps on an extensive horizontal bed of firm compact rock, no foundation can be considered better than that afforded by piling in a deep clay.

Roman Corinthian.

The less refined taste of the Romans could not appreciate the simple grandeur and dignified beauty of the Doric as it existed in Greece. They appear to have moulded it on what we suppose their own Tuscan to have been, and the result was the mean and characterless ordinance exemplified in the lowest storey of the Theatre of Marcellus at Rome and in the Temple at Cora, between thirty and forty miles south of that city. Not less inferior to the Athenian examples of the Ionic order than the Doric of Cora is to the Doric of Athens are the mean and tasteless deteriorations of them in the Roman temples of Manly Fortune and Concord. It was different, however, with the foliated Corinthian, which became to the Romans what the Doric had been to the Greeks—their national style. But though they borrowed the style, they did not copy the Greek examples of it. In Rome the Corinthian order assumed a new and not less beautiful form and character, and was varied to a wonderful extent, but without losing its original and distinctive features. The example of the Temple of Vesta at Tivoli hardly differs less from that of the Temple of Jupiter Stator in Rome than the latter does from the ordinance of the Choragic monument of Lysicrates at Athens, and all three are among the most beautiful examples of the Corinthian order in existence—if, indeed, they are not pre-eminently so—and yet they do not possess a single proportion in common. It must be confessed, moreover, that if the Romans had not good taste enough to admire the Doric and Ionic models of Greece they had too much to be fond of their own, for they seldom used them. Both at home and abroad, in all their conquests and colonies, wherever they built, they employed the Corinthian order. Corinthian edifices were raised in Iberia and in Gaul, in Istria and in Greece, in Syria and in Egypt, and to the present day Nismes, Pola, Athens, Palmyra and the banks of the Nile alike attest the fondness of the Romans for that peculiar style. The generally received opinion that Greek architects were employed by the Romans after the connection between the two countries took place is not indisputable, for the difference between the Greek and Roman styles of architecture is not merely in the preference given to one over another peculiar mode of columnar arrangement and composition, but a different taste pervades even the details; though the mouldings are the same, they differ more in spirit and character than do those of Greece and Egypt, which certainly would not have been the case if Roman architecture had been the work of Greek architects. Indeed, were it not for historical evidence, which cannot absolutely be refuted, an examination and comparison of the architectural monuments of the two countries would lead an architect to the conclusion that the Corinthian order had its origin in Italy, and that the almost solitary perfect example of it in Greece was the result of an accidental communication with that country modified by Greek taste, or that the foliated style was common to both without either being indebted to the other for it.

Italian Arcading.

The practice of the Italian school in the composition of arcaded ordinances may be generally followed with advantage, except in mingling and confusing them with columnar. The pier is based by a deep square plinth, and surmounted by a square or moulded cap or impost, the upper surface of which is the base line of the arch. In rusticated work the radiating stones of the arch show their joints, and are cut to a uniform appearance with the ordinary surface of the wall. In other cases there is a moulded archivolt, whose width varies from an eighth to a tenth of the opening of the arch. A dropping keystone is generally used, but this very much injures the simplicity, and consequently the beauty, of the arch, and should be avoided. The most graceful average proportion for arcades is, that the opening be twice the width of the pier, and twice its own width in height to the crown of the arch.

NOTES AND COMMENTS

ALTHOUGH the late PAUL BAUDRY died when he was a young man he was accepted as one of the masters of the French school of painting. There is no theatre which contains examples of decoration to surpass those which he executed in the *foyer* of the Opera House, Paris. His subjects were ideal, and the *Cities of Italy*, belonging to the Duchesse de GALLIERA, which were reproduced in *The Architect*, might be taken as representative of the majority of his works. It is no wonder, therefore, that Madame BAUDRY, the widow of the artist, was astonished when she saw her husband's name on the frame of an *Attaque du Village* in the windows of a picture-dealer. The lady protested, but the dealer was able to show her the catalogue of the sale at which it was purchased, with the guarantees of experts. A few days afterwards her son went to the shop, and, without giving his name, bargained for the picture. After agreeing about the price he ordered the picture to be sent to his house. When he obtained possession of it, M. BAUDRY declined to pay the dealer on the ground that the picture was a counterfeit. The dealer at once invoked the aid of the law to obtain the restitution of his property, as well as damages for violence. Madame BAUDRY declared her willingness to return the picture on the condition that her husband's name was effaced. The Tribunal came to the conclusion that it must be left to an expert to decide upon the authenticity of the work, and, in case his opinion was adverse, whether the dealer was justified in exposing the picture for sale. In the meanwhile the picture is to be sent back to the dealer, since it is undoubtedly his property; but he will have to guarantee that he will not endeavour to sell it until the expert has given his decision. The judgment of the Tribunal is equitable, showing a regard for the reputation of a famous artist without being oppressive on the picture-dealer.

LONDON does not appear to be a more advantageous market for the vendors of tapestry than for those who wish to dispose of medals and medallions. The two suites by HORATIO ARCHINTO, after the designs of GIULIO ROMANO, which were sold last week at Christie's Rooms, brought prices which would amaze frequenters of the Hôtel Drouot. The first suite represented scenes from the history of SCIPIO AFRICANUS, and the pieces were sold separately as follows:—"Scipio surrounded by his chiefs entertaining his ally King Masinissa at a banquet," 260 guineas; "Scipio having captured Carthage releases the betrothed of Prince Alluccio," 165 guineas; "Scipio conquers the Spanish princes, Mandonius and Indibilis," 195 guineas; "Meeting of Scipio and Hannibal before the battle of the Zama," 215 guineas; "Triumph of Scipio after his defeat of Hannibal," 205 guineas; "Syphax, Prince of Numidia, taken with other prisoners in triumphal procession to Rome," 200 guineas; "Scipio preparing the sacrifices offered to Jupiter after the capture of Carthage," 185 guineas; "Procession of lictors bearing spoils for sacrifice," 165 guineas. The second suite represented the history of TITUS and VESPASIAN, viz.:—"Titus sacrificing to the gods before the expedition to Judea," 190 guineas; "The Apotheosis of Vespasian," 75*l.* 15*s.*; "Triumph of Vespasian and Titus after the taking of Jerusalem," 240 guineas; "Slaughter of the inhabitants of Jerusalem," 100 guineas; "The assault of the walls of Jerusalem by Titus," 126 guineas; "Titus and Vespasian addressing the army," 95 guineas; "Titus granting the request of the suppliant women," 145 guineas; "Vespasian sparing his enemy," 125 guineas. When it is remembered that the pieces were not only valuable as examples of art, but were in a surprisingly perfect condition, it must be allowed that the purchasers were fortunate in obtaining such bargains.

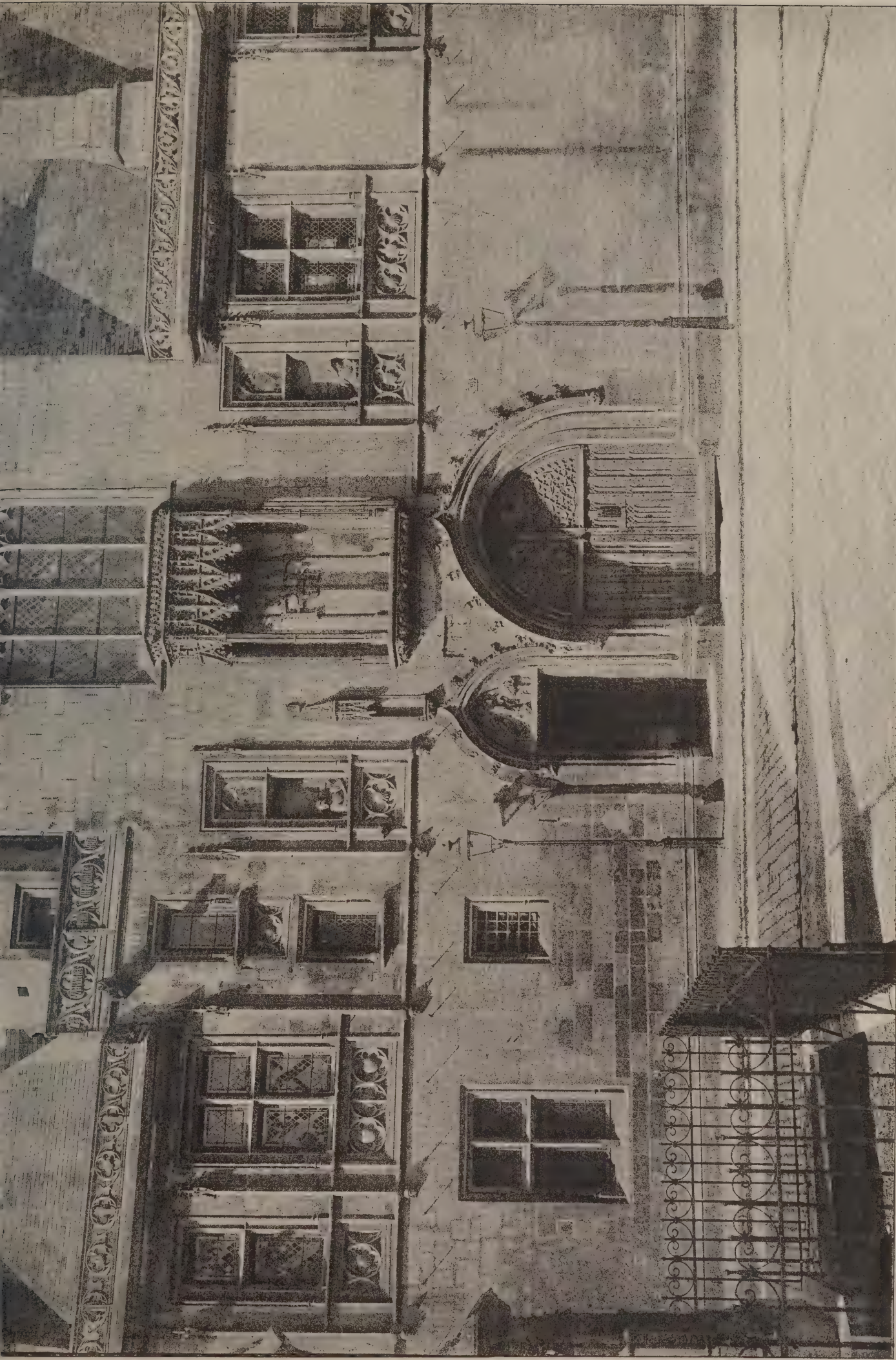
THE construction of Ardrossan Harbour has of late given much employment to Scottish lawyers. A few days ago Messrs. LUCAS & AIRD claimed a balance of 15,958*l.* 17*s.* 8*d.*, balance of account against the company. The defendants pleaded that the original contract with Messrs. LAWSON & WEMYSS which the plaintiffs carried out was 59,211*l.*, and in addition to that sum the company had paid 84,311*l.* It was admitted that any sums paid for the completion of the harbour could be recovered from the first

contractor, Mr. LAWSON, and his security, Mr. WEMYSS. Eventually Messrs. LUCAS & AIRD agreed to accept a sum which was not announced. A couple of days afterwards the law suits between the company and Messrs. LAWSON & WEMYSS were heard. We have more than once stated the grounds for action. In 1887 the contract was entered into, Mr. WEMYSS, unfortunately for himself, becoming security for Mr. LAWSON. Two years afterwards it had to be arranged that the company should take possession of the whole works under the contract, and employ Messrs. LUCAS & AIRD to execute the incomplete works, paying them interest on the contract price and the net cost of completing the works, with 10 per cent. added for general supervision. The company brought an action against the parties to the contract, and they took another against the company. The dispute was referred to Mr. J. WOLFE BARRY as arbitrator. By his award Messrs. LAWSON & WEMYSS were ordered to pay 111,008*l.*, with interest at 4 per cent. and half the costs of the arbitration. The Harbour Company paid their half of the costs, amounting to 4,541*l.* Mr. WEMYSS appealed against the order on the ground that the proceedings took place in spite of his protests. He also maintained that works outside the contract were admitted. At the last hearing of the case the pleas of Mr. WEMYSS were rejected, and he was ordered to pay 111,008*l.*, interest, &c. The case might almost be called an appalling example of the risks of sureties as well as of the difficulty of dealing with harbour works.

WE trust that the differences between the French Government and the ecclesiastics will not cause the cathedrals and churches to fall into ruin. At present the State grudgingly contributes towards the conservation of the buildings, but as by a recent law inquisition is to be made into the sums, however small, received by the clergy as donations, it would cause no surprise if at any time an announcement were made that the clergy must keep up the buildings without State aid. An indication of that course has been observed in Paris. For about eighty years two houses in the Rue Masillon, which are public property, have been used as a sort of barracks for the *employés* of the cathedral of Notre Dame. The occupation came to an end on the 31st ult. The reason was that the Government surveyors demanded the execution of costly reparation in the two houses, and as the cathedral authorities were unable to expend so much money, the houses had to be surrendered. Their aim was to avoid a collision, and any rights which they might possess from so long an occupancy were sacrificed, although the demand for outlay was not warranted by precedent. Supposing, in connection with Notre Dame, similar demands for renewal and restoration were made, what would the ecclesiastical authorities do? The Government are now possessed of powers by which every sou received must be made known, and, as we have said, it may be decided that the whole or the greater part of the money must be expended on the fabric.

IN the American law courts it would appear to make a great difference in the character of a covered space adjoining a house, according as it is called a porch or a piazza. A case exemplifying this fact has been heard in an equity court in Norristown. The plaintiffs, a land company, sold a lot in Abington, near Philadelphia, to one JOHNSON. The conveyance stated that all buildings erected should be not less than 15 feet from the fence or boundary line. A house was built in which the restriction was respected. Afterwards a porch was added. The company considered a porch was a building, and sought for an injunction against its maintenance. The porch probably was what in England would be called a verandah. The Court held that whether a porch or piazza attached to a dwelling is a building or merely a constituent part of one depends upon the manner of its construction. In the case in question the porch was an open one, and was to be regarded as a building within the meaning of the restriction imposed in the conveyance; objection might be maintained to steps or eaves extending beyond the limit of 15 feet. One of the judges assumed that in whatever sense piazza is used it does not convey the meaning of a building. The injunction was therefore not granted.





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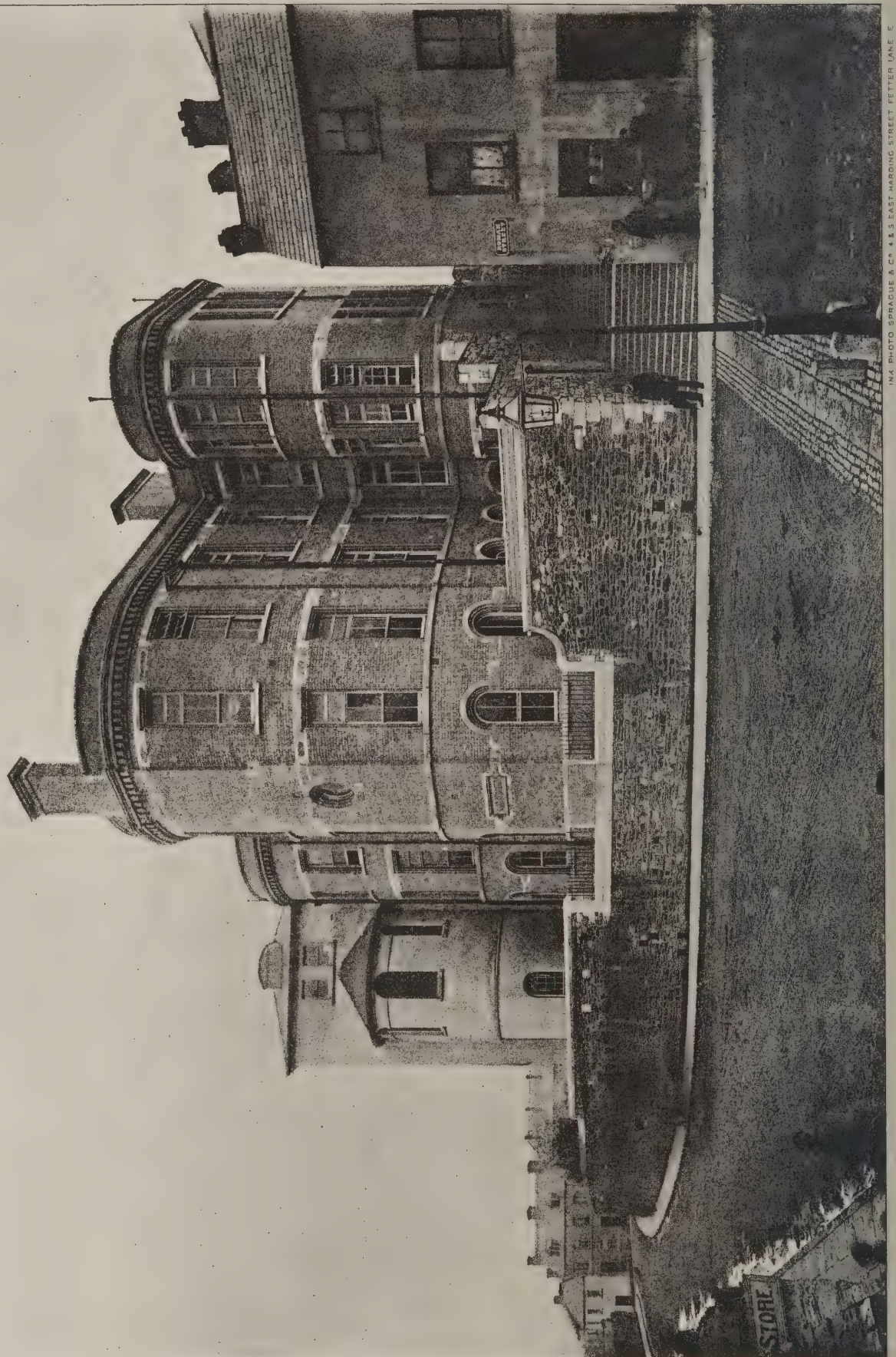
HOUSE OF JACQUES CŒUR, BOURGES.

The Architect, Jan. 19th 1894.



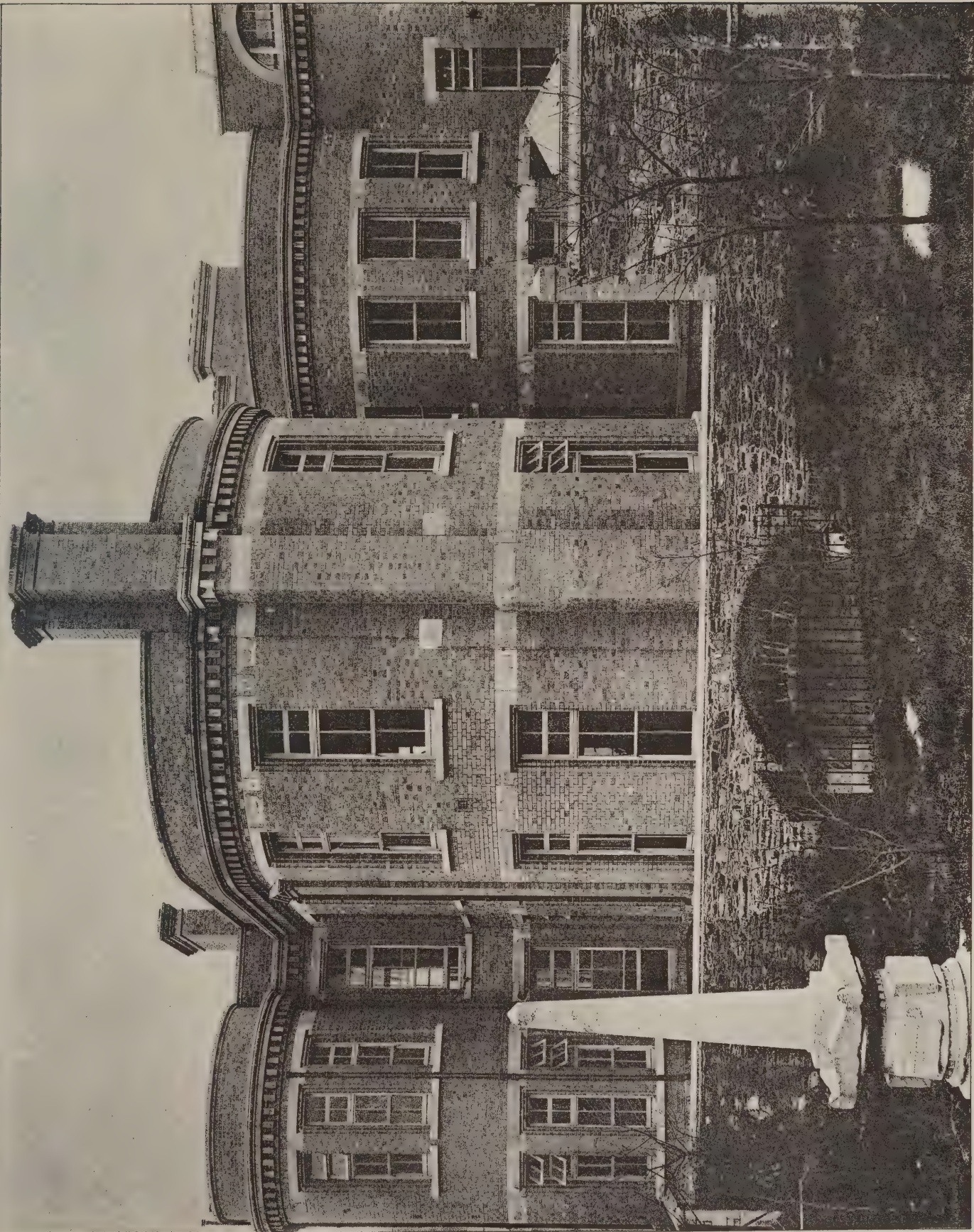
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ARTHUR HILL, B.E., M.R.I.A. Architect.



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NEW WING, NORTH INFIRMARY, CORK.
ARTHUR HILL, B.E., M.R.I.A., Architect.

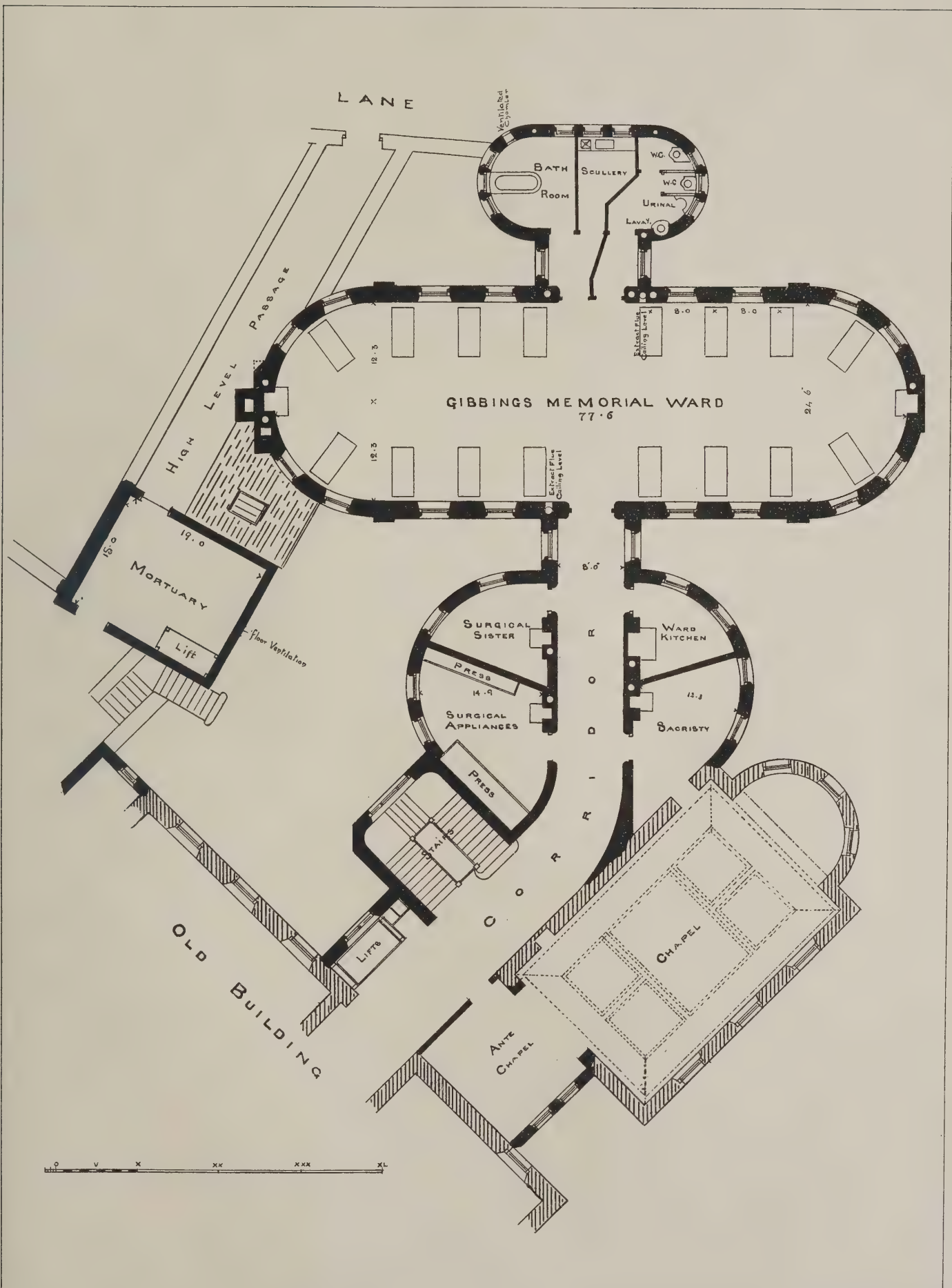


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NEW WING, NORTH INFIRMARY, CORK.
ARTHUR HILL, B.E., M.R.I.A., Architect.

ILLUSTRATIONS.

HOUSE OF JACQUES CŒUR, BOURGES.

THE first building which visitors to Bourges seek is the mansion erected by JACQUES CŒUR. It is now the local Hôtel de Ville. In spite of changes of fashion in styles that building always finds admirers. FERGUSSON describes it as one of the most extensive as well as one of the best specimens of French Domestic architecture, the best among those which are unfortified. Commenced in 1443, it exemplifies a period when the elasticity of Gothic to meet novel demands was accepted as a matter of course. JACQUES CŒUR was a "royal merchant" in more than one sense, for his relations with CHARLES VII. were not unlike those of GEORGE HERIOT with JAMES I. He was loyal and was proud to manifest that feeling. Accordingly, we find the trefoil or fleur-de-lis is utilised for much of the ornamentation. Very ingeniously the tracery in the upper part of the great window of the chapel is made to take that form, and the fleur-de-lis also crowns the roof. The ownership was expressed by the symbols of the scallop, which was identified with St. JAMES, and a heart, that is JACQUES CŒUR. It is also suggested by the motto, which declares that "To a brave heart nothing is impossible."

The house is evidence of an enormous change which occurred in France as well as England. The town walls and ramparts were utilised either as sites for the dwellings of influential persons or to form part of their premises. JACQUES CŒUR was able to secure not only a length of about 200 feet of the wall at Bourges, but in a part which enabled him to employ three of the towers to form the sub-structure of his mansion. They are to be seen in the front to the Place Berry, which is very interesting, although it is considered to be less picturesque than the principal front. The latter, when complete with a group of sculpture under the canopy, must have been fascinating to visitors to Bourges in the fifteenth century, and it was therefore allowable to suppose that some of the women of the house might well be represented as gazing in return at the strangers in the streets.

The contiguity of the two entrances may appear as a puzzle. The explanation is that JACQUES CŒUR wished to give his neighbours the benefit of his private chapel, and made an arrangement by which it could be approached by a newel staircase leading from the smaller door without entering the house. On entering the large court a pile of buildings three and four storeys in height is seen, having three staircase turrets projecting into the court. The front illustrated is, therefore, lower, as there are only two storeys, one of them being arcaded on the court side. Arcades, cloisters or galleries are on the other sides as well, and were intended to shelter the crowds of poor who were everyday fed by the owner of the house.

Apart from architectural interest the house will always insure attention on account of the remarkable history of JACQUES CŒUR. "Put not your faith in princes" was the declaration of STRAFFORD when he found that CHARLES I. had meanly sacrificed him, and both JACQUES CŒUR and JOAN OF ARC could well employ the words to express the return they received from CHARLES VII. of France for all their services. When the peasant girl was to be sacrificed, that king would not condescend to write a line to save her. JACQUES CŒUR was no less devoted to CHARLES VII., for he placed the fortune he had gained in trade at the king's disposal. CHARLES was in a more impecunious condition than our "Merry Monarch" in his continental retreats, for he was glad to receive two fowls and a loin of mutton for his dinner from the merchant. The "King of Bourges" appeared to be no richer than one of the Kings of Brentford when JACQUES CŒUR became his benefactor and protector. With his aid the royal power became a reality, and in return that power was employed for his destruction. We can only briefly notice the story.

JACQUES CŒUR was evidently one of those sages who were able to realise the greatness of commerce in bringing the utmost variety of things under common principles. Unlike most men of that time there was nothing parochial about him. He was as familiar with the East as with Europe. He not only was acquainted with the products of the age, but he realised that the world produced things which could be turned to use with the aid of real know-

ledge. Accordingly, JACQUES CŒUR became the friend and supporter of such followers of science as were then to be met with. The ignorant people of the fifteenth century naturally concluded that he kept alchemists to make him gold, and to prepare poisons whenever it was necessary to get rid of an obstacle to the increase of his wealth.

The death of AGNES SOREL, the king's favourite, was seized as an opportunity for the destruction of a man to whom all the courtiers, as well as the king, were indebted. JACQUES CŒUR was her friend and executor; therefore he poisoned her. The charge depended on a ridiculous conclusion of that sort, and was not followed out; but it was sufficient to warrant the seizure of the merchant prince. Once an innocent man found his way into a French prison there was little difficulty in retaining him. In the case of JACQUES CŒUR it is sufficient to say that "bishops, marshals, knights, chamberlains, secretaries and others of the king's household, down to the servants and lowest attendants, even to house-painters and washerwomen," were among his numerous debtors, and what better way could they devise to gain that little time which is so much desired by all who owe money than by keeping him secure in a dungeon? One charge after another was fabricated. After going through a course of investigation in Taillebourg, the accused was sent to Lusignan, then to Maille, and next to Tours for a repetition of the process. Secular and ecclesiastical authorities disputed for his possession. In those days little could be done without written orders; in fact, life resembled "extras" in a modern building contract. Where were the signed documents without which many of JACQUES CŒUR's actions were treasonable? Says the historian:—"It was necessary to seek in the different towns of Languedoc the orders given by the king for the levy of supplies; receipts, which justified their employment; letters, by which a part of the money was named as destined for his own use; in fine, permissions which he had obtained from the Popes EUGENIUS and NICOLAS V. for the transport of arms to the Saracens. If these permissions were not to be found at Montpellier or at Aiguesmortes, it would be necessary to seek them in the registers at Rome. They were, in fact, not found; good care had, no doubt, been taken that they should not be forthcoming; yet that they existed there could be no question, for copies were afterwards obtained with certificates which prove their authenticity."

It is evident from the procedure that the "law's delay" was as familiar a principle in French castles and dungeons as in the English Chancery. JACQUES CŒUR, like many a brave man in subsequent ages, grew desperate under it. We suppose he belonged to a guild or confraternity, probably was a high officer in one. The Church may also have shown its respect for him by conferring on him "minor orders." On the strength of some privilege he repudiated his judges and claimed as an ecclesiastic to be tried by ecclesiastics. The first effect of his protest was to make his possessors prove their power by subjecting JACQUES CŒUR to the torture. Afterwards he was condemned to death. He was not executed—for there would be no increase of profit obtained in that way. The end that was sought from the beginning was secured by granting him the grace to live in order that he could repent, and by confiscating all his property. His judges and the other agents engaged in conducting the process were allowed to share in the division of the booty. The king, of course, derived most benefit from the transaction.

At such a time it appears almost incredible that one courageous friend could be found who was faithful to JACQUES CŒUR. Like FLAVIUS in "Timon of Athens," his steward JEAN DE VILLAGE was unchanging in his love, duty and zeal. By his efforts JACQUES was allowed to depart from his dungeon, and after a time master and steward made their way to Rome. The reputation of JACQUES CŒUR was not unknown in the Papal Court, and he was soon allowed the opportunities to regain the chief control over the commerce of the world. The value placed on his organising power is evident from his appointment as commander of an expedition against the Turks. He was unable to gain laurels, for he was overcome by the fatigues, and died on reaching Chios. JACQUES CŒUR was in his sixty-first year. CHARLES VII. died about the same time, and his successor LOUIS XI. removed all stains which in law might be attached to the memory of the great merchant.

NEW WING, NORTH INFIRMARY, CORK.

THE addition to this building which we illustrate in the present number has been erected from funds bequeathed by the late Lady COMBERMERE as a memorial to her father, Dr. GIBBINGS, who was for many years connected with the institution.

The difficulty attending the arrangement of the building on the extremely limited site at the disposal of the trustees in such a manner as would not overshadow the old building, and at the same time to maintain perfect lighting and ventilation of the new wards, led to the adoption of rounded ends to all the new portion. The result has been very satisfactory as regards the free access of light and air to every window.

The walls are brick and cement, built hollow, and faced with the South Buckley Company's buff facing brick and Portland stone dressings. In addition to the specially-made curved bricks, three-quarter moulded bricks were also specially made for the window-jamb, to avoid cutting. Credit is due to Messrs. E. & P. O'FLYNN, the builders, for the careful way in which the work has been carried out. The floors are concrete, and iron joists with tongued red pine boarding in the wards, and marble mosaic floors in the other portions. The roof is constructed in a similar way and covered with asphalt, forming a valuable airing-ground for the patients, part of which is under glass. The architect is Mr. ARTHUR HILL, B.E., M.R.I.A.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, when the president, Mr. J. Macvicar Anderson, delivered his annual address to students on

Some Aspects of the Mutual Relationship of Architects.

The PRESIDENT said:—On the first occasion on which it was my privilege to address you, I directed your attention to the consideration of what is probably the most important subject to which an architect can devote his studies, the art of planning; for on the successful development of that art depends the daily comfort, convenience, and therefore to a great extent the happiness, of the community. Hence it is impossible to over-rate the crucial importance of the subject, or to impress it too strongly on the minds of those who, as students, are about to embark on their career as architects. The mistaken idea that such work as planning is not art has led many who should have known better to derogate it to a position of comparatively minor importance. He who regards planning as inartistic or unimportant has no claim to be a true architect. When addressing you last year I offered some suggestions in reference to the varied and extensive responsibilities which you will as architects be called on to discharge to clients, contractors, artists, tradesmen and others. I propose now to confine what will be my final words to you from this chair to one other position which you will occupy—your relationship to the members of your own profession, a relationship second to none in interest, for surely no right-thinking architect can disregard the advantage of possessing the good opinion of his professional brethren in respect alike of his works and of his character.

Master and Pupil.

Let me first touch on the preliminary aspect of this question—the relationship between master and pupil, of which some of you probably have already had experience. Notwithstanding the remarkable expansion of educational facilities in recent years, I suppose the old-fashioned system of pupilage which prevails in this country not only holds its own, but is likely to find increasing favour. In days gone by, when educational facilities—other than those which were to be casually picked up in an office—did not exist, it was perhaps not unnatural that the system of pupilage should be liable to abuse, because the only, or nearly the only, means of acquiring knowledge was from such information as the master might choose to impart. Hence the pupil was to a large extent, if not solely, dependent on the master, and in such circumstances a niggard spirit of exaction on either side would surely conduce to a relationship the reverse of satisfactory. In these later days this is not likely to occur, for the pupil is not now solely dependent on his master for the acquisition of knowledge. The air is full of educational courses, curricula, syllabi, lectures and classes, and the remarkable success which many of these have attained demonstrates how much they were needed. The creation and continuing elaboration of such educational facilities has materially altered the relations which formerly existed between master and pupil. It is true that students must to some extent take advantage of such facilities after office hours;

but I think that, in receiving a pupil and accepting a premium with him, a master is now bound, not merely to extend to him the advantages of training in his office, but, in addition, to recognise the existence of educational institutions outside, and to afford to his pupils reasonable facilities for profiting by them. And if this be so, what is the corresponding claim on the pupil? Obviously that, in enjoying the privilege of opportunities of study apart from the office, he is bound to devote himself with all the keener application to the work of the office while in it. No office can be properly conducted without discipline. Regularity, application, system are indispensable. If, in an enlightened and liberal spirit, hours are set apart in which pupils can engage in outside study, they should be rigidly and loyally adhered to. To fail in this is not merely loss to the individual, but injury to others, for the force of example is great, and no one can release himself, even thus early in life, from exercising influence on others—it may be for good, it may be for evil, but it must be for one or other.

One valuable branch of study outside the office, for engaging in which a master should always be glad to afford his pupils facilities, is that of sketching and measuring old buildings. To any one possessing the gift of artistic draughtsmanship this is an enchanting occupation, although not free from a seductive, and even dangerous, tendency. To make pretty sketches, however fascinating, is not the object in view. Far be it from me to detract from the charm of artistic sketches, but what I insist on is that in sketches of old work the primary requirements are accuracy and clearness, lines well defined, forms and proportions true, joints and construction expressed, and dimensions clearly figured. Such sketches should be finished on the spot, and should not be touched up afterwards. By such subsequent treatment they may lose some of their charm, and must lose much of their value, for if not finished at the time they cannot be guaranteed as accurate delineations. That this subject is rightly regarded as of great importance is illustrated by the prizes offered here and elsewhere for measured drawings and sketches; and while, as I have said, masters should always afford facilities, pupils should never lose opportunities for engaging in it. The eye as well as the hand is thus trained to accuracy, and the mind is stored with useful knowledge. In view of the value attaching to work of this nature, I have thought that it would not be uninteresting or unprofitable to direct your attention to the measured sketches of an old master in architecture and his pupils, one whose memory—though he has long since passed away—still lives, and is likely to survive the changing fashions of succeeding eras. Palladio, as you all know, lived in the sixteenth century, having been born in 1518, and having died in 1580. The sketches exhibited, as illustrative of the manner of such work at the period referred to, form part of the Burlington-Devonshire collection, which, through the munificence of our honorary Fellow, the present Duke of Devonshire, have now become, under certain conditions, the property of the Royal Institute of British Architects. They are interesting as illustrating the actual manner of work of an eminent architect of the sixteenth century and his assistants, a period when architectural students did not glory in the manifold advantages which they enjoy in the present day. It is to be noted, too, that, apart from the character of the draughtsmanship, these sketches amply fulfilled their proper purpose, inasmuch as complete drawings of the buildings they represent—the Baths of Agrippa and of Caracalla—were afterwards made from them, and published in the great Earl of Burlington's book,* which you will find in the library. In further illustration of the manner of work of such masters, a selection from the drawings of the followers of the Palladian school in our own country—Inigo Jones, John Webb, and others in the seventeenth century, and of William Kent in the eighteenth—some of which are signed, is also exhibited; and in respect both of draughtsmanship and design, they may, in my humble judgment, be profitably studied by students, and, I venture to add, even by the architects of this privileged age.

Architectural Competitions.

Passing from such early relationship of master and pupil to more mature experience, many of you will, no doubt, find yourselves occupying the position of friendly rivals in architectural competitions. The general question of whether the system of competition is advantageous or prejudicial to the interests of architecture need not now be discussed. I have more than once recorded an opinion unfavourable to the system, and I see no reason to alter it. I fear, however, that whether we like the competitive system or not, we must accept it as an established fact, and as practical men, therefore, our efforts should be directed to mitigating its evils, as I should say—or emphasising its advantages, as others may think. There can be no doubt that much has already been accomplished in this direction by the Royal Institute. I have observed that the paper of "Sug-

* *Fabbriche Antiche disegnate da Andrea Palladio Vicentino e date in luce da Riccardo Conte di Burlington. Fo. Lond. 1730.*

gestions for the Conduct of Architectural Competitions," which we publish, is very generally referred to and adopted by promoters of competitions throughout the country, and I cannot but recognise that—in spite of occasional enormities—there is now a more general desire to treat architects well than was formerly the case. In my experience as assessor, I have happily succeeded, in more than one instance, in prevailing on promoters to recast conditions which had already been drawn up although not issued, in such a way as to expunge all objectionable features and to make them perfectly fair and satisfactory. It is gratifying to be able to record the growth of such a spirit of equity and liberality on the part of promoters as has rendered this possible. In some cases, however, conditions are drawn and issued before the assessor is consulted, as, for example, in the recent competition for the extension of the Pump Room at Bath. When this is the case, all the assessor can do is to select the best designs in conformity with the conditions, apart from the question of their excellence or otherwise. I confidently assert that in every such instance which has come under my own cognisance, the promoters have suffered from not having called in a professional expert to advise them from the outset.

The question whether promoters should be bound to adopt the award of their assessor is one which admits of a good deal of discussion. It is argued on one side that it is only human nature for those who are going to spend money on the proposed building to reserve to themselves the right of ultimate selection, while, on the other hand, it is asked, What is the use of taking professional advice unless it is adopted? In regard to the first, it should be borne in mind that in almost every competition the promoters do not spend their own money, but that of rate-payers or subscribers, and that they consequently are only agents between the capitalist and the profession, while in regard to the other view it does not seem to me to be a *sequitur*, however desirable, that because you call in professional advice you are bound to act on it. I confess, however, that my sympathies are all in favour of unreserved powers being conferred on the assessor. If it is desirable to secure expert skill in the preparation of the competitive designs, is it not equally so in regard to their selection? At all events, I am satisfied that an assessor, when consulted as to the conditions, should allow no mistaken feeling of delicacy to deter him from securing, if possible, the ultimate decision for himself, on the ground that nothing will tend more to inspire confidence in competitors than the insertion of such a condition. He cannot, of course, insist on this, but if he exercises ordinary tact I am convinced that in nine cases out of ten he will succeed. Such has been my own experience, for in more than one case I have obtained this concession contrary to the expressed desire of promoters. Whatever may be thought, however, as to the respective rights of promoters and assessors in this respect, there can be no manner of doubt that the interests of architecture are best promoted when the final decision is left unrestrictedly in the hands of the professional assessor. An apt illustration of this is the recent Pump Room competition at Bath, already referred to. The promoters reserved to themselves the ultimate selection, and in the exercise of this right adopted the design which Mr. Waterhouse had placed second in preference to the design to which he awarded the first premium. In view of the sequel, how infinitely better would it have been for themselves and all concerned had they adopted the award of Mr. Waterhouse? I did what I could to press this view upon them, but ineffectually. A unique feature in this competition—and one which I trust may remain so—was the circumstance that the competitor who was placed second by Mr. Waterhouse, and whom the promoters determined to place first, turned out to be an official of their own who had himself drawn up the conditions. One can scarcely conceive a greater act of impropriety, or one more absolutely unfair to other competitors, and yet a proposition was actually made to the effect that a second competition should be instituted between the three competitors selected by Mr. Waterhouse, one of whom was the official in question. My advice was sought in regard to this proposition before it was brought forward, and it was given unhesitatingly to the effect that there was only one course to pursue, namely, to adopt Mr. Waterhouse's award in respect of the design he placed first, to disqualify the second, to give the second place to the design he placed third, and to ask him to select a design to take the place of the latter; further, that in any circumstances the offence of the official in question was so grave that he should be absolutely precluded from having any further connection with the matter.

Another illustration of the advantage of the decision of the assessor being final occurred recently. The conditions had been issued and the designs received before I was consulted. While leaving my judgment free—for otherwise I would not, of course, have accepted the appointment—the promoters requested me to consider the designs in a recommended order of merit. It so happened that as regards such order the first had to be last, and the last first, or nearly so, for the design which was far and away the best in every respect, and which I

accordingly placed first, was last but one, and the one which beyond comparison was the least meritorious occupied the first place in the suggested order of merit. It is satisfactory, however, to add that the promoters appreciated the reasons which I put before them for my selection, and at once adopted my award.

The relation which competitors bear to one another is, or should be, so simple and clear as not to require definition, and yet a recent instance demonstrates that this is not necessarily the case. We expect, and rightly expect, fair dealing on the part of promoters; and they and we have the same right—neither more nor less—to expect fair dealing on the part of competitors. The unmistakable course for competitors to follow is to comply strictly with the spirit and the letter of the instructions. When conditions are properly drawn, there should be neither doubt nor difficulty in doing so. Such obvious procedure was singularly disregarded in the case of a competition held not many months since. The conditions were evidently drawn with the intention of precluding any chance of the identity of competitors being disclosed, and yet I regret to state that an architect, who at the time was a member of one of our allied societies and an Associate of the Institute, did not scruple to contravene the conditions by disclosing his identity—not, it is true, by signing his drawings, which would have been manly, though perhaps quixotic in view of the conditions—but by means which we could not but condemn, and which were indignantly disowned by his provincial brethren. I need scarcely add that the architect in question is no longer an Associate of the Institute nor a member of the allied society: so far, well; but the pity is that the credit of the profession should have been even temporarily tarnished by such conduct on the part of one of its members.

Criticism.

Those of you who possess literary ability may sometimes find yourselves placed in positions of delicacy and difficulty in relation to your professional brethren. A facile pen is an acquisition greatly to be desired when guided by truth, knowledge and charity; it becomes a dangerous power when influenced by prejudice, envy, or ambition. Nothing is more easy for one possessing this power than to write sharp philippics which will insure an approving laugh from the unthinking—but what of the keen wound they may inflict on some sensitive nature? Nothing is so easy as to write disparaging criticisms—for the discovery of real merit calls for study—but what if they are wide of the mark and suggest misleading conclusions? No one should venture to criticise the work of others without first honestly trying to place himself in the position of the author of the work criticised, and to realise the difficulties he had to contend with. Viewed from a general standpoint, a work may be severely censured, which, regarded in the light of the circumstances in which it was conceived, may rightly be accepted as a triumph. This is specially true as regards architectural criticism. How often do our critics and reviewers strive to realise and to make allowance for the difficulties and the hindrances which surrounded the inception or the execution of the work criticised? How often do such considerations influence the pens of ready writers? Alas! for the rarity of Christian charity. It is to be feared that the literary reputation of the critic is too often the influencing motive, regardless of the feelings of the author, and of the difficulties he had to contend with. Be assured your criticism of the work of others will be none the less pungent, and will be all the more appreciated if your pen is divorced from prejudice and thoughtlessness, and inspired by truth and knowledge, seasoned with brotherly kindness.

Witnesses.

You may be called on to aid by your testimony as experts in influencing judgment for or against your contemporaries. It has ever been—and I suppose it ever will be—the case that men will differ. Even the highest code of morality anticipated this in the qualified injunction, "If it be possible, as much as lieth in you, live peaceably with all men." No doubt there are some to whom the injunction does not apply, inasmuch as to live at peace with anyone seems to be with them a sheer impossibility; but even with those who are peaceably disposed, circumstances will occasionally arise involving a principle which they cannot concede, and which render it necessary to appeal to the help of others either in law or arbitration. I cannot claim to speak on this subject as an expert, my appearance in courts of law having happily—although unfortunately, too—been restricted to the discharge of the wearisome duties of a jurymen; but it has sometimes vexed me to hear some of my professional brethren, whom I knew to be men of probity, censured by others for appearing as witnesses and giving testimony against them. Such experiences, which are by no means restricted to the profession of architects, may be thought to be unedifying, and I confess that I regard the relationship as perhaps the least desirable and the most inartistic which an architect can occupy; but yet I fail to see why the witness should be the subject of censure more than he against whom he

testifieth. Is it not the fact that the last-named is frequently the original sinner? How can light be thrown on a purely technical point other than by the evidence of experts? and how can such evidence be obtained if none will appear as witnesses? How can questionable or derogatory proceedings be exposed if reputable men will not come forward to testify against them? Further, why should it be thought strange that men of the same craft should differ in the witness-box, so long as it is a patent fact that in scarcely any topic of ordinary conversation in society will the same view be taken? In this relationship the rule of guidance appears to me to be clear and simple. Do not consent to give evidence as to the works or character of a brother architect unless you are perfectly sure that you can testify from the safe basis of experience, and in the honest belief that what you testify is truth.

Etiquette.

No dissertation on the relationship in which professional men stand to each other would be complete without some reference to the subject of professional etiquette. We have heard etiquette condemned. We have been told of the triumph of prejudice and jealousy to the detriment of the welfare of client or patient. We have even heard whispers of the neglect of patients rather than the consultation with the rival practitioner which might have saved life. Such rumours—if, indeed, they are true—are at best but exaggerated indications of exceptions which prove the rule. Etiquette gives honour where honour is due; it rightly exposes impostors. Etiquette appreciates ability and encourages merit; it scathingly condemns the individual and the society that live on borrowed plumes, assuming virtue if they have it not. Etiquette generously extends the arm of sympathy; it would rather cut off the right hand than by word or deed injure others for the sake of personal aggrandisement. Etiquette recognises all honourable methods of advancement; it rightly looks askance at questionable expedients of self-advertisement, such as are too frequently resorted to. In a word, etiquette is the standard which unerringly gauges the reputation of professional men. Above the level of the gauge is to be found all that is honourable and commendable; beneath it all that is grovelling and unworthy. In the Harveian oration delivered at the Royal College of Physicians last October by Dr. Pye Smith, this subject was so happily delineated that I cannot refrain from quoting the words of the Harveian orator:—"Professional etiquette really means the observance of those rules which distinguish a profession from a trade, which make our calling honourable as well as honest, which check the arts of advertisement and direct our ambition to obtaining the suffrages—not of the public which cannot—but of our profession which can—judge truly, rules of conduct which are, in fact, nothing but the carrying into daily practice of the golden rule, to do to others as we would they should do to us."

Sir Frederick Leighton's Addresses.

Although my subject is the relationship that exists between members of our own profession, I must before closing crave your indulgence while for one moment I stray beyond it, for the purpose of directing your particular attention as students of architecture to the very remarkable addresses on the arts, and more especially the architecture, of different countries, which have been recently delivered by one who is not a member of our profession. For many years we have been accustomed to regard Sir Frederick Leighton as a man of great parts and exceptional culture. To refer to his works as a painter would be superfluous; his claim to be a sculptor of no mean order is indisputable; and as if this were not sufficient, the subject of his more recent addresses to the students of the Royal Academy has led him, as it were inadvertently, to demonstrate that in regard to the art of architecture he possesses an intelligent and a critical grasp of the subject second to no modern author. To few indeed is it given to combine with wide historical research and keen critical acumen the indescribable literary charm of composing poetry in prose. Let me commend to your thoughtful attention the study of these singularly learned and graceful discourses.

In now uttering my parting words to you from this chair, let me wish you God-speed in the elevating career on which you are entering, a career which is the unique embodiment of the ideal and the useful. In the pursuit of it you will not, it is true, be enfranchised from those hindrances, anxieties and worries which are incidental to all human engagements; nor will you have as your goal the accumulation of wealth, which so many regard as the chief end of man, though it is far, very far, from being so in truth; but, if inspired by a generous spirit of devotion, such as should ever be the characteristic of the student of art, you will not fail to find in it as much pure enjoyment and as much ennobling aspiration as you are likely to attain in any avocation in which you could engage.

[Mr. A. Graham's paper on the prize works will appear next week.]

THE ILLUSTRATION OF BOOKS.*

CONSIDERING the small amount of interest which the author—whether historian, poet, essayist, man of science or discoverer—seems to take in the production of his book, and the personal interest with which he might endow it, let me draw a picture of the average author of to-day—or yesterday; the "man of letters," the student, who lives apart from the whirl of journalism and hand-to-mouth literature. The picture may be a little fanciful, but it is intended to be suggestive, not only to the author, but to all who are engaged in the production of books, whether "olde style" or otherwise.

If there be one characteristic which should enhance the interest attaching to the expression of a writer's thoughts, it should be that his individuality, or personality so to speak, should be in some way expressed on the printed page. Chaucer, Shakespeare, Milton, Scott, Byron, Dr. Johnson, and the men of letters of the past are, each of them, deeply interesting to us in their personality, in their costume, in their handwriting, and in whatever they have left behind them as the work of their own hands. As matters stand at present, the high pressure of work imposed upon anyone who has something to say is turning the picturesque figure of the "author" (as we read of him in past times) into a more or less highly-strung, pre-occupied, steam-driven "literary machine."

Looking backward to the Victorian age (say from the end of the twentieth century), what pictures will be formed in the minds of those who come after us of the *entourage* of the man of letters of to-day? Clothed in a degrading, characterless costume, which takes all appearance of manliness and suppleness from his figure, living in houses and in cities in which nearly everything ornate or beautiful has been stolen, borrowed or copied from another country or period, he is found engaged in the production of books in which, as far as the mechanical parts are concerned, nearly everything is a sham.

The nineteenth-century author's love for the literature of his past has led him to imitate not only the style, but the outward aspect of old books; and, by a series of frauds (to which his publisher seems to have lent himself only too readily), to produce something which appears to be what it is not.

The genuine outcome of Mediæval thought and style—of patience and leisure—is treated at the end of the nineteenth century as a fashion to be imitated in books, such as are to be seen under glass cases in the British Museum. The twentieth-century reader, looking back, will see few traces worth preserving, either of originality or of individuality.

The typefounder of to-day takes down a Venetian writing master's copy-book of the sixteenth century, and imitating exactly the thick downward strokes of the reed pen, forms a set of movable type, called in printer's language "old face," a style of letter much in vogue in 1893; but the style and character of which belongs altogether to the past. Thus, with such aids, the man of letters of to-day—living in a whirl of movement and discovery—clothes himself in the handwriting of the Venetian scholar as deliberately as the Norwegian disguises himself in a bear skin.

The next step is to present in his book a series of so called "engravings," which are not engravings. The advance of science in producing blocks from photographs of steel and other intaglio plates, for the type printing-press, at a small cost per square inch, is not only taking from the artistic value of the modern *édition de luxe*, but also from its personal interest and genuineness.

The next step is to manufacture rough-edged, coarse-textured paper, purporting to be carefully "hand-made." The rough edge, which was a necessity when every sheet of paper was finished by hand labour, is now imitated successfully by machinery, and is handled lovingly by the book-worm of to-day, regardless of the fact that these roughened sheets can be bought by the pound in Drury Lane. The worst and last fraud (I can call it no less) that can be referred to now is, that the clothing—the "skin of vellum"—that appropriately encloses our modern *édition de luxe* is made from pulp, rags and other *débris*. That the gold illuminations on the cover are no longer real gold, and that the handsomely bound book, with its fair margins, cracks in half with a "bang," when first opened, are other matters connected with the discoveries of science and the substitution of machinery for hand-labour, which we owe to modern enterprise and invention.

But, if it be impossible in these days (and in spite of the efforts of Mr. W. Morris and others it seems to be impossible) to produce a genuine book in all its details, it is worth considering in what way the author can stamp it with his own individuality; also to what extent he is justified in making use of modern appliances.

How far, then, may the author be said to be responsible for the state of things just quoted? Theoretically, he is the man of taste and culture *par excellence*; he is, or should be in most

* From the Cantor lecture, by Mr. H. Blackburn, delivered at the Society of Arts.

Cases, the arbiter, the dictator to his publisher, the chooser of style. The book is his, and it is his business to decide in what form his ideas should become concrete; the publisher aiding his judgment with experience, governing the finance and carrying out details. How comes it then that, with the present facilities for reproducing anything that the hand can put upon paper, the latter-day nineteenth-century author is so much in the hands of others as to the appearance of his book? It is because the so-called educated man has not been taught to use his hands as the missal-writers and authors of Mediaeval times taught themselves to use theirs. The modern author who is, say, fifty years old, was born in an age of "advanced civilisation," when the only method of expression for the young was one—"pothooks and hangers." The child of ten years old, whose eye was mentally forming pictures, taking in unconsciously the facts of perspective and the like, had a pencil tied with string to his two first fingers until he had mastered the ups and downs, crosses and dashes of modern handwriting, which has been accepted by the great as well as the little ones of the earth as the best medium of communication between intelligent beings; and so, regardless of style, character or picturesqueness, he scribbles away. So much for our generally straggling style of penmanship. Looking at the handwriting of to-day, what wonder that a writer of any taste or feeling should hesitate to distribute his deformities through the world by means of facsimile reproductions, and yet we desire to see the handwriting of our favourite author. But handwriting in our generation is so singularly mean and inexpressive, it has arrived at such a point of indistinctness and slovenliness amongst men, that (it is sad to say it) refuge is now taken in the American type-writing machine.

But we are told that we are shaking off our trammels, and that all these modern inventions are to set the spirit free; and so, to shorten our journeys on the road to knowledge, we are to have recourse to the "typewriter" and its most monotonous lines. Should we not rather reform our own handwriting once for all? First study a system of shorthand for rapid notes, and then learn to write so clearly and distinctly that a facsimile of it would be a delight to read on the printed page.

Consider the question in all its bearings. The time has come when, for the first time in the history of the world, any lines drawn or written can be reproduced in facsimile, from which thousands of copies can be printed. There is no occasion to repeat the details; once realise the fact that your handwork can be made to appear clearly on the printed page (with little more expense than type-setting), and you—the young author, student, man of letters—will give us in the future more of your interesting personality. The thoughts may flow as before, but the vessel to receive them and convey them to others shall have its hall-mark of individuality.

Thus in the future the distinction will be more clearly drawn between the work of the student on the one hand, and journalism, hack literature and "penny dreadfuls" on the other. Type-setting and uniform printing of words by the thousand will be used as before, but the "author"—for want of a better word—the poet, and the scholar, who gives a book to the world, should free himself (as much as possible) from mechanical trammels, and boldly set to work to present himself in appropriate guise. The beautiful photographic processes which have been perfected during the last few years will facsimile a page so accurately, that it is wonderful that so few of our artistic countrymen have availed themselves of them. Had such processes as those now in use in England, France and Germany been in existence in the time of the early engravers, there would probably have been no such thing as wood-engraving, for the chroniclers and artists, from the engraver of St. Christopher to Bewick, would have hailed the new methods with delight. What we might have lost or gained artistically cannot be considered now. The question for the moment is how to rouse sufficient interest in these matters amongst authors.

Let us take the poets first. They have comparatively little to do with the outer world; but the public, rightly or wrongly, is eager to know more of their personality. They, the elder, the professional poets, live, most of them, in an atmosphere of cloistered silence, of repose and picturesqueness, more akin to Mediaeval times than to railways and telegraphs. They come out to greet us in a garden of flowers, where nature forms herself into pictures all around. Is it not a poor thing that they can record little or nothing of their surroundings pictorially—no mental impressions except in type-set words? With the exception of the late Lord Tennyson, it is difficult to think of any poet of our day whose personality is well known and cared for by the public. Modern dress, and the fear of appearing to "pose" in these advertising days, has led to the neglect of many outward things which the historian would hold dear.

The moral may well be drawn. Equip yourself in more ways than one for expression by the pen; to you who write, in times when it is impossible to be personally picturesque, remember that anything drawn or written by your own hand

may be of interest in the future. These are things that the artist, as well as the author, may bear in mind, as in the future they will work much more in concert and consider together the setting-out of a page, the harmony of text and illustrations and appropriate ornament on page and binding.

Is the "setting-out of a page" one of the lost arts, like the designing of a coin? What harmony of style do we ever see in an ordinary book? How many authors or illustrators of books show that they care for the "look" of a printed page? The fact is that the modern author shirks his responsibilities, following the practice of the greatest writers of our day. There are so many "facilities"—as they are called—for producing books that the author takes little interest in the matter. Mr. Ruskin, delicate draughtsman as he is known to be, has contributed little to the *ensemble* or appearance of the pages that flow from the printing-press of Mr. Allen, at Orpington. How well his books are printed you can see presently, but judged by the past a deadly monotony pervades the page; the master's noblest thoughts are printed exactly like his weakest, and are all drawn out in line together as in the making of macaroni. Mr. Hamerton, artist as well as author, is content to describe the beauty of forest, trees, ferns and flowers, the variety of underwood and the like (nearly every word, in an article in the *Portfolio*, referring to some picturesque form or graceful line), without indicating the varieties pictorially on the printed page. Tennyson and other poets have been content for years to sell their song by the line, little heeding, apparently, in what guise it was given to the world; and so the monotony of uniformity pervades the pages alike of great and small, and a letter from a friend is now often printed by a machine. The last stage of feebleness and admission of incompetence in the matter of using our hands which I may touch upon here seems to have been reached in the indiscriminate use of the typewriter, for which, as a satirical writer lately remarked, "There is something to be said, as many of our scientific friends have been able to communicate their ideas in a letter for the first time by this means."

Let us now look at some slides in illustration of what I have called the "decorative page," with and without pictorial illustrations.

1. Example of early Venetian writing from a copy-book of the fifteenth century written with a reed pen. See the clearness of the page and its picturesqueness; also its similarity to the type letters used to-day—what are called "old face"—the origin of what is known as Caslon type and of much (good and bad) letter in modern books.

2. A beautiful example of Gothic writing and ornament from a French illuminated manuscript in the British Museum, date 1480. Here the decorative character and general balance of the page is delightful to modern eyes.

3. Facsimile of a printed page from Polydore Vergil's "History of England," produced in Basle in 1556. The style of type is again familiar to us in books published in 1893, but the setting out of the page, the treatment of ornament (with little figures introduced, but subservient to the general effect), is not familiar, because few of us can produce a decorative page. The printer of the past had a sense of beauty and of the fitness of things apparently denied to all but a few to-day.

4. An illuminated printed page, 1521, with engraved borders, after designs by Holbein; figures again subordinate to the general effect.

5. Example of a page—Italian, fourteenth century—ornament, initial and letters forming a brilliant and harmonious combination.

In all these pages, it will be observed, what is called "colour" in black and white is preserved throughout. Closely criticised, some of these block designs may appear crude and capable of more skilful treatment; but our object is to study the effect of a page without "illustrations" in the modern sense of the word—to see how colour and breadth is obtained in pure line. In these and similar pages, such, for instance, as "Le Mer des Histoires," produced in Paris by Pierre la Rouge in 1488, the harmony of line-drawing with the type letters is most interesting and instructive at the present time. It may be attained in line but never in wash-drawings reproduced by the processes.

It is in the production of the decorative page that wood-engraving asserts its supremacy still, as may be seen in some beautiful books produced in England during the past year, which we will examine after the lecture. Mr. William Morris's books, which he has kindly lent us—where artist, wood-engraver, type-founder, papermaker, printer and bookbinder work under the guiding spirit (when not the actual handwork) of the author—have been fully described elsewhere. They are interesting to us rather as exotics: an attempt to reproduce the exact work of the past under modern conditions—conditions which render the price within reach only of a few. But they are at least a protest against the modern shams of which I have spoken to-night.

From an economical and practical point of view, and as a

new departure in modern illustration, I would rather point to the work produced by an art school, where an educated and intelligent mind seems to have been the presiding genius; where the illustrators, whilst they are fully imbued with the spirit of the past, have taken pains to adapt their methods to modern requirements. I refer to the Birmingham Municipal School of Art. Whilst using wood-engraving freely, the illustrators of Birmingham, notably Mr. Gaskin, have shown, as in the page before you, what can be done in line-drawing by the relief processes to produce colour and ornament which harmonise well with the letterpress of a book. This seems an important step in the right direction, and if the work emanating from this school were less apparently confined to an archaic style, to heavy outline and Mediaeval ornament (I speak from what I see, not knowing the school personally), there are possibilities for an extended popularity for those who have worked under its influence.

In conclusion, then, let me say that every one who cultivates a taste for artistic beauty in books, be he author, artist or artificer, may do something towards relieving the monotony and confusion in style which pervades the outward aspect of so many books. It is a far cry from the work of the missal writer in a monastery to the pages of a modern book, but the taste and feeling which were shown in the fifteenth and sixteenth centuries in the production of books exist in the nineteenth (as we know), but under the difficult conditions of our times.

In the book of the future we hope to see less of the "lath and plaster" style of illustration, as produced from careless wash-drawings by process; fewer of the blots upon the page which the modern reader seems to take as a matter of course. In books, as in periodicals, the illustrator will have to divest himself, as far as possible, of that tendency to scratchiness and exaggeration that injures so many process illustrations, as pointed out in the first lecture. In short, he must be more careful and give more thought to the meaning of his lines, to the adequate expression of textures and the like. There is no reason why the texture of a man's coat should look like straw, or the background to a figure have the appearance of fireworks. No amount of ability on the part of the artist will make these things tolerable in the near future.

In "the book of the future" the author may do more than he has ever done, as I have already suggested; a volume of instances might be given where a writer's meaning could be more clearly expressed pictorially than verbally. The subject is not half ventilated yet, nor can I touch upon it further tonight; the day is not far distant when the power of the hand of the author will be tested to the utmost and lines of all kinds will appear in the text. There is really no limit to what may be done with modern appliances, if only the idea is seized with intelligence; the journalist of the future will also aid unconsciously in the formation of a new language which every nation can understand.

INSTRUCTION IN ARCHITECTURE.

THE first of a series of twenty lectures on the history of architecture was delivered on Saturday, at the Queen's College, Cork, by Mr. Arthur Hill, B.E., M.R.I.A., architect. The lecturer said:—Before entering on the immediate subject of these lectures I would like to say a few words respecting the present educational requirements of the architectural profession. The only lectures available for architectural students in the Metropolis, and as far as I know in the kingdom, until recently, were those given by Professor Hayter Lewis, on "The History of Architecture" and on "Building Construction," at London University College, and a somewhat similar course at King's College. To those who desired to enter the profession at that time there was practically no other means of obtaining a knowledge of architecture but to enter an architect's office. As it seldom happened that the principal had sufficient leisure to become a tutor, the training of the youth entirely depended on his own capacity to pick up and digest the various fragments of professional practice that happened to come before him in the ordinary routine of office work. There was nothing whatever to compare with the well-organised scientific education afforded young engineers here in Cork, and in most of the other universities in the country where an insight is given of the principles that underlie a profession before being introduced to the vortex of its practice. In a paper read before the Conference of Architects held in 1874 I had an opportunity of advocating the claims of architecture to be put on the same level, regarding educational facilities, as engineering, and suggesting the addition of an architectural department to the several engineering schools already existing in the country. At another conference held in 1887, where the question of education occupied somewhat a more important part, I again put forward the same plea. Since then the scene has changed considerably.

A few years ago the Royal Institute of British Architects adopted an examination scheme which was at first on a volun-

tary basis, but now the system is in full force, and virtually closes the doors of the Institute against all but those who succeed in passing a fairly extensive educational test consisting of a preliminary, intermediate and final examination. The preliminary examination is equivalent to an ordinary matriculation to test general education. The intermediate examination requires (1) A knowledge of the history of architecture, the various styles and their characteristic mouldings and ornaments. (2) Building construction, the nature of materials and calculation of strengths. (3) Elementary physics. (4) Land surveying and levelling. (5) Geometry and perspective. The examination extends over two days. The final examination requires seven days. Two days are given to making a design for a building before the examiners, and the remaining five days are devoted to oral and written examination in (1) the history of architecture, and (2) construction of a higher grade than what was expected of a probationer, besides (3) hygiene, drainage, water-supply, ventilation, &c., (4) professional practice, specifications and estimating.

Such training as will enable young men to pass this examination is, therefore, at the present time a necessity which has made itself felt throughout England, and in many places efforts are being made to help those whose road to a professional career lies through the gate of examination. Besides the lectures given at King's College and University College, London, the Architectural Association, originally established as a junior society with classes for the mutual improvement of its members, has converted itself into what is little short of a college of architecture—a very bold step for a private society to take, and one that deserves to succeed. The classes are divided into "lectures" and "studio work," and extend over a four years' course. In the provinces there are already several localities where specially organised courses of instruction for architectural students have been arranged:—Manchester Technical College, Glasgow Technical College, and also at the Glasgow School of Art, Durham College of Science, Bristol University College, Birmingham School of Art, also in Sheffield, Nottingham and Leicester, and as far north as Dundee the local art and technical schools are used for the purpose. In Liverpool and Leeds, thanks to grants made by the local authorities, lectures of great value are now being given in these subjects.

In considering the suitable education for an architect, it should not be forgotten that architecture is both a science and an art, and that the concurrent development of both these departments is essential. A constructor who is not an artist, or an artist who cannot build, are neither worthy of being called architects. To any local student who may wish to know the best way to prepare for a professional career, I should say, in the first place, complete your engineering course here, as in the direction of scientific training there is nothing better to be had, and for the development of your artistic faculties attend the school of art, study drawing in every department, shading, colouring and modelling, working from the antique and from the life.

The course of lectures upon the "History of Architecture" about to be inaugurated here is designed to give some idea of the great works of preceding ages, their construction and decoration, and the various transformations that occurred from time to time as nations rose and fell. It by no means embraces all that goes to make a complete school of architecture and is but a step in that direction. Of course a properly directed study of ancient buildings does not provide us with a sort of "ready-made department" by means of which any figure can be promptly clothed in any desired fashion. But to know something of the way in which our predecessors built, how their different needs were satisfied and the uses they made of various structural combinations and decorative methods must tend to raise the love for conscientious design, besides being the only way in which an architect's taste can be formed.

Beside the purely professional aim that these lectures are intended to have, they may also prove interesting to those who have sufficient leisure to devote to the study of the arts. The great works of architecture and sculpture produced in Greece two thousand years ago—still regarded as canons of good taste, and in some cases unsurpassable—could never have been produced but for the appreciation with which they were received, and the high standard of public taste existing at the time. There is nothing that would have more influence on architecture as an art than a wider study of its principles by those who are destined to be its patrons. Every one cannot afford to possess a painting by a great artist (though the trade show-card of the present day has almost turned the cottage into a picture gallery), yet all are free to admire a public building. How much more interesting our cities would be if every building in the streets were to possess each some special character of structure or decoration that would turn it from a commonplace building to a work of art. This may be somewhat of a Utopian dream, but it is by no means an impossibility. I have not yet said anything about the condition of professional education outside our own country, but on the

Continent the education of architects is provided for in State colleges in a similar way to other professions, and men are not allowed to practise without holding a diploma—a restriction which English architects do not think deserving of imitation. In America several of the universities have well-equipped schools of architecture, embracing a highly scientific as well as a thoroughly artistic training, and whether from this cause or some other, a most remarkable development of good work has recently taken place in that country. Mr. Hill then proceeded with the lecture on Greek architecture.

DESTRUCTION OF THE GREAT MOSQUE OF DAMASCUS.

THIS venerable structure was destroyed by fire at midday on October 14, and it is remarkable that the reticence of the Turkish authorities has prevented any particulars of the conflagration, or measures for rebuilding the mosque, from appearing in the papers.

Sir W. Muir, the principal of the University of Edinburgh, in a communication to the *Scotsman*, says:—

It is the ancient cathedral of John the Baptist, which, on the conquest of Syria, A.H. 14, was occupied one-half for Moslem worship, while the other half was left to the Christians. In 90 A.H. the whole was taken possession of as a mosque, other churches being restored in compensation. Only the walls now remain, the greater part of the building having been gutted by the fire. The rooms of Hussan and Hoosein were only slightly damaged. The tomb of Saladin was not injured. The library, with its precious MSS., was saved; but the famous copy of Othman's Koran (the only surviving one of the four deposited by him in the chief mosques of the empire, A.H. 30) was kept in a receptacle apart, and not thought of till it was too late.

The walls are still standing, and the edifice will probably be rebuilt on their lines; but the colonnade, which extended the whole length on each side of the mosque, was destroyed, and though every effort will, no doubt, be made to restore the building to its pristine grandeur, its glory, one may fear, has passed away. Mohammed Saeed Pasha (for some years the leader of the pilgrimage from Damascus to Mecca) is said to have contributed 1,000*l.* towards the reconstruction; and a rescript is believed to have been received from Constantinople for the formation of a Commission to obtain contributions, the Governor-General being president and several civil and military officers, with leading citizens, as members. It is said that at their first meeting objection was made to the resort to pressure, as it would render unacceptable prayers offered in the new building, but little attention has been paid to the objection. Great enthusiasm undoubtedly prevails among the citizens in the work. Early in December a commencement was made by removing the *débris* to prepare for the rebuilding. The different quarters of the city send in large bodies of men to help, and the zeal is so great that even the female sex (including, one hears, even ladies of the Viceroy's harem) claim the privilege of aiding in the pious service of cleansing the sacred edifice from the off-scourings of the conflagration. It is said that the Shiah sect (*Rafideh* or *Arfad*, as they are called there) claimed the right of taking some part in the work, but were refused, and there was for a time some danger of a riot. About a month ago a gentleman, riding with his wife and son outside the gate, met a party of hundreds of men bringing a load of immense poplar beams, which they were drawing in a cart by ropes, with vociferous singing and clapping of hands. They turned sharply by another road, as it is hardly safe for a Christian to get among them in their present mood.

It is not very easy to understand why the Press has been prohibited from notices of the misfortune. No doubt the destruction of the Imperial Mosque of the Omeyyads had a very depressing effect on the city at the time. Whether the Government of the Porte feared a similar feeling on the Moslems elsewhere, or whether the news of the destruction of their famous mosque might be taken by the world at large as a fresh indication of the decay of the Turkish empire and Moslem prestige, it may be difficult to say; but such is believed to be the idea prevalent.

The Christians were accused by some at the time of the conflagration; but as it broke out in the daytime a little before noon, and began in the high roof of the building, the accusation was so manifestly baseless that it had little or no influence on the Mussulman population. Had it occurred at night, when the cause would not have been so clear, the imputation might have met with a readier acceptance, and it is impossible to tell what then might have been the consequences to the Christians. Moreover, there was a high wind in the direction of the Christian quarter, and if it had occurred in the night, when the inhabitants were asleep, the fire in the city would no doubt have been much more extensive. As it was some eighty to a hundred shops and twenty to thirty houses caught fire from the cinders on the south and east, the direction in which the wind was

blowing, but it was speedily extinguished. By night the danger would have been vastly greater, and with a fanatical mob excited by accusation against the Christians, their quarter might have been burned to the ground and plundered, with even a repetition of the terrible massacre of 1860.

It is a matter of interest that the famous Greek inscription is uninjured. It is on the door lintel over the silversmiths or sandal-makers' bazaar, and consists of the 13th verse of the 145th Psalm, with the addition of "Christ." Thus:—"Thy kingdom, O Christ, is a kingdom of all ages; and thy dominion from generation to generation." The survival of this inscription through the change of ages—a monument of the past, and it may be a prophecy of the future—is a thing to be noted, and is due, no doubt, partly at least, to its purport being generally unknown to the Moslems around.

THE STUDY OF ART.

THE prizes won in the Sketching Club competitions at the Manchester Municipal School of Art were distributed on the 12th inst. by Sir James D. Linton. In his address he said he had a strong objection to the ordinary lecture or discourse on general art subjects. Most of the matters referred to in such addresses they could read about for themselves in books, especially in that masterpiece of English prose, "Modern Painters," by John Ruskin. It would be more profitable to them, perhaps, if he confined the few words he had to say to some of the drawbacks he experienced and some of the fallacies that beset him in his own early career. In the work of young students he saw very often evidence of a struggle for what was called originality. He remembered that in his young days that struggle was just as intense as it was now, but it was then accompanied by a greater amount of ignorance. Had he known what he now knew on that point he would have gained very much in his after life. The effort to obtain originality arose from a great confusion of mind. Originality was simply the outcome of one's individuality, and to strive for it early in life was just like trying to run before one was able to walk. He would advise the young student to proceed in just the reverse order. If they were landscape or figure-painters, or even sculptors, they should have no hesitation in laying all the masters they could meet with under contribution. In other words, he would steal everything he possibly could from them. The dread in the student's mind was that in so doing he might appear to his brother-students or the public to be absorbed by somebody else, and to be a mere reflection. But he should remember that he could not give expression to his originality or individuality until he had acquired the executive ability necessary to show it, and you could only get that executive ability by watching your great predecessors and stealing from them. It was in that manner that David Cox, a man with strong individuality in his work and colour and treatment, obtained his executive ability. That great genius allowed himself to be absorbed by the mind and manner of his master, old John Varley, a man of great executive ability, but that did not prevent Cox's own individuality coming to the surface. The same remark applied to Turner, who was in his youth a great imitator, but whose individuality afterwards came out in those superb works, some of which, he believed, were to be seen in the Municipal Art Gallery of Manchester. With regard to the Sketching Club, in connection with which they were met, he desired to encourage it as much as he could as part of the School of Art. He had known himself many very clever students who had passed through art schools and taken prizes and medals, but he often wondered what became of them. He himself believed that many students were lost because in their early careers they were not taught how to express themselves outside the technical methods employed in the school. He contended that in the case of students who were preparing for the higher branches of art the study of form and colour and composition should be co-equal, and at the same time that the moment the student could draw he ought to be compelled to do composition. He contended that if a student was kept very much to one class of study it hampered him very much in after life. It was so in his own case. He remembered vividly the great difficulty he had, after going in a great deal for the antique, in taking to painting from life. The sketching classes ought to be regarded not as a mere offshoot of a school of art, but ought to be regarded as of as great value as the rest of the curriculum. In the Manchester Art School they had in Mr. Glazier an admirable master, and no doubt every possible advantage in carrying on their studies, but he did not see anything in the school applicable to landscape art. The consequence of its absence was that the students went out to nature without having learnt the executive ability of the landscape artist. He would like to see in that school—and the remark referred not merely to that school, but to all schools of art—two or three pictures, not necessarily large or expensive, illustrative of our great English school of landscape artists. He would like to see the Man-

chester School of Art doing something to revive the great art of landscape-painting, if that art could really be said to be dying, and he felt sure that towards this end there were gentlemen in Manchester who, if they were properly approached, would help them in the way of providing for the school some illustrations of English landscape art. He himself would be very glad to do something in the matter.



The St. Helens Library and Technical School Competition.

SIR,—Enclosed we forward you a copy of the whole of the particulars and correspondence relating to the competition for the St. Helens Library and Technical School, which has recently been given to the authors awarded the "second" premium by the assessor, although our design secured the "first" place.

We have carefully prepared a complete statement of the whole matter, including all letters, &c., and newspaper cuttings, which bear upon the subject, and intend sending a copy of the same to every architectural society in the kingdom which is allied to the Royal Institute.

The derogatory and far-reaching effect which such a grave miscarriage of justice must have, not only on ourselves personally, but the profession generally, cannot be adequately estimated, and we feel it our duty to give the utmost publicity and ventilation to the matter, and endeavour to make this a test case and see whether such questionable treatment can be perpetrated with impunity upon architects.

The Council of the Manchester Society of Architects are holding a meeting to fully consider what action to take in the matter, and either ourselves or the hon. secretary will advise you the result of same.

In order to further strengthen our professional claim and fitness to be entrusted with this work (after securing the first place), perhaps we ought to acquaint you that we are the architects for the following technical institutions, each having been obtained in "open" competition, and were adjudicated on by a professional assessor appointed by the committee:—Blackburn Technical School, Rochdale Technical School, Heywood Technical School, Widnes Technical School and Free Library and Winsford Technical School and Gymnasium, as well as being one of the firms chosen to periodically compete for the Manchester, Salford and Rochdale Board schools.

Feeling assured you will give us your fullest advocacy and support, we remain, dear sir, faithfully yours,

WOODHOUSE & WILLOUGHBY.

100 King Street, Manchester: January 16, 1894.

The documents sent us by our correspondents would make a large pamphlet, and we can only refer to a few of them. In the conditions for competition the committee undoubtedly reserve to themselves "the right to carry out any of the designs, whether premiated or not." After the announcement of the premiated designs the Town Clerk states that, according to the assessor, none of the three (in common with those unpremiated) can be carried out for less than 23,000*l.*, and before deciding "whether they will carry out any of the designs, and, if so, which," the committee will be glad to have any observations respecting the cost which the prize-winners may care to offer. An interview between Messrs. Woodhouse & Willoughby, Colonel Gamble and the committee followed, and the architects on October 27 say:—"As instructed, we will consider the most satisfactory method to reduce the expenditure." On December 20 the Town Clerk sends a cheque for 100*l.*, and states that the committee "have at length decided to have the works carried out by Messrs. Briggs & Wolstenholme." In mentioning the result some of the local papers stated that the decision was given after the committee had visited technical schools at Rochdale, Blackburn, &c. Messrs. Woodhouse & Willoughby, in reference to the statement, informed the committee on December 27 that, "To have it circulated in a public newspaper that the outcome of your inspection of our technical schools at Blackburn and Rochdale was to delegate the carrying-out of your work to the firm of architects placed 'second,' although it was well known that we were the architects of both the before-mentioned schools and that we were placed 'first' by the assessor for your structure, is most damaging and far-reaching in its effect, and also it gives us the right to require a full explanation and a sound reason why our design should be set aside in favour of one prepared by a firm who have had far less experience in the designing and equipment of structures of this kind than we have."

They also called Colonel Gamble's attention to the statement, who in his reply says, "I do not know who communicated the information to the papers, but I cannot conceive that it is in the slightest degree damaging to your professional reputation." On January 6, the Town Clerk writes to Messrs. Woodhouse & Willoughby:—"Not only were the conditions of competitions perfectly clear, that the committee were not bound to carry out any particular design, but this position was still further emphasised in my letter to you of October 12, asking you in common with the authors of the other premiated designs to submit amended plans, and yet again, at the interview which you had with the committee prior to the preparation of such amended plans, and further, to state that the committee are in no way responsible for anything that may have appeared in any newspapers. Under these circumstances, the committee consider that they are acting fully within their rights and are not in any sense required to give an explanation of their action."

"However, they desire me to say that they regret you should feel that their action implies a stigma on your professional status, as far from intending this the inquiries they have made with regard to your firm have been entirely satisfactory."

GENERAL.

An Exhibition is to be opened in Paris during the spring, of which the character is suggested by the title "Marie-Antoinette and Her Times."

The Royal Academy on Tuesday elected two more painters as Associates, viz. Mr. J. M. Swan and Mr. Arthur Hacker.

The French Exhibitors have presented a formal demand for compensation for their losses by the conflagration at the Chicago exhibition.

Three Builders were summoned on Tuesday by the Northwich Rural Sanitary Authority for constructing houses with windows that would not open at the top, in contravention of by-laws. As the windows were altered, a fine of 1*s.* in each case was inflicted, but the costs amounted to 24*l.* 13*s.* 6*d.* in all.

The Arts Committee of the Liverpool Corporation have nominated the following gentlemen to represent the Liverpool Academy on the hanging committee of the spring exhibition:—Messrs. James Barnes, R. E. Morrison, James Ireland and G. Hall Neale.

Mr. Alfred Darbyshire, architect (Darbyshire & Smith), has been elected a Fellow of the Society of Antiquaries.

The Surveyors' Institution will meet on Monday, the 22nd inst., when a discussion will take place on the paper read by Mr. E. J. Harper at the previous meeting, entitled "Trade Claims."

A Paper on "The Tunnels of the Dore and Chinley Railway," by the late Percy Rickard, will be read at the meeting of the Institution of Civil Engineers on Tuesday, the 23rd inst.

Mr. Archibald Macpherson, architect, Edinburgh, read a paper entitled "Theories of Architectural Proportion" at the meeting yesterday of the Dundee Institute of Architecture.

Mr. G. Sherrin has prepared plans for the new station of the Metropolitan Railway which is to be erected in Moorgate Street.

Mr. John Smalman Smith, chief justice of the colony of Lagos (and formerly the law correspondent of *The Architect*), has been gazetted to administer the government of that colony in the event of the absence of the Governor and of the Colonial Secretary.

Mr. James Wilson, C.E., engineer to the Greenock Water Trust, has resigned his place, as he is about to become a partner in the firm of Messrs. J. & A. Leslie & Reid, civil engineers, Edinburgh.

Mr. C. H. Crowther, of Huddersfield, the umpire in the arbitration between the Bradford Corporation and the trustees of Mr. R. Morrell, regarding certain land required in connection with the Westgate improvement, has made an award of 7,777*l.* The amount claimed was 10,400*l.*, while the Corporation assessed the value at 7,128*l.*

The Architectural Association Lyric Club has arranged to hold the second annual Cinderella Dance on Tuesday, the 23rd inst., at 7.30 P.M., at the Portman Rooms, W.

At the Meeting of the West of Scotland Iron and Steel Institute, Glasgow, the following papers were discussed:—Mr. E. J. Duff's "Electric Welding," Mr. E. H. Saniter's paper on "The Desulphurising of Iron and Steel," and Mr. John Barr's paper on "A Modification of Siemens's Gas Reversing Valve for Steel Furnaces."

The Architect.

THE WEEK.

MANY district surveyors appear to be anxious to satisfy the public about the advantage of a change in the system which will confer on salaried officials the carrying out of the Building Acts. Some of the cases which are heard in the law courts might be considered as inspired with that intention. One of the latest was *WALLEN v. LISTER*, which was heard on appeal before Mr. Justice HAWKINS and Mr. Justice LAWRENCE. It really involved the question of the permanent liability of a builder to pay fees and penalties in connection with one building. The penalties in the case only amounted to 7,300 $\frac{1}{2}$ %, but there was no reason why the amount should stop at that sum. On September 15, 1892, Mr. LISTER was served with a notice to perform certain work, and as it was not executed he was summoned. The magistrate's decision was not given until November 29, and it was to the effect that the prescribed works were to be carried out within six weeks. Meanwhile, the contract had been completed and the building handed over to the owner. But the builder was not considered to be free from his liabilities to the County Council. About five months afterwards he was summoned, and no less than eighty-six penalties were claimed. The summons was dismissed and the district surveyor thereupon appealed. Mr. Justice HAWKINS, in his judgment, discriminated so to speak between the office and the individual. He considered that a builder was somebody employed on a building, who came under the Building Acts as long as he was so employed; but when he ceased to be a builder, his liability as regards those Acts were at an end. It was necessary to obtain a magistrate's order to enforce a district surveyor's notice; but if the builder had no longer authority to enter on the premises, how could he be expected to obey that order? It would be tyrannical to punish a man for not doing impossibilities, and especially when the penalties amounted to 7,300 $\frac{1}{2}$ %. When the magistrate made the order he was not aware that the builder had completed his contract and therefore he exercised a wise discretion in refusing to enforce it or to impose penalties. In that view Mr. Justice LAWRENCE agreed and the appeal was dismissed with costs. The decision will compel district surveyors to be more prompt in sending in requisitions; but for those which may be necessary in the later stages of a contract, it is not easy to see how they can be made compulsory.

THE appointment of a dozen permanent inspectors for science is not to be accepted as an ordinary case of increasing the happy family forming the staff of the Science and Art Department. To some extent it is a revolutionary act which has startled the denizens of the comfortable "residences" at South Kensington from their composure. For years the Education Department, although ostensibly controlling South Kensington, has been able to exercise barely a nominal authority in that region. It has been supposed there was a power supporting the military and civil officials to which Whitehall was compelled to succumb. One of the consequences is that science and art, and with them the public interests, are sacrificed to the ease of a comparatively few gentlemen. Occasionally, outsiders were called in, such as artists and professors of science, and it was supposed they were to introduce a new and unofficial spirit into the Department. Care was, however, taken in their selection, and in a short time, as was anticipated, they were overcome by the spirit of routine. They became more circumlocutory and obstructive to new ideas than the permanent staff. Some of the larger towns have in consequence rebelled against the South Kensington system, to the wonder of the staff, who have never realised that the system was more than an affair for their own advantage. The failure of the teaching which is revealed by all the annual reports has at last compelled Whitehall to accept the risks of a contest with South Kensington. The twelve permanent inspectors, each of whom is to "take charge of a special

district and reside in one of the chief towns in their districts," are really Whitehall officials, who are to be constantly observing and reporting on the working of the South Kensington system. Their province will be science schools, but as the teaching of art is, if possible, in a more deplorable state, we suppose it will not be long before inspectors for art will also be appointed. The new officials have no easy task before them. The teachers of science do not appreciate the advantages of a system of inspection which is not intended to promote the ease of the humblest as well as the highest officials of the Science and Art Department, and for a time, at least, they are likely to be in a state of covert insurrection against the innovation. The inspectors will have chances enough to prove they are made of manlier and less pliable stuff than the majority of the examiners. If they will be firm in not allowing abuses to be cloaked, they may be assured the country will support them, whatever the risk.

THE proposal to erect baths at St. George's Pier-head, with a clock tower facing the Mersey, at a cost of 50,000 $\frac{1}{2}$ %, has been considered and approved by the finance and estate committee of the Liverpool Corporation. That the position was suitable was shown by the success of the existing small pier-head baths. They have an area of 1,255 square feet, and during last year were attended by no less than 58,657 bathers. In Cornwallis Street baths the number was 78,294, but the area is 4,641 square feet. In Stoble Street, with an area of 4,254 square feet, the number of bathers was 32,548. The water about the pier-head may not appear inviting to strangers, but it is found from analysis that it is not worse than is found in the majority of salt-water baths. It is not to be assumed that as the Mersey will be less needed for business purposes on account of the Ship Canal it is as well to utilise the river for bathing; on the contrary, the new buildings may be taken as evidence that many efforts will be made to increase the convenience of the port, and in that way to retain a hold on the trade of the world. It is also worth noting that the Conservators of the Mersey are endeavouring to prevent the throwing of chemical waste into the river, although it may not be offensive or injurious to the navigation.

THE competition for the transformation of the Pump Room in Bath appears to be at last determined. There were so many failures as to induce people to believe that the cause was something inherent in the system of competition. On Tuesday there was a meeting of the Town Council to consider the subject. It was, in the first place, proposed that the whole scheme should be reconsidered, in order to ascertain whether a less costly annexe would not serve all needs. That course was only approved on the understanding that Mr. WATERHOUSE, as assessor in the competition, and the author of the design to which he awarded first place, should have part in the deliberations. Diplomatic as was the proposal, there was only a majority of two in favour of it, the numbers being twenty-three against twenty-one. The figures will suggest the strength of the supporters of Major DAVIS's plans, which had gained second place. The third prize was awarded to Messrs. BAGGALLAY & BRISTOWE.

THE first of the "Monographs on Artistic Subjects," edited by Mr. P. G. HAMERTON, and issued from the office of the *Portfolio*, has "Rembrandt's Etchings" for a subject. About Mr. HAMERTON's competence to treat on any of the masters of etching there can be no question. In this case he has produced a guide for the student as well as for the amateur. The characteristics of the great artist's works, which are veritable gems, are explained with rare judgment. The modern processes of reproduction have enabled the publishers to give facsimiles of the most dainty as well as the most grave examples of REMBRANDT's etchings. The monograph costs only half a crown, and is therefore obtainable by students who are not wealthy.

LAMBOURN CHURCH.*

THE world having become weary of the grand histories in which kings and ministers strutted, there is at last a chance for village chronicles. In England and America they are especially appreciated, first, because it is interesting to have a peep at ordinary life in a remote age, and secondly, because men and women who do not possess family histories are glad to be assured that at least their surnames are not new creations. If CHRISTOPHER SLY, tinker, in his most besotted condition could feel a pride in the conviction that it was only necessary to look in the chronicles to discover how his family came in with "RICHARD CONQUEROR," why should a modern millionaire be denied the satisfaction of feeling that he also must have had ancestors? Accordingly the old county histories in folio have become the costliest of books, and a vast number of histories of small places on a big scale are prepared in order to supplement or supplant them.

The history of Lambourn Church is a creditable specimen. The author intended to have the whole Hundred of Lambourn for his theme. He found, however, there was a superabundance of materials. Accordingly, he resolved to publish a volume on Lambourn Church, which is to be followed by others on the manorial history of Lambourn and on the church and landowners of East Garston. If the world behaves well it may also be enriched "by the publication, in two or more volumes, of a complete transcript of the church registers of the two parishes, with notes." All over England the same industry is exhibited, and such is the appetite for ancient news, people are not satisfied with the available stores, for laments are heard about the destruction of records owing to the carelessness of the clergy and their clerks. As the life of man is on the average threescore and ten years, it is not easy to see how anyone can find time to do more than barely keep himself informed about English history as it appears under the new microscopic treatment. The demands of one's own age must be sternly renounced.

Lambourn, for instance, is not associated with any event that at one time would be considered as memorable. Its inhabitants were not famous, and happily not one appears to have gained temporary notoriety by a crime. We went on steadfastly through the lists and pages, in the hope that before we arrived at the finish our old acquaintance, the roystering MICHAEL LAMBOURNE, would in some way be associated with the Hundred. But the gallant cavalier who, by his own account, behaved so bravely at the siege of Venlo, and was thanked by Graf MAURICE at the head of the army, was a native of Cumnor, as could be testified by Goodman THONG, the bailiff. Now the Black Bear at Cumnor, where LAMBOURNE officiated, is about five-and-twenty miles from the George at Lambourn, and the honest agriculturists who met at the latter would probably desire to keep the redoubtable "Mike" at a still greater distance. As elsewhere in Berkshire, the craving for adventures in the Netherlands, Spain and the New World, which he could not resist, may have been felt in Lambourn; but, so far as is known, the inhabitants were all of the stay-at-home species. They seemed to be almost rooted to the soil, and Dr. PRIMROSE might have had them in his mind when he wrote about fireside adventures and migrations from the blue bed to the brown.

Lambourn was not peculiar. In the greater part of England life was an humdrum and commonplace affair during centuries, and on that account the people were likely to be happier than if they had lived in shires which were more susceptible to exciting influences. They were not without history. Mr. FOOTMAN combines the twelfth and thirteenth centuries in one chapter, but he is able to have a separate chapter for each century afterwards down to our time. There are records relating to a still earlier period. The events are not, of course, very startling, but even a small-beer chronicle can have interest for honest folks who care little about wine.

The earliest mention of Lambourn in a legal document occurs in ALFRED's will. The king declares that he gives to his wife "the home at Lambourn, and Wantage and Edington." There is also a reference to the place in one

of the St. Paul's Chapter-house Books, in which the rights or tithes which belonged to the Minster of Lambourn are described as warranted by a charter of CANUTE the Dane, and there is a curse invoked on all who would meddle with them. Subsequently CANUTE himself would appear to be liable, for he made over church and tithes to the Dean of St. Paul's. Thus began, says Mr. FOOTMAN, "a connection which was not to be severed for eight centuries, and which, though it has given to Lambourn a succession of titular rectors unequalled among English clergy, below episcopal rank, in fame, learning and piety, has yet proved by no means an unmixed blessing to the parishioners and church of Lambourn." In 1892 the tithes (which in the thirteenth century were of the value of 53*l.*) amounted to 1,254*l.*—a large sum to be mainly expended outside the parish.

Lambourn was an established parish in ALFRED and CANUTE's time, and its ecclesiastical establishment is therefore much older. It may be supposed to date from the origin of Christianity in the island, but the evidence can only be taken as probable. Nothing is known about the early churches. No part of the existing building appears to be older than the twelfth century. As survivals of that time are the outer walls, the bays of the nave, the clerestory windows and a small circular window in the west gable. There is also work of the succeeding centuries which is carefully described in the book, but, says Mr. FOOTMAN, "later alterations and additions have entirely transformed the appearance of the transepts and chancel, and the nineteenth century has ruthlessly destroyed the ancient roofs."

The late Mr. STREET would appear to be among the restorers who transformed the building. When describing the restoration of the chancel which he directed in 1861, the author says:—"The work as a whole is distinctly inferior to what we might have expected from an architect of such eminence. However desirable it may have been from an artistic point of view to elevate the external pitch of the roof, it surely could not have been necessary to replace the old oak ceiling within by the very uninteresting pinework which we see now; and even from the outside Mr. STREET's green slates, surmounted by ugly red-crested tiling, are scarcely an improvement upon the low-pitched roofs of the fifteenth century."

To architects one of the most interesting incidents in the history of the restoration of the church will be the employment of the late Professor DONALDSON in 1847 as reporter. His name is not commonly associated with such work, but he appears to have exercised admirable discretion in his recommendations. In one of his reports he says:—"The plastered ceiling of the nave should be removed entirely away, restoring to view the noble timbering of the roof, which will be a very handsome object, well worthy of the church, and in accordance with its original intention." When the plaster was removed it was found that dry-rot had invaded the timbers. With care it would have been possible to save the greater part of the timber-work. The sound oak pieces were, however, sold, and with the money a commonplace plaster roof was substituted, for which we hope the Professor was not responsible. Mr. BURY and Sir GILBERT SCOTT were also associated with the restoration.

Some peculiarities are found in the church. There are, for instance, two clerestory windows over the three eastern arches of the nave, and only one over the western. There is also a piscina "on the south side of the western arch, 13 feet from the ground; which shows that when the rood-screen was erected in the fourteenth or fifteenth century an altar must have been placed upon it."

Remote as was Lambourn, it was one of the districts that were coveted by the Norman invaders. Mr. FOOTMAN says that "when the Domesday Survey was taken, not one of the ancient landowners in the Hundred retained their property." The proprietors, at all times, appear to have wrung as much as was possible out of the people, for there are indications that Lambourn was always in a state of poverty. According to one inquisition, made in the fourteenth century, about seven hundred acres of land, which used to be ploughed and sown, were entirely uncultivated by reason of the poverty of the parishioners. A curious indication of poverty is also found in a letter from the Bishop of SALISBURY in 1380, ordering that the sentence

* *History of the Parish Church of Saint Michael and All Angels, Chipping Lambourn.* By John Footman, M.A. (Elliot Stock.)

of the greater excommunication should be pronounced in Lambourn Church, with all accustomed solemnity, against some unknown poachers, or "sons of iniquity," who had captured rabbits and other game on his lordship's warren.

Almshouses for five poor men existed in Lambourn before the fifteenth century, but how long is not known. There was a priest attached to the charity. The earliest notice of them is found in the will of JOHN ROGERS, who was sheriff in 1446. In it he says:—"I will that the priest have every year of ready money, at four times in the year, nine shillings and four pence, and every poor man eight pence in money every week to be paid; and fuel competent for the priest and for the said poor men to be had of Chiselden's Woods, and that the whole wood to serve only therefor; and that the priest have every third year three yards of Bruton russet, price 40d. the yard, and every poor man at the same time three yards of the same colour, price two shillings and six pence the yard." In 1501 JOHN ESTBURY obtained a license from HENRY VII. to found a chantry and an almshouse for ten poor men, which still exists. The chantry occupies the angle made by the south transept and St. Mary's Chapel in the parish church. The almsmen keep up the practice of praying at the tomb of the founder, and thus it happens that "Lambourn is one of the few parish churches in England where daily service has been held from the earliest times until the present day."

It is remarkable that in a place so quiet enough materials should be found for the preparation of a volume. The changes which took place in the State rarely altered the even tenour of men's ways in Lambourn. Fox, the martyrologist, with all his research, could not discover one Lambourn case which would increase the horrors in his work. Yet there is no doubt that Mr. FOOTMAN'S ability has built up a book which may be accepted as a characteristic description of English life in quiet districts, and as such it is a valuable contribution to archæological literature.

THE ROYAL ACADEMY.

ON Tuesday Sir Evelyn Wood, V.C., as acting Prime Warden, presided at a livery dinner of the Fishmongers' Company, at which several members of the Royal Academy and other artists were present.

The Prime Warden, in proposing "The Royal Academy of Arts," said that the President, who would respond to the toast, was one of the most conscientious workers of all the members of that illustrious body. It was during the Crimean war that Sir F. Leighton had made his first great essay in *Hector's Widow and her Child*, a picture which no soldier who had seen it could ever forget. In his own profession the artists had borne a noble part, and his own son, who was now in the army, had been a member of the Artists' Volunteer Corps. The Artists' Corps stood among the first of our Volunteer regiments.

Sir F. Leighton, in acknowledgment, said:—Mr. Prime Warden, my lords and gentlemen,—I hope I shall be pardoned if, before addressing myself to the subject of the toast, I express my regret that the present Prime Warden is prevented by an accident from dispensing the magnificent hospitality of the Fishmongers' Company. At the same time we cannot but congratulate ourselves that he has found so admirable a representative in the acting Prime Warden. I thank you, on behalf of the great institution of which it is my pride to be the chief servant, most sincerely for the cordial and graceful terms in which you have been pleased to invite your guests to drink to its prosperity; and to those distinguished guests our gratitude is no less due for the appreciative warmth with which they have received those words. For myself I am indeed aware that I am in this toast an official and unavoidable appendage; nevertheless, I cannot but warmly thank you for the friendly and flattering manner in which you have alluded to me personally; and, sir, since thanks are on my lips, let me before I go further acknowledge the aid I have received from this Company in the promotion of a work which has enlisted my deepest interest for some time past, namely, the removal to a fitter and worthier site, by the authority and with the aid of the Dean and Chapter of St. Paul's, and under the zealous supervision of the distinguished man in charge of the cathedral, Mr. Penrose, of the noblest monumental work that has ever issued from the brain and hands of an English sculptor—I mean the monument to the great Duke of Wellington by Alfred Stevens. This act of reparation has only been made possible by the pecuniary aid of public-spirited persons and bodies, and amongst those bodies the name of the Fishmongers' Company is not wanting. Let me add that in this matter I have been prompted, not only by the impulse to

honour the work of a supreme artist, but also by a warm desire to bear my part, directly or indirectly, in the artistic enhancement and adornment of this greatest and wealthiest, but, alas! not the comeliest of the cities of the world. It is an agreeable task to me to acknowledge a toast conveying appreciation of the work done by and the spirit that animates the body I here represent, for I believe that appreciation to be deserved. Now, in judging that work it is necessary to bear in mind what the function of such an institution is, and what it is not. It is not the attribute of any school to impart genius, or that lesser thing, talent—these are divine gifts that do not lie in the hands of men; to a school it belongs to train and strengthen the gifts which nature bestows on those who come within its control, to put into their young hands the weapon of knowledge, and to give guidance to faculties which it cannot impart. And this our schools lay claim to do in a broad and liberal spirit, bringing the young artists who frequent them into contact with various modes of thought and methods of work in the persons of a succession of teachers representing the different personal tendencies which, in their manifold variety, make art so interesting. And this variety among its teachers the Academy seeks to obtain by the exercise of a wise and large-hearted catholicity in the choice of those whom in each successive year it gathers into its brotherhood, so that there is hardly a single direction in which the art of our country expands itself in its freedom which is not represented in the Academic body. It is easy to taunt such a school by saying that it does not enshrine and hand down a definite body of traditions, which means a number of rigid and inelastic maxims. It does, I think, a better and a wiser thing, for whilst upholding by means of exhibitions the knowledge of and reverence for the great masterpieces of the art of the past, it strives to represent within itself and to embrace within its scope the living actual art life of the country. In this way, and in this way alone, can it be hoped to foster new and wholesome growths on the great golden tree of art. To contribute to this end is a noble function; it is one in which I claim that the Royal Academy takes a prominent and honourable part, and I see a recognition of the justice of this claim in the toast for which I have now again the honour to thank you.

DUNDEE INSTITUTE OF ARCHITECTURE.

AT the first ordinary meeting of the session of Dundee Institute of Architecture, Science and Art, Mr. Wm. Mackison presided. A remit was made to the Council to consider the relationship in which the Institute and kindred associations in the city stand to each other, with the view of discovering whether it would be of advantage to move in the direction of co-operation. Mr. W. Ryle Smith, Broughty Ferry, was elected a member, and Mr. Alex. Laburn, Dundee, an associate of the Institute. The Chairman stated that an opportunity would be taken of inviting the members to inspect the Dundee Electric Lighting Station, which, he said, was in a most complete state and well worthy of inspection, and over which the engineer, Mr. Brownlee, had kindly expressed his willingness to show those connected with the society. It was further mentioned that if desired a visit to the gas works might be undertaken, and the Council was appointed to make arrangements therefor. The lecture of the evening was delivered by Mr. Archibald Macpherson, architect, Edinburgh, who spoke on "Theories of Architectural Proportion," illustrated by drawings and views shown by limelight. In the course of his lecture Mr. Macpherson adverted to the rage which prevailed among certain theorists about sixty years ago to discover some geometrical principle in the proportions of ancient buildings. Among the theories thus dealt with was that of Viollet-le-Duc, which was based on the equilateral triangle, and a number of the illustrations exhibited agreed with this idea to a remarkable extent. The same theory was applied to a number of Scottish buildings, and in this connection there were shown a series of beautiful views of Dunblane Cathedral, which were specially interesting to those present in view of the proposed visit of the members of the Institute to the ancient edifice in the early summer. In conclusion, the lecturer remarked that if the principle that he had referred to were followed out to the extreme logical conclusion, the designing of a noble church would be reduced to the level of the solution of a geometrical puzzle, and no series of geometrical ratios could ever take the place of the cultured mind and the trained eye of a true artist. On the motion of the Chairman, Mr. Macpherson was cordially thanked for his lecture.

A Gift of 150l. has been received by Mr. John Macleod, hon. treasurer of the Association for the Promotion of Art and Music in Glasgow, from the United Co-operative Baking Society, Limited, in aid of the fund for the erection of the Art Galleries, Museum and School of Art at Kelvingrove.

THE INSTITUTE PRIZES.

THE following review of work of the travelling students, 1893, and of that submitted for prizes and studentships, 1894, was read by Mr. Alexander Graham, F.S.A., at the meeting on the 15th inst. :—

It has been the custom in recent years to depute some member of the controlling body of the Institute to prepare a series of critical notes upon work submitted annually in competition for the prizes and studentships, and to embody such notes in the form of a short paper to be read at an early meeting of the new year. It is a privilege for any one to take part in such a proceeding, and it is my pleasing duty on this occasion to record the sense of gratification with which the Council have viewed the many beautiful drawings that now adorn the walls of the gallery. It may seem an invidious task to play the part of a critic in any matters on which there is obviously divergence of opinion; but criticism in this room is intended for friendly hearers, and the motive of such criticism is solely for the encouragement of our younger brethren, to lend a guiding hand to those who are on the threshold of their career, and to promote that which is common ground for us all—the advancement of architecture.

The work under consideration may be classed as follows :—

1. Measured drawings and sketches; 2. Original designs;
3. Literary work in the form of essays; 4. The work of the travelling students of last year.

Measured Drawings and Sketches.

It is a matter of regret that the Institute medal given for so important a branch of study as measured work should have attracted only two competitors, whereas the Pugin studentship, which, it must be admitted, offers an almost unlimited field for the experienced sketcher, has enlisted the artistic services of six candidates of more than average ability. The reason for this is apparent. Sketching is a fascinating pastime for any one who can use a pencil or a brush with ordinary facility. It enables one to exhibit at a friendly gathering a pleasing record of a well-spent holiday, it forms material for a pretty volume for the drawing-room table; and whereas geometric line drawings, devoid of pictorial effect, appeal only to professional judgment, sketches in any form are intelligible to the non-professional mind, whether male or female. But pretty sketches, simply as little pictures, have no practical value, nor will they help an architect in his daily practice. A few careful measurements of any portion of a well-designed building, showing the size and jointing of the masonry, as well as its scale and surroundings, committed to paper on plan, section and elevation, will prove more instructive and more useful than whole sheets of pictorial bits which may have attracted the eye at the passing moment. This truism has been so often propounded in this room as almost to require an apology for repeating it. Let us hope that pegging away in a good cause will ultimately have a beneficial effect.

As drawings of measured work nothing can be better than those of the north transept of Lincoln Cathedral, submitted by Mr. James R. Wigfull [A.] ("Saint Hugh"), to whom the medal has been awarded. Lincoln, with its charms of line and form and proportion, is always attractive to the student as well as to the advanced architect, and although nearly every part of the structure which is worth sketching or measuring has been committed to paper in recent years, such drawings as these are very welcome as a valuable contribution to the portfolios of the Institute. They are exactly what measured drawings should be: clear, precise, full of meaning and without any attempt to produce pictorial or meretricious effect. The other competitor, with the motto "Universum Studium Meum," selected one of the subjects suggested in the annual programme, viz. the tomb of Henry III. at Westminster. The drawings have not failed for want of merit, but on account of the greater merit of the Lincoln drawings. The monument, which is interesting from an antiquarian point of view, has been very carefully delineated.

And here I would venture to suggest that measured drawings for which prizes have been awarded should be turned to more useful account than has hitherto been the custom. For nearly fifty years the holders of the Silver Medal have deposited in our library a copy or reproduction of their drawings, and consequently there is a mass of useful material stowed away which is certainly accessible, but not easily so. These reproductions, it must be remembered, are careful delineations, line for line, of a large number of monumental buildings, many of which have been restored or disfigured in recent years, or in some cases have perished altogether. Would it not be as well therefore to classify this good material, and to adopt for the future some uniform system of reproduction? Such reproductions could be obtained at small cost; they should be of fair size, and should be bound up in volumes from time to time. As matter for study or reference they would be invaluable, and I venture to think the scheme would not prove unremunerative to the Institute from a financial point of view. Moreover, it would be an encouragement to younger men, who would thus

become contributors to a work of exceptional and lasting interest.

The large number of sketches submitted by six competitors for the Pugin studentship is a clear indication that there is no lack of energy in the rising generation, and that the power of sketching with facility is spreading rapidly through our ranks. It is impossible, however, in this necessarily brief notice to do justice to the merits of so many aspirants to distinction in this branch of manipulative art. Mr. R. Shekleton Balfour [A.], whose measured drawings of Heriot's Hospital gained the Institute medal in 1892, has been successful in carrying off this studentship, and, we may add, has well deserved it for his admirable series of sketches in pencil and colour. Such good work as Ethelreda's Shrine at Ely, the series of drawings of the charming old bede-houses at Higham Ferrers and Lyddington, and that interesting specimen of Early Italian art, the tomb of Benedict XI. at Perugia, are quite up to the mark. A word must be said for the excellent sketches of Mr. J. Paul Cooper, principally illustrative of Gothic architecture in Italy. It is a question whether such sketches, admirable though they be, are admissible for a prize awarded "for the promotion of the study of the Mediæval architecture of Great Britain and Ireland." The founder of this studentship was one of those men who regarded the duties and responsibilities of life, as well as everything he undertook, with exceptional gravity. There is little doubt that so earnest a thinker and so diligent a student of Mediæval work in this country was actuated by a desire that others should follow in his steps and perpetuate the good work in which he himself achieved such marked success. It would be as well, therefore, if candidates paid reasonable regard to the intentions of the founder, confining their attentions more especially to remains of Mediæval buildings at home rather than abroad.

These remarks are in some way applicable to Mr. W. Curtis Green's careful drawings of Ye Old Oak House, West Bromwich, which might be classed as Mediæval, though some of the details give indications of work of later date. Portions of Gloucester Cathedral have proved attractive to Mr. Alfred J. Dunn, who has given a sheet of interesting drawings of the wax paintings on the reredos in the lady chapel. But the pencil drawings are not all equally satisfactory, partly owing to want of precision, and partly to the adoption of drawing discontinued lines. This style of draughtsmanship is not to be commended, and should not be encouraged. For the second time Mr. Thomas A. Sladdin has unsuccessfully entered the lists with some excellent, conscientious work, such as the details of Fox's Chantry at Winchester, and Mr. H. C. Corlette [A.] gives some measured drawings of St. Anastasia at Verona, together with some beautifully-coloured sketches of the ornament in the vaulted ceiling of that noble church. A medal of merit has been deservedly awarded for such excellent work. These coloured sketches should be specially noticed, because they will give future candidates for the Owen-Jones studentship some idea of the class of colour-work which the Institute desires to encourage, and which would have obtained favour with the distinguished founder of that prize.

No award has been made this year in the Owen-Jones studentship, on the ground that neither of the two candidates had attained that standard of excellence which had been maintained in previous years. Mr. A. T. Bolton's contributions were considered insufficient, and those submitted by Mr. T. Rogers Kitsell, the Tite prizeman for 1892, did not altogether satisfy the judges, in spite of the merit conspicuous in many of them, such as the series illustrative of textile fabrics in the South Kensington Museum.

Original Designs.

The subject selected for competition for the Soane medallion has brought ten candidates into the field with a large number of designs of varying merit. This much-coveted prize has been awarded to Mr. James Humphreys Tonge ("Nil Desperandum") for a clever picturesque design and for a fairly workable plan. But it is puzzling to know what could have induced so capable a designer to carry cross walls right through the centres of a series of bay-windows. This occurs in no less than twelve places. These bays, which are conspicuous features in the quadrangle, are designed externally as one window, and not as two separate windows. Another defect in the planning is the position of the water-closets, which are grouped together close to the main entrance gateway and are accessible only by passing in front of a sitting-room window. The conditions of the competition included the placing of these conveniences in a detached block. In its strictest sense this means a detached and isolated building, but the framers of these conditions may have meant that they were to be kept together as much as possible. Anyhow, this somewhat inelastic condition has proved difficult of solution, and though each competitor has tackled the subject in his own way, it cannot be said that the efforts of any one of them have been attended with marked success. It may be some consolation to Mr. R. S. Dodds [A.], the author of "Quien Sabe," to know that his general design

found almost as much favour with the judges as the one placed first. Its quiet collegiate character, the marked exercise of restraint in the treatment of wall-surfaces, and the excellent proportions of the gateway-tower are the most noticeable part of the design. Perhaps it would have been as well to have broken the long line of frontage of the inner quadrangle by a bay or projection or by a different treatment of skyline, but it is difficult to judge of the pictorial effect from one perspective, which is isometrical. Here, again, the condition as to the detached block has been met by placing the water-closets at the extreme end, and so far removed from one part of the building that some of the occupants would have to traverse a distance of about a thousand feet in one journey there and back. This cannot be considered convenient. In other respects, assuming that such a site could be obtained for a building with a depth of about 400 feet, behind which is the college garden and beyond is the master's residence, the arrangements shown on the plan are workable. The hall and kitchen offices are rightly placed, and the position of the Fellows' common-room has been well considered. A medal of merit has been awarded to Mr. G. S. Hill ("White Star") for a picturesque group of buildings in brick and stone, drawn by a skilled hand. As a composition it would have gained by less elaboration and by the exercise of a little restraint in the treatment of the wall surface. The single rooms for students, with space for a bed and with one angle screened off to form a pantry, scarcely comply with the instructions, but the positions of the water-closets in octagonal blocks, with access from a corridor, may be said to meet the written requirements. For an excellent set of drawings and details submitted by Mr. Henry Mitchell ("Black Lion") honourable mention has been deservedly made. As a matter of criticism it may be asked what purposes are served by the two towers, except for external effect, and whether convenience was considered in making the dining-hall so very lofty. It should be observed that the pantries are without light or ventilation, although there would have been no difficulty in obtaining a sufficiency of light through narrow windows in the external wall; and as an attempted solution of the problem of the water-closets already referred to, they are placed off the staircases somewhat after the manner now generally adopted in hospital construction. To meet this arrangement, which is not inconvenient, the corridor or cloister below is blocked with supporting piers, completely sacrificing the charming effect always produced by the long unbroken lines of a well-proportioned and adequately-lighted gallery or corridor. All the other competitors have attacked the subject in different ways, but with doubtful success. Planning is an art that with some men is almost a gift, while by others it is attainable only after long practice and as the result of much experience. Wasted space, in the form of loggias, pantries without light, staircases lighted solely by skylights, and water-closets in a central block forming a conspicuous feature on entering the college gateway, are a few instances of defective planning noticeable in many of these designs.

The style of architecture adopted by the competitors is much on the same lines, with the exception of one who has given a design of Jacobean character. The nature of the subject was necessarily restricted in respect of style. Indeed, it may be said that the style of collegiate buildings in a university town in England is almost traditional, although these traditions have been set aside on many occasions, markedly in recent years. Still it could hardly be expected that so severe a type of Classic architecture as was in vogue when Soane, the founder of this medallion, practised with such distinguished success, nor even the lighter forms of the Renaissance, which prevail in the chief cities of Italy and Spain, would have found favour in this competition. If any of the candidates had adopted such styles, it is highly probable that his labours would have been in vain. May we not, therefore, assume that the subject precluded a number of able men from taking part in the contest—men whose studies had been more particularly directed to the various styles of Classic architecture? and may we not hope that, in future years, the subject selected will be one that readily admits of every kind of treatment, and with some prospect of success? I am led to make this remark in consequence of having frequently observed how much independent thought is noticeable in the original designs prepared for the examination qualifying for candidature as Associate. It is true that many of these designs are not of a very high order, but they show the tendency of our rising school, and in that respect the movement deserves encouragement.

The Tite prize has only attracted four competitors. One would have thought so fascinating a subject as a Royal Mausoleum, to be treated according to the principles of Palladio, Vignola, Inigo Jones or Wren, would have brought a larger number of candidates into the field. No one of the designs has attained such excellence as to evoke unqualified admiration, the merit lying almost as much in the plan as in any special skill in architectural composition. The prize has been awarded to Mr. A. R. Hennell ("Semper vigilans") for a

simple design after the manner of Palladio. The plan is meritorious, and the internal effect of the four bays with their domical roofs could not fail to be pleasing. No construction is shown, nor is it asked for, but it is presumed that the cupola, which is only 22 feet in diameter, rests upon girders over the gallery front. The external effect would have been better if the cupola had been about 2 feet larger; the only difference that it would have made internally would have been the reduction in the width of the gallery, but this would have been of no consequence. It is difficult to understand why the author of so creditable a design should have gone out of his way to break the pediment over the entrance doorway. Such a treatment is not to be commended. In the present instance, if the raking lines had been continued to the apex, and heraldic or other sculpture introduced in the tympanum, the building itself would have gained considerably in breadth as well as in general effect. The perspective drawing does scant justice to the design, and it is fortunate for the author that the merits of the composition and not the perspective had full weight with the adjudicating committee. The design bearing the device of a red cross is picturesque, but the architecture does not belong to any particular school. The general conception of the plan is meritorious, but it is doubtful whether an arrangement applicable to so large a building as the *Invaides* is suitable for an edifice of such very moderate dimensions. The staircase block, which has been made a conspicuous feature of the design, would not have a pleasing effect from many points of view, and the inner angle formed by the junction of the two blocks, one being circular and the other square, would require much more consideration than the author appears to have given to it. Another design, contributed by "Wren," deserves notice as a study of the works of Wren. But the proportions are not those of the great master. The cupola is but a transcript on a small scale of the dome of St. Paul's, without the lantern; and the portico, which might have been made an effective feature in the composition, if proportions had been studied, detracts from rather than contributes to the general effect. It is a matter of surprise that none of the candidates were inspired by Bramante's charming little circular chapel of San Pietro in Montorio, which seems to lend itself to such a subject as a royal mausoleum. It possesses many of the characteristics of the school of Vignola; and, for subtle proportions, balance of parts and pleasing outline has not been surpassed by any other work of its kind.

For the Grissell medal there is only one competitor. This is a matter of regret, for the subject, a timber dome with a lantern, is within the scope of any man who has had a moderate share of practical experience. The result is not altogether satisfactory, for the drawings exhibited are incomplete in themselves, and the subject, although commenced on right lines, has evidently not been fully worked out. It is hoped that the same subject, or a similar one, will be given again, and that the author of this design will not be discouraged, but exercise his powers again with more fortunate results.

Literary Work in the Form of Essays.

We now turn to the literature of the year in the form of ten essays of varying merit on "The Treatment of Sculpture in its Relation to Architecture." On three occasions during the last ten years this medal has not been awarded, once in consequence of no essays having been received, and twice owing to the work submitted having failed to satisfy the examiners. Last year was a case in point, when an experiment was made to test the literary powers of the rising men amongst us. The subject was a difficult one, and appealed especially to men of considerable culture and of high literary attainments. The result was unsatisfactory. This year the subject may be regarded as an easy one, evidenced by the fact that ten candidates entered the list for this honourable prize. After careful examination and studious perusal of an unusually large amount of manuscript and type-writing, the adjudicating committee decided in favour of the one bearing the device of a crown and thistle. The author of this essay is Mr. John Begg [A]. Medals of merit have been awarded to Mr. C. Bernard Hutchinson [A.] ("Nemo Repente") and Mr. Walter K. Shirley ("The Godhead Fires"), and honourable mention has been accorded to Mr. Percy Charles Campbell ("Pandrosus"). And here I should like to say a few words in friendly criticism upon the general character of these essays, not only those on the table before us, but on those submitted in competition in previous years. Essay-writing is a gift allotted to the few. To some it comes in earlier years by intuition, to others the facility is often attained by long course of study and diligent perusal of the few authors whose distinguished names are associated with this branch of literature. It is only on very rare occasions that a high standard of excellence, both in the material as well as in the composition, can be reached, and that standard has not, in the opinion of those who have read these essays, been attained in this last competition. There seems to be an idea, as exemplified in so many instances, that illustrations, mostly in the form of photographs, are the backbone of the composition, and that so

many pages of descriptive matter, supplemented by a few comments, constitute an essay. Without any desire to undervalue the zeal and untiring labour that has been shown in any marked degree by so many competitors, or to discourage in any way the aspirations of those who will take part in this competition in the near future, I would only venture to suggest the study of the pages of some of our great essay-writers, and learn from them the form and method adopted in building up their work, as it were, from the starting-point.

The Work of the Travelling Students, 1893.

We will now briefly consider the work of the travelling students of last year, noting, in the first place, the valuable labours of Mr. Banister F. Fletcher [A], the holder of the Godwin bursary. As a practical study of a notable group of temporary buildings, the handsome well-illustrated volume before us, entitled "Report on the Columbian Exposition at Chicago, 1893," will take honourable rank as a work of reference. Many of the illustrations are familiar, but special attention should be directed to those relating to iron roofs of large span. They are clearly defined and will prove valuable to those whose practice demands an intimate knowledge of this branch of architectural construction.

It is always gratifying to note the work submitted by prizemen of a previous year, and it is rarely disappointing either in quality or quantity. Men who have passed with distinction the ordeal of a first exhibition of their powers are not likely to fail in the expectation of their brethren, nor is the enthusiasm that prompted them to enter the lists likely to flag when the first steps are taken in a career of usefulness and honour. It cannot be said that any one of the prizemen of last year has failed in any particular. We therefore welcome them once more with a note of congratulation for so much good work well done. Mr. Arthur J. Bolton [A], the Soane medallist, has returned with some charming sketches and measured drawings of buildings in Spain. Nothing could be better than the pencil drawing of areja at Burgos and another of the stone lantern of the Giralda at Seville. We will pardon the omission of the terminal figure, which is probably inaccessible, but fully appreciate the labour and inconvenience in measuring the work shown on the drawing. Then we have a careful elevation of the Cathedral tower at Granada and, amongst others of equal excellence, details of the cloister of the Collegio Irlandeses at Salamanca—a good specimen of Spanish work. The drawings sent by Mr. John J. Joass, the Pugin student, will compare favourably with the work of his predecessors. Attracted especially by the buildings of his native land, Mr. Joass has given a series of drawings of great interest. The drawing of a cabinet at Holyrood is deserving of notice, and so are those illustrating Craigevar Castle. It is a question whether such a building can be classed as Mediæval in the sense in which the founder of this studentship would have interpreted it. Mr. Charles A. Nicholson, the Tite prizeman, has brought a series of beautiful drawings in pencil and colour, the result of a tour in Italy. The view of St. Maria dei Miracoli is quite up to the mark, and the fine perspective interior of St. Anastasia at Verona is specially noticeable. Taking this drawing as a companion to Mr. Corlette's details of the ornament, already referred to, we obtain an excellent idea of the form and colour of this noble church. Mr. Alfred H. Powell, the Owen-Jones student, exhibited such marked appreciation of colour in the drawings submitted last year, as well as a high order of draughtsmanship, that it seems unnecessary to say that the standard of excellence, shown by a series of beautiful drawings, has been fully sustained. A glance at the screen on which they are exhibited will more than satisfy the good opinion previously expressed of Mr. Powell's artistic work.

These, gentlemen, are the somewhat imperfect notes on the students' work of the year, penned in good faith, and with the sole desire to encourage, and not to dishearten, our younger brethren in their onward career. I will conclude with a caution—not to devote too much time to the production of sketches, simply as little pictures. Draughtsmanship, after all that can be said in its favour, is but the handmaid of architecture, and sketching is a pleasant means to a nobler end. Some of the greatest works of mankind were erected in an age when draughtsmanship, as we understand it, was utterly unknown. It is in the application of what we see and sketch that the true test of our abilities as architects is to be found.

The meeting terminated with a vote of thanks proposed by the President to Mr. Graham; with a vote of thanks also to the President, which was proposed by Mr. R. Phené Spiers.

Messrs. Oliver & Leeson, architects, on Saturday afternoon conducted the members of the Northern Architectural Society through the Chillingham Road Board Schools, Newcastle, for the purpose of examining the "Plenum system" of heating and ventilation.

ARCHITECT'S FEES.

AN action was heard at the Bradford County Court before Judge Gates, Q.C., and a jury, in which Mr. Frederick S. Smith, architect and surveyor, of Ilkley, sought to recover the sum of 37*l.* from James Lund, of Ilkley, being the balance of an account for services rendered. The original claim was 47*l.*, of which sum 10*l.* had been paid by the defendant. The defendant also paid the sum of 13*l.* 11*s.* 6*d.* into court. The case for the plaintiff was that the defendant was the owner of six semi-detached houses in Beanland's Parade, Ilkley, for which he paid about 220*l.* per house, but which originally cost the Victoria Land Company about 400*l.* each, without land and drainage. The six houses were in three blocks, and the defendant decided to build in the two spaces between, so as to form a terrace. He consulted the plaintiff on the matter, and plans were prepared. The defendant also wanted cellars to be made under the new houses, which cellars were to be used by the inhabitants of the already-existing houses, and the designs had also to show the ridges of the roofs of the old houses raised above the roofs of the others. The defendant asked plaintiff what his charges would be, and the plaintiff said they would be 4 per cent. on the total outlay. If the building and alterations were not proceeded with he would charge for work done in the usual way. The plaintiff drew plans, but the Local Board declined to pass them on account of the peculiarity of the arrangement of the cellaring. They also wished to keep the open spaces vacant, and said that building on them was a breach of the covenant. The defendant consulted his solicitors, and ultimately the plans were, with certain modifications, passed by the Ilkley Local Board. This, however, necessitated fresh plans being prepared by the plaintiff and also some additional work. The lowest tender for the four houses was 1,225*l.* On this the defendant said that he could not build at that cost. The plaintiff thereupon made various reductions to bring the cost down to about 700*l.*, but the defendant abandoned the work. The plaintiff's claim was made up as follows:—Two per cent. on the estimate of 1,225*l.*, 24*l.* 10*s.*; extra plans, 3*l.* 10*s.*; quantity, 1½ per cent. on 1,225*l.*, 16*l.*, with other items. The defendant offered to pay at the rate of 2 per cent. on 600*l.*, 12*l.*; estimates, 1½ per cent. on the same sum, 7*l.* 10*s.*; lithographing, &c., 2*l.* 10*s.*, with other items, making a total of 23*l.* 11*s.* 6*d.* The defence was that the architect was limited by the defendant to a cost for the building of not more than 420*l.*, and the want of proper care and skill on the part of the plaintiff in not preparing plans in accordance with that limitation was the reason why the buildings had not been proceeded with. His Honour said that the defence went to show that the plans were worthless, and that the defendant need pay nothing, whereas he had paid money into court. Counsel for defendant contended that he was entitled, if he wished, to take up the position his Honour suggested, but the plaintiff, he admitted, had done a certain amount of work for the defendant conscientiously, and for this he should be paid. Evidence was given on behalf of both parties, and it appeared that a clause in the deed provided that no house should be erected on the land to cost less than 120*l.* The defendant said that he proposed to get over this provision by taking an average of the cost of the existing houses and the new ones, and that with this intention he instructed Mr. Smith that the new houses were not to cost much more than 100*l.* each, and the utmost limit was 420*l.* for the four. The jury found for the plaintiff for the sum of 37*l.* 10*s.* 6*d.*, including the money paid into court.

TESSERÆ.

Italian Monasteries and Roman Houses.

FLEURY observes that in monasteries we see reproduced the arrangements of the antique Roman mansion as Vitruvius describes it. "The church, which stands foremost, so as to allow free access to seculars, occupies the place of that outer hall the ancients designated atrium, from which was entered a court surrounded by covered galleries, known as the peristyle, precisely corresponding to the cloisters we enter from our churches; whence we pass into other compartments, the chapter-house answering to the exhedra, the refectory to the triclinium of the ancients; and the garden, usually at the back of the edifice, is placed also like that of the antique residence. A Roman Council in 826 ordered that, attached to the church, should be built cloisters in which the clergy may dedicate themselves to ecclesiastical pursuits, where there must be one refectory and one dormitory common to all"—a plan apparently intended for those of the capitular bodies who lived together under a rule. The primitive, monastic homes of Italy were almost all destroyed by the Huns or Saracens and rebuilt in the tenth century, for the greater part by German monks then esteemed as architects; some it is supposed (V. Ricci, cap. x.) by an Irish monk who had attained renown in this art, Dungallo, as his name is Italianised. Those ancient cloisters were, no doubt, plain and rude constructions, but one excel-

lently useful adjunct, the bath, is mentioned in several monastic constitutions. The use of this, in primitive times, was not only advised but enforced.

Colour and Heat.

The influence of colour on the heating of bodies was considered by Leslie in an original manner. It was found to be effectual only when the radiations are luminous. A thermometer painted black or white (provided the texture of the surface be the same) parts with its heat and also absorbs the heat derived from such a source as boiling water in an almost equal degree. The effect depends chiefly on the degree of polish or condensation of the surface. But with luminous sources of heat the case is widely different. This subject had been carefully considered previously to the date of Leslie's work by Sir W. Herschel, who had studied the absorbing power of different colours on the sun's rays. Black and white form the two extremes, and Leslie availed himself of this principle to construct his photometer, which certainly (whatever may be its defects) is an elegant modification of the differential thermometer. It is an instrument having one ball of black, the other of pellucid glass, and united by a tube of the form of the letter U, containing sulphuric acid tinged red as an indicator. As the texture of the surfaces of both balls is the same, dark heat is equally absorbed by both, and the indicating liquid remains stationary. But in the sun's rays, or even in common daylight, the dark ball becomes most heated; and it is not unreasonable to conclude that when the source of heat remains the same, its variations of intensity are correctly shown. Leslie, however, erred in considering that it was applicable to measuring light differing in origin and quality on a comparative scale; and this error he unfortunately persevered in, after unquestionable experiments had shown its fallacy.

Thomas Proctor.

Thomas Proctor (born in 1753) was a student of painting in the Royal Academy. At the time of the annual competitions for prizes he one year presented both a drawing and a model from the life for the premiums of the silver medal, and he obtained a medal for each. Afterwards he won the gold medal, and was carried by his fellow-students around the quadrangle of Somerset House. Benjamin West, struck with his merit, took proper means of communicating to him his advice to undertake some historical subject for the next exhibition. Accordingly, Proctor sent to the Academy the model of *Ixion on the Wheel*, which was so highly approved by the members of the Council that it was by their orders placed in the centre of the library, separate from all the models, and secured from risk of damage. The work was greatly and universally admired, and was purchased by Sir Abraham Hume. In the following exhibition Proctor, encouraged by success, sent a group of *Pirithous Slain by Cerberus*, which was not less admired than the former work, and was purchased by the same liberal patron. In a third year, conceiving his powers to be strengthened by experience, he undertook a much larger group of *Diomedes, King of Thrace, torn to Pieces by His own Horses*. This masterly work obtained a degree of admiration far surpassing that bestowed on his former models, but by no means exceeding its merits. In professional judgments it rivalled the powers of Michel Angelo, and stood inferior to Phidias alone. Benjamin West said that no praise could be too great for it. But the admirable group found no purchaser. At the close of the exhibition it was carried back to the house of the sculptor, who, stung to the heart with disappointment, and not being able to pay for a shelter in which to keep it, with his own hands broke the model to pieces. From this period Proctor appeared no more at the President's house, where he had become a frequent visitor. On inquiries being made, it was reported that he had lately been met very meanly dressed, and apparently labouring under the greatest dejection of spirits. A further research ascertained that after the unexpected neglect of his last work he had abandoned himself to inactivity, having taken a lodging at sixpence a night in a garret in Clare Market, supporting himself on no other food than dry biscuits, and resorting to the neighbouring pump for his only liquor. Deeply affected by this account, Benjamin West, who had become president, hastened to propose the consideration of Proctor's state to the Council of the Royal Academy, where it was immediately moved that he should be sent to Italy by the Academy, with the usual pension, and that 50% should be moreover allowed to him to make the necessary preparations for his journey. This motion being carried, he was invited to dinner by his friendly protector, and after dinner the resolutions of the Academy were communicated to him. Proctor listened to the report with extreme emotion. It was settled that he should instantly prepare for his journey in company with the President's son. Everything conspired to elevate hope and to promise satisfaction. The probable day of departure was named, and the grateful Proctor took his leave. About a week after this arrangement had been made a friend

of Proctor's, who lodged under the same roof with him, was announced at West's house. The door of the study was opened with eagerness, and the visitor was seen advancing along the gallery with tears in his eyes, and with a countenance full of sorrow and dismay. He came to relate that poor Proctor was no more. He had suffered from no particular attack of disease, but his exhausted and languid frame had not been able to support the sudden reverse which the favour of the Academy had produced in his situation and his feelings. The unceasing agitation of his powerful mind had overwhelmed his strength, and he had died that morning. Such were the talents and such the history of Proctor. Who that feels for his country will not regret the instance that has just been related? Was Canova to be sought in Italy and Proctor to die unnoticed at home?

Art and Contemporary Life.

The artistic products of a race—the labours of the true artist (not the skilled workman or artificer, so often mistaken for an artist)—ought to a certain extent to instruct us as to the view of the external world taken by the race or nation to whom he belongs. Generally the artist must of necessity be influenced by the race for whom he works, even although by force of genius he may rise above and despise them. In so far as he is competent to observe the truth in the external world, and is permitted and encouraged to express it in his works, to imitate the objects of the external world with truth and fidelity, and last and greatest, to place on canvas or represent in marble, man, his thoughts, actions, and the grand expressions of the inmost workings of human sentiment and passion, and those sublime forms which nature (the great artist) at times displays for the admiration of mankind, so will art in his hands reach perfection, and the approving race be placed highest in the scale of humanity. The aim of all artists is or ought to be to reach the heart. Homer, Horace, Burns, Shakespeare and Pindar, by a few words. The skilled mechanic aims at a baser principle, but strictly human; he cares not for the heart but the reason, conscious that he addresses principles equally potent in human affairs; he asks us to turn from nature's landscape to the Italian garden; from the oak and cedar to his neatly trimmed alcove; from the Medicean Venus to the court lady of the reign of Louis Quatorze or of any other court, where the milliner and the *modiste* have succeeded in withdrawing attention from nature's grand outlines to the costly silks and velvets, the trimmings of gold and silver, the pearl necklace and coronet studded with diamonds of unknown value. It answers for a time, and the artificer's labours are declared to be beautiful—by the present generation. By-and-by a new race appears, and the finished works of the artificers of the past age are pronounced to be antiquated, wretched, intolerable and out of date. But why out of date? Is the virgin forest ever out of date? the Medicean Venus, or the Apollo? The paintings of Angelo, Raphael, Leonardo, Rubens, Teniers; the descriptions of Homer, Shakespeare, Horace and Burns? Never. They are the works of men who saw the beautiful and the true in nature, and represented it as it is. They worked for all generations. Fine art, like a lofty literature, is the test of the character of every race. They reveal to us the view the race or nation takes of the external world, its regard for truth in literature, philosophy and science. Without this innate feeling there never can be any lofty civilisation; for the race which substitutes utility for truth and beauty, which worships only the useful, can never be made to comprehend the truth. They create a world of their own and admire and worship it, and as they work only for the present generation, that which follows holds them in contempt. The goddess such races worship is utility.

Utilitarianism and Art.

A knowledge of many useful arts is essential to the existence of man, nor is it easy to imagine the possible existence of any race, or even tribe, totally ignorant of the useful arts. On the other hand, to perceive the absolute truth and to represent this in marble or on canvas, to place before the eyes of men correct imitations of what nature has created, is the highest of gifts. In proportion as the individual or race gives a preference to the objects invented by mankind over nature's creations, so will the taste of that individual or race be low, unintellectual and remote from truth; his sympathies with the living world have been thrust into the background by the mathematical and logical inventions of human nature; he traces all to utility, the goddess he worships, and boldly proclaims that nature herself in her inventions had utility in view. Without being aware of it he worships human reason, and denies that anything exists beyond it. By carefully noting the artistic efforts of a race we may arrive at a tolerably clear idea of the view that race took of the external world; now in that view are included the character and nature of the civilisation of the race.

NOTES AND COMMENTS.

NOVEL buildings are indispensable for an international exhibition that is to be a success—we might say for every sort of exhibition. If the Albert Palace, in Battersea, had been original instead of secondhand, there is little doubt it would have had a very different fortune. The French Commission of the exhibition of 1900 are assured of the value of novelty, but how can it be obtained when the Champ de Mars site, with its legacy of buildings from 1889 and the Eiffel Tower, must be utilised? The fine arts galleries belong to the artists, and although they prevent the realisation of a comprehensive plan, they may be used for a sort of supplemental exhibition. But the colossal machine hall, with the fine roof that competes with the St. Pancras Station roof, is more of an obstacle. It cost about seven millions of francs, and it would be sold at an alarming sacrifice, but nobody has the courage to bid. One railway company offered to take it, but declined to give a sou for it, as the cost of taking it down and removal would be equivalent to its value as a station. The only escape from the difficulty will be by using the hall for agriculture, forest industries, &c. The demolition of the Eiffel Tower (which cost seven and a half millions of francs to erect) would cost about three millions, so it is likely to be tolerated. It is estimated that in spite of the drawbacks the exhibition of 1900 can in area be made to exceed its predecessor by one-half. In 1889 23,000 mètres were covered; in 1900 the area will be 34,000 mètres. The examples of fine art will be shown in the Palace de l'Industrie, in the Champs Elysées, which will be enlarged for the occasion. The contributions of foreign nations will be arranged at the Trocadéro. An immense bridge will unite the two shores of the Seine. As it will be arranged as a "hanging garden," and will sustain as picturesque a building as can be devised, it will be one of the most attractive features of the exhibition.

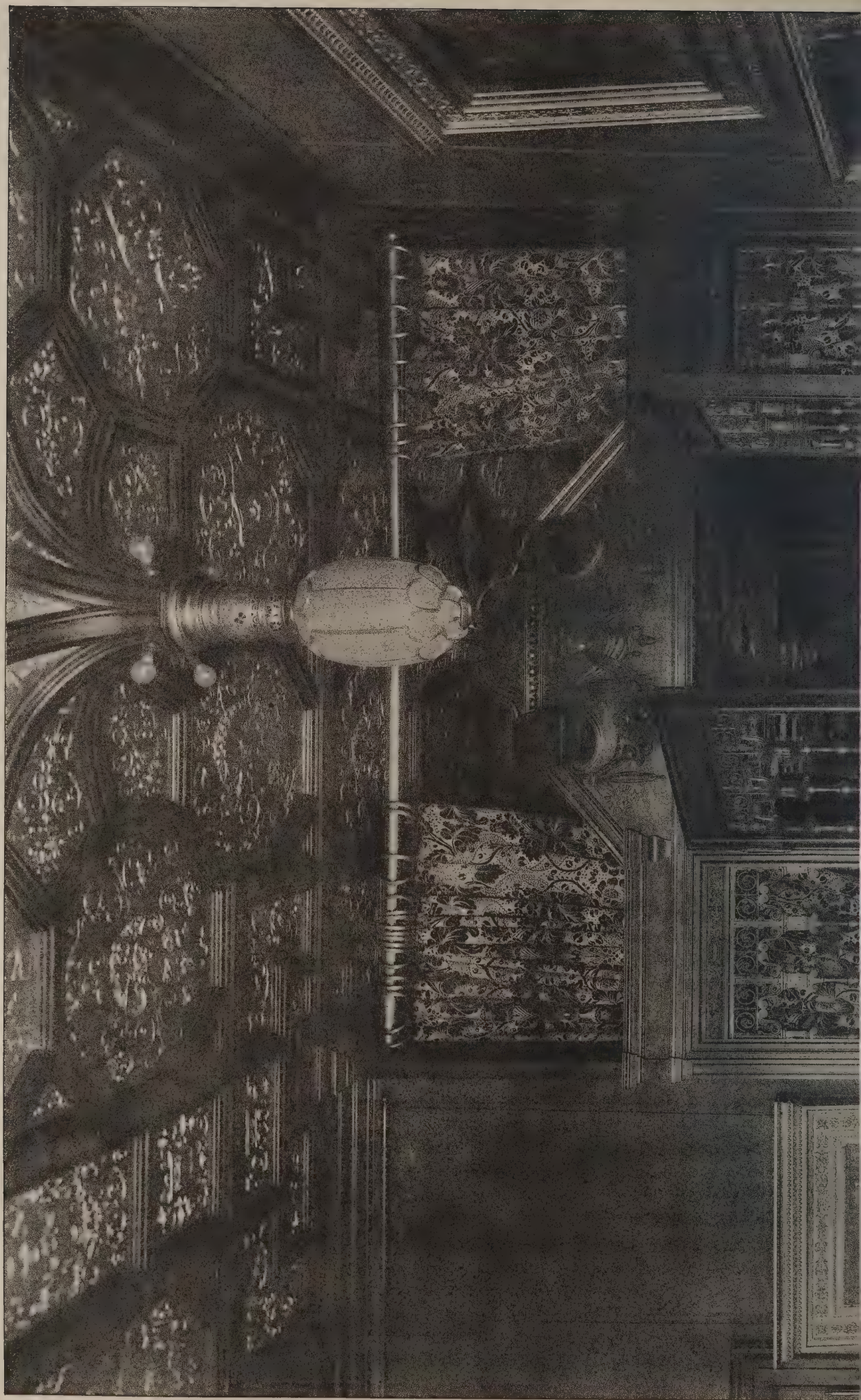
THE careful judgment which was given on Monday by Mr. Justice WILLS should be taken as a warning by anyone who imagines that the ancient principle, *caveat emptor*, is likely to be disregarded because sanitation is now considered to be a requisite in a habitable house. The defendant, in March, 1891, took a lease of a house in Harrow at a rent of 220*l.* yearly. He paid the rent for a year and a half, and then he sought to have the lease rescinded on account of misrepresentations about the sanitary condition of the house and the quality of the construction. Afterwards he abandoned the house. The defendant's excuse for refraining from lodging objections was that a promise was given to have the defects remedied. There was no doubt the plaintiff's son, who acted as agent in the transaction, did express an opinion that the house was well built and in a sanitary state. At the same time he agreed that any work which a sanitary engineer considered necessary should be executed, and that a certificate of sanitation would be given. The extra works were done about a month after the commencement of the tenancy, but by some oversight the surveyor's certificate was not procured. According to the learned Judge, the occupant of the house during the last six months of 1891—that is, in the first year of the tenancy—must have known "that the house was as bad as bad could be." The defendant and his family became very ill, and the cause assigned by the doctor was the dampness of the house. If the tenant then left the house and refused to be bound any longer by his lease, probably he would have succeeded. The law does not approve of dilatoriness, and by refraining from taking action until November 1892 he allowed his privilege to lapse. When action became necessary he employed surveyors, and of course the plaintiff imitated him. The evidence was so puzzling to the learned Judge that he was compelled to ask Mr. PILDITCH to make a special report. That document pointed out existing and contingent defects, and after reading it the Judge came to the conclusion that if the lease had been accepted on the assurance that the house was well built, and the notice to rescind had been given with proper promptitude, the right to rescind would be made out. Instead of an assurance, the defendant accepted the statement of the plaintiff's son, which was no more than an

expression of belief or of opinion. His lordship considered that the defendant had not succeeded in showing cause why his lease should be rescinded, but he was allowed a shilling-damages for the neglect to give him the surveyor's certificate. The case is not entirely satisfactory, but the result may be advantageous if people become convinced by it that the law will not always protect people who agree to live in unsatisfactory houses. If the defendant had obtained skilled opinion before signing his lease, he would have been spared illness, trouble, money, and—worse than all—the sense of suffering defeat.

It is reported from Pittsburgh that the Window Glass Workers' Association of that city have granted an application from the Chambers Glass Company for a loan of 50,000 *dols.* It is stated that this is perhaps the first case in which organised labour has been called on to lend money to capital. It should be gratifying to all except agitators and adventurers that for once labour has recognised that, if willing, it can occupy the position of a capitalist. The news will be unwelcome to the pinchbeck friends of working men, who for a short time have made positions for themselves, and thriven by disorganising the relations between what they invidiously term "labour and capital." We ventured to remark before this that the common-sense of our workers here and of others elsewhere would before long come to disregard the specious words and random promises of such friends, those whom BUFFON would probably have classified as belonging to the genus "vampire." The story of the impecunious syren who has acquired place and money by trading on the generous instincts of our workers, and has led them to give up their bread to their own and their country's disadvantage, cannot for ever charm the ear of practical working men. It is a good omen to see that the fallacy that capital is something antagonistic to labour is about to be exploded. It may be true that only with exceptional chances, and those chances rightly utilised, can an individual worker become also a capitalist. But hitherto under the misadvice of the self-constituted champions of labour, workers have been deluded and foregone the chances fully open to them in combination to exercise their power to be also masters of capital. Thrift, without any rigid practice of it, might involve a little self-sacrifice. This would be for all classes in the country distinctly preferable to strikes and railing against the minority who have acquired capital, and along with it anxieties and responsibilities that are ignored by agitators.

It is absurd to believe that picture dealers can be more infallible than their neighbours, for they have their weaknesses which can be turned to account by crafty and dishonest men. What is easier than to write on a scrap of stained paper—"To my dear friend T. HUNTER.—J. C."? Yet that scrap helped to convince dealers having the experience of Messrs. WALLIS that it was the dedication of a picture by JOHN CONSTABLE, and in consequence they offered 160*l.* 13*s.* for it in CHRISTIE'S rooms. It occasionally happens that a dealer allows himself to be cheated through fear his reputation as an expert will suffer, but after better acquaintance with their bargain Messrs. WALLIS wisely declined to pay the money, and their customers are likely to applaud their courage. They were not the first in the trade to be deceived. The vendor, Mr. POLAK, has been a picture-dealer in Manchester for fifteen years, and he gave 10*l.* for the masterpiece. Previously it was the property of other dealers. At one time the value placed on it was 50*s.* What price must have been paid to the unfortunate artist who was so well able to paint in CONSTABLE'S style as to deceive the most wary purchasers, and who had to impart to a canvas the appearance of age? Probably for all his artistic and chemical ability he did not receive a reward of 20*s.* The case ended by the plaintiff agreeing to take back his picture and to pay the defendants' costs, while all charges of fraud against him were frankly withdrawn. The picture has now a history which will impart value to it in the eyes of many amateurs. The case is a further testimony to the wisdom of SYDNEY SMITH'S resolve, which was never to pay more than 30*s.* for a work by a great master.

Die Architekt. Jan. 26th 1894.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

49 PRINCE'S GATE: DRAWING ROOM.

R. NORMAN SHAW, Architect.

INK PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.



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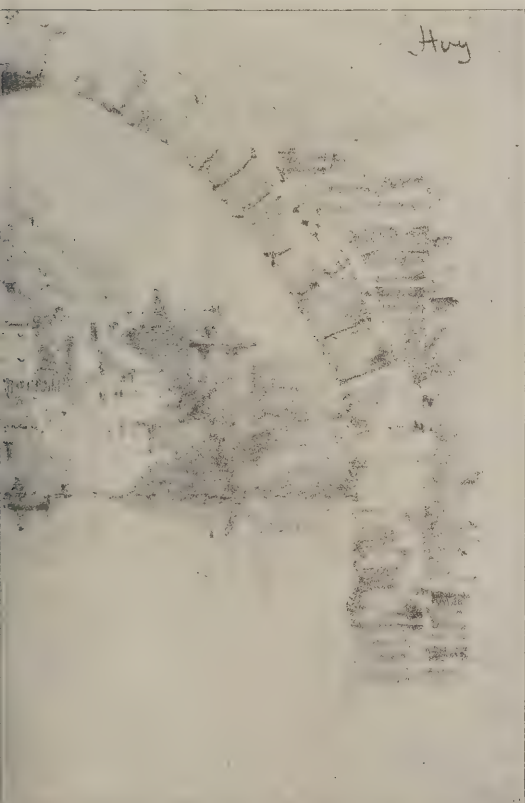
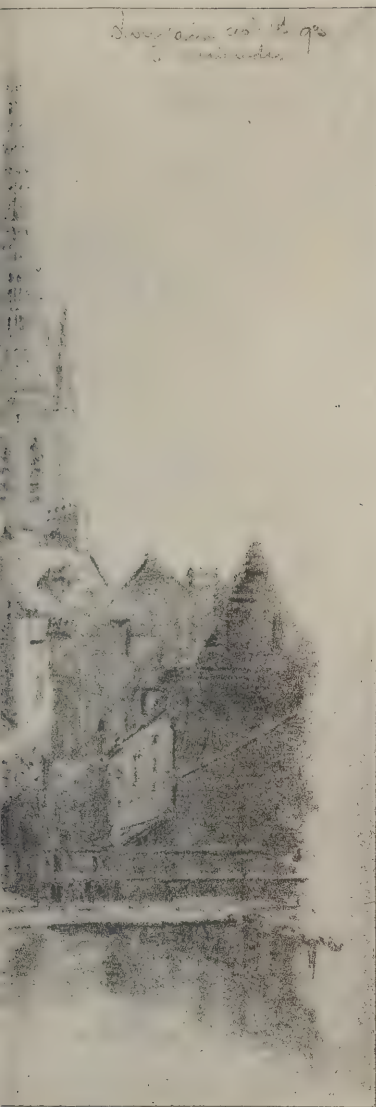
Jan. 26th 1894.



INX PHOTO SPRADUE & CO 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

LL AND STAIRCASE.

Jan: 26th 1894.



INX PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET, FETTER LANE E.C

BELGIUM.

AR. F.R.I.B.A.

ILLUSTRATIONS.

49 PRINCE'S GATE.
DRAWING-ROOM. HALL AND STAIRCASE.
(R. NORMAN SHAW, ARCHITECT.)

SKETCHES IN BELGIUM. (HUON A. MATEAR, F.R.I.B.A.)

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

The following gentlemen were elected new members:—Messrs. H. Astley, J. G. N. Cliff, G. H. Paine and A. H. Roe. Mr. J. DAYMOND read the following paper on

Wood-carving.

It was with much diffidence that I accepted the kind invitation of your committee to read a paper on "Wood-carving" to you this evening. I felt that it could have been placed in abler hands, but at the same time thought that I might place some facts and thoughts about wood-carving before the students of this Association, that, together with the practical illustrations, models, drawings, &c., before us, would prove both interesting and useful to them. Many facts that seem commonplace and elementary would no doubt be new to them, and my paper is, therefore, more particularly addressed to those who are studying for their profession than to architects in practice.

The craft of the wood-carver is of great antiquity; Egypt furnishes the earliest examples. To its dry climate and the care they bestowed on the preservation of the dead, we owe much of our knowledge of ancient work. In the British Museum are fragments of the wood coffin of Men-kau-Ra, a king of the fourth dynasty, and builder of the third pyramid of Gizeh, B.C. 3600, which has incised hieroglyphics on the face of the wood executed with much skill. The gilded wooden coffin of An-antef, a king of the eleventh dynasty, about B.C. 2500, has the portrait carved in bold relief on the lid, showing great ability of treatment. A wooden figure of Rameses II., from the doorway of his tomb at Thebes, compares very favourably with work of a much later and more modern period. There is also a statue of another king of the same dynasty in the collection. The examples of mummy cases for animals, notably those for the sacred cats, some carved furniture and animals used for toys, are all very interesting as specimens of ancient wood-carving.

The treasure-house known as South Kensington Museum contains a wonderful collection of wood-carving of many periods and climes. Scandinavian and Norwegian interlaced work of the tenth and eleventh centuries, bold and vigorous in its treatment. Some wooden shafts formerly supporting an organ of curious South Italian work, about the thirteenth century, whilst examples of fifteenth and sixteenth-century work abound, some of which we may note at random. The very fine oak doorway of the council chamber, Oudenarde, one or two panels from which are sometimes copied and placed by themselves in a wilderness of plain surroundings, giving a starved effect, utterly different to the rich massing of ornament so conspicuous in this and other examples. The exceedingly bold treatment of the overmantel of chimney-piece from Bruges is worthy of notice. The altar-stall from St. Denis is extremely light and fine in its detail. The boldly-carved doors with elaborate canopies and carved statues from the portal of the cathedral at Aix, in Provence. The sedilia of Ulm Cathedral is one of the finest examples of South German carving, whilst the examples of furniture, cabinets, frames, carriages and screens are so numerous that we must pass them by. They are accessible to all, and the humblest craftsman can study at leisure there the finest specimens of his handicraft. The panelling from a room near Exeter, 1600, is worth noting, while the collection of English work of the seventeenth and early eighteenth centuries is becoming very large, and contains many very fine examples. Some capitals from Drapers' Hall show the method then in vogue of building up the work. Our own churches and mansions contain fine examples of wood-carving in screens, stalls, roofs, &c., from the fourteenth century through the Elizabethan period to the time of Grinling Gibbons, whose examples of unparalleled technical and artistic skill are to be found scattered throughout the country, also in St. Paul's and many of our City churches. It was our good fortune to have an opportunity of studying the carving in the choir of St. Paul's a short time ago, for a room we were carving in the style. I only wish that the choir were more accessible, for it is a perfect mine of wealth in design and execution for the wood-carver. Gibbons died in 1721, but his school influenced wood-carving down to the middle of the eighteenth century. Country and town houses abound with acanthus carvings to doorways, chimney-pieces and other fittings, executed in a fine though unpretentious style with a masterly hand. Every cut of the chisel or gouge tells, and these enrichments were executed

by craftsmen without hesitation, and can be carried out with considerable rapidity of execution. But it is not my purpose to deal with wood-carving historically, so I will pass to the practical part of the subject at once.

The wood for carving should be the best of its kind, free from knots, shakes or other defects, as the specification always mentions, well and naturally seasoned, that which is baked, steamed or seasoned by any artificial means being harsher and more brittle under the tool, or, as the carver says, "without any nature in it." Unless the work is small in detail, the wood should not be too hard to produce the best results. Take oak, for example; if the wood has hard fibres running through it, like most of the American species, it is much more difficult to work, and prevents one using their tools with freedom. Figured woods, again, most of which figure is produced by the change in direction of the fibres, are difficult to finish. The carver has to continually change the direction of his tool, which prevents those happy effects and twists on the face of a piece of foliage or ornament, which seem to suggest themselves naturally if the course of the tool were not impeded by the different directions of the grain. (Some specimens of wood on the table will explain this better than words.) To obtain clean-cut work the carver must cut with the grain, much as a boy who whittles a stick with his knife or a joiner planes a board with his plane. The piece of padouk has been faced with a metal plane, a cut has afterwards been made upon the face with a flat gouge; you will see that one-half of the cut is clean, whilst the other is against the grain. The piece of mahogany has also the same defect, which increases the difficulty of cutting the work clean. A piece of carving cut against the grain is seldom satisfactory; it can be done, but to dig a piece of ornament out of the end of the grain is a very vexatious proceeding, and withal expensive. Take a simple illustration:—An impost cap, carved with egg and tongue, if worked by the joiner in the solid, the returns are end grain, and the ornament must be cut against the grain or fibre of the wood.

A piece of good Riga wainscot is the best wood for architectural carving (but it is now very scarce, and the Hungarian oak is the best substitute); the grain is not too strong, and one can deal with it with more freedom than any other wood. Mahogany is very variable. Some kinds are very good, others very indifferent, the Mexican and African, for instance, cutting very much like cork—that is, it will not stand against the tool. The harder kinds of Cuba and Spanish mahogany are rather more expensive working, especially if figured. Teak is a good wood for carving; it wastes freely, or perhaps we should say the surplus wood is easily removed and the work shaped readily. Another advantage possessed by teak is that when used for purposes where the material is cut away more in some parts than others—as, for instance, an animal terminal or very bold panel out of 6-inch or 4-inch plank—it is more likely to stand than some of the other varieties of wood. Its only fault is that the grit in it dulls the edges of the tools rather quickly. Walnut is a fairly good wood for carving, the American being the easiest to cut. The English is very close and firm in the grain, and some of it is very hard. The American walnut is rather remarkable for showing a whiteness on the surface of the wood after it is finished, if viewed in certain lights. On turning the wood round the whiteness is reversed; this, of course, disappears if the wood is polished. Italian walnut carves very well if straight in the grain. Satinwood carves well, and, being light in colour, the work is effective. Pine is less expensive to carve, but it is easily damaged if used for undercut work. Lime tree is a splendid wood for carving, but so perishable that one can only recommend it for temporary use, such as patterns for metal casting, for which it is admirably adapted, although some founders prefer mahogany for that purpose. Kawrie pine cuts well, but has the reputation of shrinking lengthwise in addition to across the grain, a fatal defect for joiners' work that cannot be provided against. It is quite enough to have to contend with the ordinary shrinkage in wood without the shoulders of framing showing an open joint when the work is finished. Some samples of bass or American white-wood cut well, some very badly. English cedar and pear tree are also good woods for carving. Pitch-pine is unsatisfactory; the darker portions of the fibres are hard to work; it develops shakes when the wood is cut into, and if very dry it is harsh and short under the tool. In fact, pitch-pine and yellow deal are nearly at the bottom of my preference of woods suitable for carving. Sequoia (the red wood from the mammoth trees of California) is simply bad, and it is well-nigh impossible to get any life into the work. It cannot be cut clean across the grain, and dulls the tool almost immediately. Cork is almost preferable. Most of the Australian woods, yarra and others, padouk wood from Burmah, are all very indifferent for the use of the wood-carver.

The tools next claim our attention. They require to be of the very best steel and well tempered. The shapes seem to have varied very little through the centuries; some found in the Pyramids, and now in the British Museum, are similar in shape, but made of copper or bronze, to the tools of the present day.

A wood-carver requires a set of flat gouges from $\frac{1}{4}$ inch wide to $1\frac{1}{4}$ inches; a set of quicker section gouges, called "fluters," though used for many other purposes than fluting; some flat tools of varied widths called "firmers"; small quick-section gouges known as "veiners," though the less they are used for putting veins on the faces of leaves the better for the appearance of the work. V-shaped tools, called "parting tools," are also necessary. Besides all these, a certain number of similar tools, but bent instead of being straight, are required. These are necessary to take up the cutting in the hollows or undercuts where the straight tool would stick into the grain of the wood. There is also a variety of tool known as the "macaroni," which is of doubtful utility for ordinary work. A set of oil-stones ground to fit the various sections of the gouges and called slips is indispensable; a leather strap prepared with tripoli, similar to a razor strap, for putting a fine edge on the tools after sharpening with the slips is also necessary. Small wheels are used to clean out the inside or concave surface of the bent tools. A mallet of wood, lead, or iron, bench screws, clamps for holding the work and a pair of compasses, make a fairly complete list. All wood-carvers' tools require to be carefully sharpened, and kept in good order, if the work is to be cleanly and well finished. We may note that the tools are generally sharpened by rubbing both sides, and not as joiners' tools with cutting edge at one side; for soft woods the tools must be sharpened at a more acute angle than for the harder varieties. To distinguish the tools from one another as they lie upon the bench, the carver uses wood of various colours and shapes for the handles of them. Those not in use are generally kept in a small chest containing a quantity of small drawers or trays. On the table are specimens of carvers and joiners' tools, showing the different methods of sharpening. The bench must be kept free from grit if we wish to preserve a good edge upon the tools.

The simplest and most inexpensive kind of wood-carving is that in which the outlines of the design are first set in from the face of the wood, and a gouge or other tool then being used, to make a sloping cut to meet it, thereby taking out a chip or piece without leaving any rough places or awkward corners to be cleared out afterwards. This description of ornament is used very frequently on Jacobean furniture and old chests; some spandrels of the Gothic period are also examples of this kind of treatment. The faces of acanthus leaves in the enriched mouldings and some of the capitals of the seventeenth and early part of the eighteenth centuries are also worked in a similar fashion. This treatment obviates grounding out the ornament, which must be done in ordinary work, such as a spandrel or panel showing a background.

We will now describe the method of carving an ordinary panel or spandrel. The joiner has rebated the wood all round to the depth of the groundwork for the carving; if it is a large panel he has glued it up, in this case taking care to put the tongue in joint far enough back to prevent us cutting into it; a precaution which, I am sorry to say, is not always observed, to the obvious detriment of the work, especially if the cross tongue is of deal in a hardwood panel. We sketch or paste a tracing of the design to be carried out on the wood, and proceed to cut away the parts that are to be the ground of the panel, afterwards using a tool known as the "Old Woman's Tooth" to rout out the wood to the required depth. Care must be taken during this part of the work that no cuts made by the chisels or gouges in forming the outline should go below the surface of the ground. In hurried work this is a very common occurrence, and frequently shows much if the work is afterwards polished. This seems a very mechanical proceeding, but it is the general method; one reason is that when the face of a piece of wood is roughly cut away it is difficult to sketch upon, therefore the carver likes his outline set in first, that he may be able to keep to his design. When the panel is grounded, the finest skill of the craftsmen is called into play to balance the masses in the design, decide the parts that are to be in high relief, in contrast with those near the ground, and generally to arrange the projections so as to produce the best effect. In fact, this part of the work tests the ability of the workman to the utmost degree, and shows whether he is a skilled craftsman or merely one of those who, unfortunately, never seem to be able to master their craft, and always require a model or copy, which they reproduce with more or less success. After the panel is roughed in, if possible, it is advisable to put it on one side for a short side; it is good for the material, for, after cutting away one side of a piece of wood, it is well for it to be laid by. It is also frequently good for the design; when taken up again to finish the work faults are less likely to be overlooked than if the carving is finished off without interval. The outlines are generally cleaned up first, then the ground finished to them, the face of the work being the last part to receive our attention. Here, again, the craftsman has an opportunity to show his ability, or otherwise. The groundwork of panels is sometimes stamped to give a matted effect and bring out the ornament, but it is not a desirable treatment, giving a common appearance to even good work. The best finish for

the ground is that of a slightly undulating but smooth surface.

We will next take a length of moulding, egg and tongue or leaf enrichment, for example. First space out the ornament, then mark the outline upon it and set it in as we did with the panel. The groundwork is next picked out and the face afterwards carved, the more projecting parts being finished last. If egg and tongue, the shell is set in, the egg shaped and finished, the tongue being carved afterwards. We may remark here that full-sized sketches of egg and tongue or other mouldings as given us are often very deceptive. The enrichment is generally drawn on the moulding in elevation, probably looking fairly broad or otherwise in correct proportion, but when developed on the actual moulding it becomes quite different, and really works out very much narrower than was expected. If these sketches are set out for short breaks, it is evident we must either alter the arrangement or execute the work to a different proportion than that shown or intended. Gothic strings and space ornaments are sometimes cut in the solid and sometimes applied in both old and modern work. If applied with an intervening space between the carved portion and the cavetto background, there is a lightness of effect and more shadow than can be obtained if they are worked out of the solid stuff. The section for a carved moulding is an important point; if it contain deeply-sunk hollows the carving must be done with bent tools, which increases the time required for its execution. The model for an architrave similar in section to those at Hampton Court Palace, but with simpler detail, is a good example of its kind; but flatter sections are much more economical to work.

Capitals generally should be prepared with the grain of the wood vertical for carving. If the grain is horizontal, as for Ionic caps with angle volutes, they must be glued up at the mitres or angles, otherwise two sides have to be carved endwise in the grain. If the caps are of any size they should be built up. Take a Corinthian cap, for instance: a good method is to glue up the bell in sections with angle and centre scrolls in the same pieces of wood; if for a column, have the bell turned. The scrolls and husks can then be carved and well undercut, or pierced if preferable; the lower tiers of leaves being absent, there is more room to get at the undercut parts. The leaves for lower part of cap are shaped and carved separately, being afterwards glued on and screwed from the back or inside. It is also convenient to build up the abacus in pieces, and if properly put together with dowels and well screwed to the cap, the whole will stand better than if cut from a solid piece of wood, even if such could be procured large enough for the purpose. The Corinthian caps on the choir screen at St. Paul's Cathedral are built up in a similar fashion to that just described. If the caps are executed in the solid, the probability is that roughing-out and exposing fresh parts of the wood to the action of the air will cause the outer parts of cap to shrink rapidly, so that splits or shakes develop themselves, which, after a time, may or may not close up again. It sometimes happens if the shakes are filled up they will split up the cap, acting as wedges when the inside parts of the wood shrink.

The endless or band-saw and fret-cutting machine are valuable aids to a wood-carver when the outline can be cut or pierced before the work is shaped or roughed-out—cresting or tracery for instance. The small terminals on the table will demonstrate this. One is as it comes from the saw, the next with the superfluous pieces knocked away and the third roughed out. This method is sometimes adopted for work with a background, especially if in high relief; the outline of design is cut with the saw, being afterwards glued upon a background and well screwed from the back, or, if for painted work, fastened with fine nails or brads from the face as well. The carving is sometimes done before and sometimes after being placed on the background. By this means the operation of grounding is saved, but the perfectly level background is not so artistic-looking as the slightly undulating one produced by the first method described. It is almost needless to say that the design must be thoroughly thought out before the fret-cutting is begun. The large console on our left was cut to the outline before being carved; the surplus wood is thus easily removed; it is then roughed out, and afterwards finished as described in the case of a panel. The enriched three-quarter column was first made out with deal to complete the circle, then turned and carved. The mouldings forming the cornice and those round the panel in satinwood were prepared with the aid of machinery, then mitred up and fitted by a joiner, the joints carefully marked and protected; the pieces are then carved before the mouldings are glued up, the mitres being finished off afterwards. The wood-carver always prefers his work in small pieces; as a rule, he lays and fixes it on the bench before him, whereas the stone-carver, if possible, puts his work up in front of him. It is rather remarkable that in those cases where the craftsman is both a stone and wood-carver he puts the stone up in front and lays the wood down before him. The explanation is that the stone-carver does

most of his work, even when finishing, with a mallet or hammer, whereas the wood-carver, hampered by the grain of the wood, has more power over and a freer use of his tools by having the work below him.

Wood-carving executed *in situ* is always much more expensive than if done on the bench before the work is put together. Cutting tracery is part of the wood-carver's craft, though it is often left to the mercies of a joiner, who gets as much as possible done by a machine, which takes all the spirit out of the cusps, the pockets and mitres being sometimes wonderfully and sometimes fearfully worked afterwards. Simple quatrefoils on the table show the difference in the appearance of plain cussing when worked by hand and by machine. Those worked by hand stand up and have a crisper effect than the one taken off to a dead level by the machine. The slightly-varied section of the moulding as worked by hand is also better looking than the mechanical hollow which runs with unfailing regularity through the machine work. While speaking of tracery we may mention that amongst the small models will be found some examples of carved cusps and terminations. An interesting branch of wood-carving is the preparation of models for metal-work. These, if very small, such as bows for keys, are made of boxwood, the larger patterns of lime tree, pear tree or mahogany. This work requires considerable skill and judgment in order that the pattern may lift from the mould without damaging it. All undercuts must be avoided, and the effect obtained without them in ordinary work, for obvious commercial reasons. It is often necessary to make the pattern in several pieces in order to draw it out of the mould. They are sometimes cored or worked out at the back to the thickness of metal required and sometimes solid, at the discretion of the founder. There are some examples of patterns before us: that for the hob of a grate was made for a fireplace exhibited at the late Arts and Crafts Exhibition. The terminals were for the gun-metal gates at the New Gallery. There are also some patterns for a tomb railing and parts of a monument prepared for execution in bronze. Into the province of designs for wood-carving it is not my intention to enter, but it is desirable that they should be worked out on paper, or a model made, that the craftsman may cut into the wood without hesitation, or as we say, "without having to feel his way." He should be able to mentally see or imagine the effect of his work when finished, before or whilst roughing out the subject. Figures always require modelling before being carved, unless they are to be in very low relief, in which case a skilled carver can produce good effects with the aid of a careful drawing.

The spandrels of which a set of photographs are exhibited were executed in this way. The plaster models for figures, animals and ornament exhibited have all been prepared for wood-carving. The angels with instruments, labels, &c., on screens were executed in mahogany for the reredos shown in the photograph below them. On the table are models for stall terminals, heads for seat elbows, some animals for staircase newels, also carved drums for columns, and other architectural features, some in wood and some in plaster. Specimens of old work are also on the table. In the fifteenth-century panels from Sedburgh Church the treatment of the face of the sacred monogram should be noticed. Two carved stair-ends, date 1790, are similar in design, but show just sufficient variation in treatment to mark them as handicraft, and not machine or cast work. Some casts of small spandrels from an old screen at Hayes Church, Middlesex, should have been here; there is a photograph of an inlaid and carved table, the date 1605 being worked in inlay on the frieze. We might mention that the church, so near London, is well worth a visit, the fifteenth-century roofs remaining in nave and aisles; there are also some good brasses, a fresco-painting, the old timber porch, and other interesting features still to be seen. Concerning polishing, as a rule some polish is required to protect wood against changes of temperature, and to keep it clean or bring out the colour. If left from the tool or plane some woods soon show the dirt very much, especially in this city of ours, and therefore some protection is necessary. But let there be as little polish used as possible. It is generally applied with a brush, and needs great care, for at the very best it spoils the appearance of the carving, for a time at least, and certainly in no case does it improve the work. It is generally disappointing when one sees their work for the first time after being polished. Teak is a satisfactory wood from this point of view, it being a good colour and standing well without polish. A good treatment for oak is to have it fumed in a chamber with ammonia, afterwards finishing with wax polish.

Just a word respecting apprenticeship. Unfortunately, it seems to be going out of fashion in this as in other trades and crafts. Personally, I do not think anything can take its place entirely. The technical schools are invaluable as aids to the young wood-carver, but cannot altogether substitute the training to be received in a shop; the experience gained upon actual work is not to be obtained in any other way. The present system is that lads try to become attached to a shop as improvers, with a tacit understanding that, if they are industrious

and behave themselves generally, they will be retained on the general staff of workmen. There is a certain advantage in this plan: that the lad knows that he is liable to dismissal if he does not behave himself, and further, that the more interest he takes and the better craftsman he becomes, the more it is to his employer's advantage to keep him.

In conclusion, we would urge that architects should always retain some control over both the quality and prices for wood-carving. In many cases this is done to the obvious advantage of the work, but in others it appears in the quantities included, perhaps in so many feet super of framing or doors, all to be executed as detail at end of bill, which said detail gives a very indefinite amount of information, thereby making the carving quite a negligible quantity until the full-sized drawings appear, when the architect's requirements, the builder's provision for cost and the carver's views of the matter are far as the poles asunder. In many cases it is impossible to do justice to the work and the result is painful to all beholders. Wood-carving to be done well must be paid for, therefore it seems to me that some control should be kept over the price as well as the quality of the work. I must now thank you for the kind attention given to my paper, hoping that the remarks may help to excite some interest in the subject and that it may be understood that there are some earnest workers in the craft, though their productions are often sadly handicapped by the limit of prices, quality of material, the multiplicity of styles that there are used, and wherein the conditions of work in the present day differ so much from those of the old craftsmen, in whose time a style came into existence, was developed and died out in a kind of natural evolution, whereas now it is one period to-day and another to-morrow. But if the craftsman bring some study to bear upon his work and strive to produce the best that is in him, surely his productions should have something of true craftsmanship about them.

A vote of thanks, proposed by Mr. Pite and seconded by Mr. Bolton, was passed by acclamation to Mr. Daymond for his paper, and the meeting adjourned.

GLASGOW ARCHÆOLOGICAL SOCIETY.

AT the meeting of this Society last week, in the hall of the Philosophical Society, Dr. Alexander S. Murray, of the British Museum, lectured to the members of the Glasgow Archæological Society on the Subject of "The Tomb of King Mausolus and its Attempted Restoration." Professor Ferguson, of Glasgow University, presided, and there was a large attendance. The lecturer gave a minute description of the tomb, which, he said, had been characterised as the eighth wonder of the world. Referring to King Mausolus, he said that history bore out that he was a rather oppressive monarch. References to the tomb in ancient literature had tempted some of the greatest English architects to sketch a restoration of it. Even Sir Christopher Wren, despite his many other activities, found time to undertake such a work. The lecturer also spoke of similar efforts by several of Wren's successors. Dr. Murray was cordially thanked for his address.

LINLITHGOW PALACE.

AT the meeting of the Architectural Section of the Glasgow Philosophical Society, held on Monday night, the president, Mr. Campbell Douglas, architect, in the chair, the hon. secretary, Mr. A. Lindsey Miller, read a paper, "Notes on the Palace of Linlithgow and Church of St. Michael." In his remarks he drew attention to the close association of Linlithgow with the early history of our country, lying, as it does, on the verge of Scotland's battlefields, and also from being the favourite residence of the Stuarts. Here, in 1301, Edward I. fixed his winter quarters during his expedition into Scotland to reduce the Scotch, and built what Barbour calls a "Peel." During the time of Bruce the castle was taken by stratagem. The king reduced the fortification. The minority of James III. was passed in the palace, and Henry IV. found refuge when dislodged from the English throne by Edward IV. From Linlithgow James IV. started on the fatal expedition to Flodden, and in 1542 Mary Queen of Scots was born there. The connection of royalty with Linlithgow closed with James VI., and in 1746, while a body of Hawley's Dragoons were lodged in it, the palace, through their carelessness, was burnt. The church of St. Michael, which stands near the palace, is first noted in the twelfth century, being dedicated in 1242, and about the time of James III. would probably be complete. It has been added to and altered at different times, but it is still considered the most important specimen of an ancient parochial church existing in Scotland. The paper was illustrated by numerous limelight views, taken by the lecturer, and at the close a vote of thanks was accorded him for his paper.

THE BUILDER'S ART IN CHINA.

CHINA is generally regarded as the land of "topsyturvydom." In nine cases out of ten its inhabitants arrive at any given result by adopting a course directly opposite to that pursued amongst ourselves. Thus the leaves of their books are open towards the sewing, and double at the outer edge. The workman draws the plane towards him in place of pushing it from him. The candlestick fits into the bottom of the candle instead of *vice versa*, and so on. Instances might be cited indefinitely, and in a good many respects the art of building follows the same lines. Whether its professors can teach westerners many useful lessons may be doubtful, but there are undeniably a few hints to be gained from a study of even the much ridiculed Celestial architect's way of doing things.

It is somewhat singular that a country possessing so long a history, and here and there monuments of such undoubted antiquity, should combine with the latter so general an appearance of modernism in its ordinary public and private buildings. There are no architectural ruins in China. The fact, however, is easily explained. Stone, the least perishable of all the building materials in ancient times, or brick of the sort which hardens rather than crumbles by exposure to the weather, has never been employed by the Chinese, save for buildings connected with fortifications, bridges, mausoleums, or pagodas and temples. Owing, no doubt, in part to the fact that the tent pattern for every description of dwelling was originally adopted, and has never since been departed from, and to the further fact that no Chinese potentate has ever attempted to raise enduring monuments in the shape of palaces or public buildings, original design has been cramped. Nor for the past few hundred years has any inventive genius manifested itself amongst the people. Innovation has been sternly repressed by the teaching which holds the imitation of the past the highest value. That invention once held its own is, of course, undoubted. But somewhere about 300 years ago the then condition of affairs appeared to crystallise, and China has ever since remained *laudator temporis acti*.

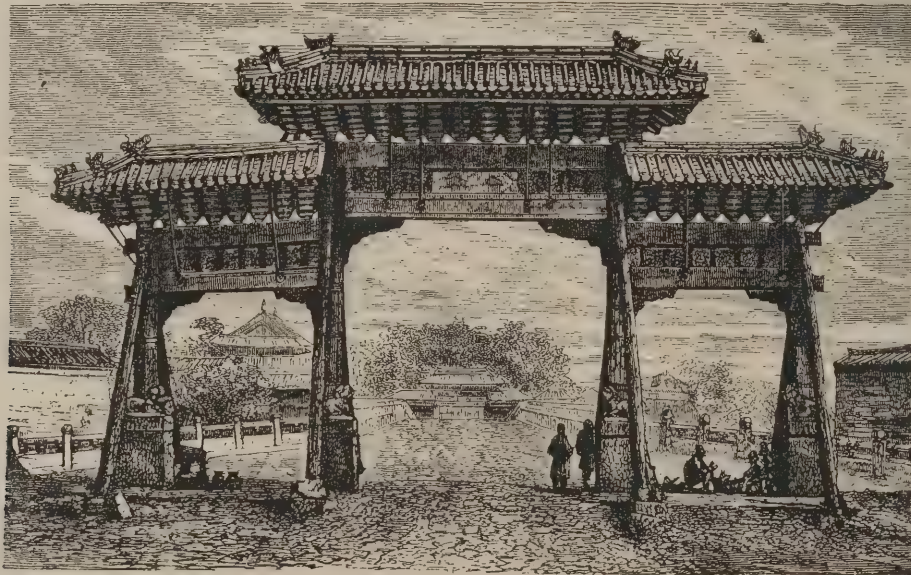
Before dealing more especially with the ordinary buildings of the country, a few remarks concerning the more substantial erections may be of interest.

length of bridge is required, stone piles are erected at about 30 feet distance from each other. Upon these are laid large round beams, across which planking is nailed. Earth is then placed on the latter, and the top is paved with brick or stone. Such erections naturally decay rapidly, but the stone pavement often comprises blocks of very large size. At Changchow-fu a bridge of this description carries granite stones of 24, 33 and 45 feet in length by 2 in breadth.



CHINESE BRIDGE.

A conspicuous feature of the landscape in most parts of China is the misnamed "Triumphal Arch," its sole resemblance to the European erection so called being that it is simply a commemorative monument, in honour of distinguished personages, or of parents, or even women who have exhibited some special virtues. Many are built of wood, but the more important ones of stone elaborately ornamented with carvings. The tile



PAI LO, OR TRIUMPHAL ARCH.

The Arch and Bridge.

A somewhat curious fact strikes the inquirer at the outset as regards the use of the arch. That for many ages the Chinese have been well acquainted with its construction is indubitable, but they make comparatively little use of it. A sufficient number exist, however, to show that they are able to construct them of any desired shape—semicircular, pointed, or horse-shoe, the transverse section of an ellipse, or even that of the Greek omega, the span being widest at the top. They are, however, in nearly all cases single; the idea of a succession of them to form a bridge, such as those over the Thames, seldom having occurred to the designers. In the illustration above given, the stones for the arch are cut in segments, each end carrying very short tenons morticed into transverse blocks of stone stretching across the bridge. The segments decrease in length from 10 feet at the spring to 3 feet for the vertex-block or keystone, the latter being also morticed like the rest into two transverse stone blocks. Owing to the disposition of the strains, European engineers pronounce this arch to be unfitted for supporting great weights. When a considerable

root usually added gives them a top-heavy appearance, but they form conspicuous and quaint additions to the surrounding scenery.

Fortifications.

No notice dealing with Chinese masonry would be complete without some allusion to the celebrated work known as the Great Wall, remarkable alike for its solidity and its length. It extends for a distance of 1,500 miles, crossing plains and valleys, and climbing the steep sides of mountains. Across the valley it consists of a square crenellated wall, such as surrounds most Chinese cities, about 32 feet in height at the level parts, decreasing to 10 or 12 feet when commencing the ascent of a precipice. Here, in some places, it assumes a step-like elevation, the stone used being limestone and porphyritic granite, cemented together with chunam. Most of the portions crossing the more lofty spans are of triangular section, from 15 to 25 feet in height, with an average base of 15 feet. The apex consists of a single layer of stone, about 8 inches wide, thus permitting the ambitious traveller to sit astride it. Towers are placed at every sixth of a mile, but are

mostly in ruins, though the wall itself, dating back for over 2,100 years, is still in good preservation. Its chief interest, from a constructive point of view, lies in the extreme hardness of the mortar used, which almost defies the pickaxe or crowbar. The close joints and mortices of Egyptian ruins are never found in China.

The ordinary forts are generally mere earthworks, but those of a fortified city like Pekin are of wood, built upon the encircling wall over each gateway. This wall is of fine dimensions, 22 to 55 feet wide, perpendicular on its outside front, with the inner side sloping. Parapets are erected on both the inner and outer faces of the wall, that on the latter being loopholed and crenellated. At intervals of 50 to 60 yards are large buttresses, every sixth being of much larger size than the others. The smaller ones are about 15 to 20 feet square, and all are parapeted like the rest of the wall. Part of the inner portion having fallen away, the writer was enabled to observe its construction. Near the gate the walls are occasionally faced with stone, but in other places with immense bricks almost as hard. The space between the facings is filled up, firstly, by a solid foundation of concrete, some 10 feet in depth; then by a layer of well rammed earth of about the same thickness; another layer of concrete and another of earth succeed, the latter being paved with large blocks of granite, which form the *terre-plein*. The concrete resisted all the efforts of our sappers to form a trench on the *terre-plein* during the last war.

Each of the gates has a buttress on either side, connected by a semicircular wall, which thus forms an *enceinte* with a central gate. The arches of the gateways are well built, and above each gate is one of the pagodas above mentioned. They are three-storeyed and fitted with numerous port-holes, through which project the muzzles of the defending guns.

Forts in some places, especially those on the Pearl river, are built of stone with embrasures, and the guns mounted *en barbette*. The whole science of fortification is, however, in a very elementary state.

Mausoleums.

Just as the coffin and funeral ceremonies are deemed of supreme importance in Chinese eyes, the erection of a suitable mausoleum has frequently been an object of Imperial attention. The most celebrated in the country is known as the Tombs of the Thirty Mings—the dynasty preceding that now on the throne—and are situated about ten miles within the Great Wall, north of Pekin.

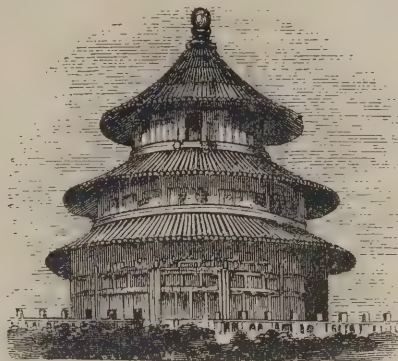
After riding over some rather rough ground, the traveller passes through three of the triumphal arches above described, and comes upon an avenue about two-thirds of a mile in length. On either side of this are sculptured figures of animals and men of colossal size, and distant about fifty yards from each other. The figures comprise six kings or priests, two horses, two griffins, two elephants, two camels and four lions. Passing these one reaches the largest and most celebrated of the tombs, that of Yen-Wang. The shrine is in the centre of an immense hall, 220 feet long by 92 feet 8 inches broad, and supported by thirty-two pillars, exclusive of those in the walls. Each pillar is 11 feet 4 inches in circumference and about 60 feet high. The ceiling is in good preservation. It is noteworthy that the trees to form the pillars—each consisting of a single piece of wood—were all brought from Burma just 250 years ago, China not producing any suitable timber. A second building, containing the coffin of the deceased emperor, lies about 50 feet behind the great hall. It stands upon an immense brick mound pierced by a long, sloping tunnel, which has a most remarkable echo, and is, moreover, a whispering gallery. The above description will suffice to show the style of building.

Pagodas and Temples.

No Chinese landscape appears complete to the average western eye unless a pagoda figures prominently therein; and it is not probably going too far to say that these buildings are the only ones of even moderate antiquity in the empire. Those most familiar to foreigners (the first and second Bar Pagodas at Whampoa) date back to 1598 and 1621 respectively. That opposite the gate of the British Consulate at Canton was built in the year 537 A.D. as a shrine for a relic of Buddha. Its original height was about 295 feet, and ten centuries after its foundation a pinnacle of gilded copper surmounted by a golden ball was added to it. Time and weather have, however, destroyed the upper portion, about 180 feet of nine storeys only remaining. A winding staircase gives access to the summit, but was so constructed that in place of being carried up through the interior shaft it was led from one storey to the next, so that in order to make the ascent it was necessary at each storey to pass through a doorway upon a platform carried round the exterior, and after walking round half the circumference, to re-enter at a doorway opposite, whence the staircase again led upwards. Owing to the ruinous condition of the pagoda and the rotting away of the platforms, the ascent is now impracticable. Passing birds have planted the seeds of large

trees on the ruined summit, which thus presents a singular appearance.

The well-known porcelain tower of Nanking was, perhaps, prior to its destruction by the Taeping rebels in 1863, the most



DOMES OF THE TEMPLE OF HEAVEN.

celebrated structure of its sort in the world. The external bricks were composed of coarse porcelain with a white glaze on the outside surfaces. It must have been an imposing looking building.

Temples.

One of the oldest buildings in the country is the Mohammedan Mosque at Canton, founded A.D. 850. It consists of a plain hall, the roof and pillars of which are in ordinary Chinese style, but in which the severe simplicity of the interior contrasts forcibly with the decorations of a Buddhist temple. The arches, forming two sides of the building, denote its Arabian origin, but it was, of course, executed by Chinese. A minaret at the side is 120 feet in height. Legend ascribes an antiquity of some 2,000 years to many of the temples at Canton and elsewhere, but there is little proof in support of so ancient an origin.

The general plans of most Chinese temples are alike so far as space permits. The following description of the celebrated temple at Honan gives a fair idea of the general arrangements. Passing from the landing-place through an unpretending doorway, an avenue bordering a pathway paved with granite is entered, leading to a square building forming a double gate with two colossal figures standing within the porch. Another small court and a third gateway have to be passed before the great inner quadrangle is reached. Here in the centre of the grassy enclosure dotted over with magnificent trees rises a platform supporting the great hall of worship some hundred feet square, in the midst of which tower the tranquil images of the past, the present, and the future Buddha. In front of these gilded figures is an altar of richly carved wood. On both sides of the hall are ranged the images of the eighteen Lo-Han, or apostles of Buddhism; and small tables covered with embroidered cloth serve as lecterns for the priests.

Another large hall, in the rear of the first, contains the image of the Goddess "Hearer of Prayers," and still further on, in the midst of a gloomy sanctuary, stands a pagoda sculptured in white marble, 30 feet in height, the gift of a former emperor. This item of decoration is, by the way, rarely seen in similar buildings. On both sides of the great quadrangle are long ranges of buildings intersected by courts and corridors, which constitute the apartments of the priests. A large hall yet further to the rear answers as the refectory. This opens on to a spacious garden, with fish ponds at the end. Beside the fish pond is a small mausoleum in which, after cremation, the ashes of all priests who die in the establishment are deposited.

The general style of temple architecture may be gathered from the illustration.

The pinnacles of the roofs are often of a most delicate and elaborate pattern. The tiles of all temples known as "Imperial," *i.e.* supported chiefly by the Government, are of a yellow colour, but in other cases blue or green is the favourite tint. The roofs are tiled as with ourselves in ridges and furrows, the chief difference being that the ridge tile is semicircular in section, thus producing the peculiar effect seen in the illustration.

The engraving on the next page shows the details of the roof of a well-known temple in South China.

The windows of temples, like those of all buildings in China, except where foreign intercourse has introduced the use of glass, are of paper. But we shall notice details of this nature more fully when we deal with the process of building.

The foregoing examples do not exhaust the designs of Chinese temple roofs, although they represent the vast majority. The pavilion in the Temple of Heaven at Pekin is, for instance, of totally different design. It is circular in form, is built in three storeys, and is about 80 feet high. It stands on

an altar consisting of a polygonal structure in three terraces, each about 10 feet high and respectively 120, 90 and 60 feet in diameter, built of white marble, and each protected by balustrades.

It may naturally be asked why palaces and public buildings, which in most countries present the best specimens of architectural beauty, should have been omitted in the sketch already given. But as a matter of fact, both these classes of buildings are, in general design, simply modifications of the

Houses and Shops.

The general design of the native house, however humble, is a modification of the more ornate temple or *yamen* (i.e. official residence and office). There is the same catenary curve in the roof with more or less ornamentation at the gables. A sober drab will replace the gaudy glazed yellow or green roof-tiles, and varnished or plain wood the brilliant paint-work of the more public edifice. But the elevation will still suggest the same general design.



TEMPLE ARCHITECTURE.



DETAILS OF ROOF.

temple and the private house. Although general descriptions of the emperor's palaces have often been published, no trustworthy details as to plan, architecture, or decoration have come to hand. It may also be remarked that although very ordinary inns or caravansaries exist, the temples mostly take the places of hotels in western countries. We now turn to private dwellings.

As already remarked, stone is almost unknown as a house-building material, except for foundations. Bricks, sifted earth, and matting or thatch for the walls, brick tiles for the roof, and wood for interior fittings are the ordinary materials used. Houses are sometimes constructed of wood alone, but are not common. No private house is allowed to equal in height the temples in its vicinity, nor be ornamented in the same manner;

nor may yellow—the Imperial colour—be used about the building. Cellars and basements are absolutely unknown. Two-storeyed houses are infrequent. We summarise from Dr. Wells Williams's well-known work the most important details as to Chinese house-building.

The *Ni Chuan*, or sifted earth, is a compound of sifted gravel and lime mixed with water and sometimes a little oil or varnish, of which durable walls are made by pounding it into a solid mass between planks secured at the sides and elevated as the wall rises, or by beating it into large blocks and laying them like bricks in a wall. When stuccoed and protected from the rain, this material gradually hardens. In houses of the better sort the stonework of the foundation rises 3 feet or 4 feet above the ground, and is laid with great regularity and solidity. Between the stonework and the lower brick-course an "anti-damp" layer of fine-cut straw is introduced, and this appears to be very effective. The fronts of the dwelling-houses present no opening except the door, and when the outer walls of several houses join those of gardens and enclosures the street presents an uninteresting sameness, unrelieved by steps, windows or porticoes. The walls are 25 feet to 30 feet high, usually hollow, or so thin as to be unable to support the roof unaided, nor are the builders very particular about their perfect uprightness. The bricks are the same size as our own and burned to a greyish slate colour, although red bricks are sometimes seen. They are made by hand, and cost from 3 dols. to 8 dols. (10s. to 17. 6s. per thousand). Lime is obtained from shells, and it does not appear that it is ever derived from limestone.

The walls are often stuccoed but not painted, and the bricks are occasionally rubbed smooth with stones and the interstices pointed with fine cement. In place of a broad cornice the top of the wall is frequently relieved by a moulded ornament in burnt clay representing a battle, landscape, cluster of flowers or some other design, defended from the weather by the greatly projecting eave. A black painted band, relieved by corners and designs of flowers and scrolls, is a common and cheap substitute for the carved figures. Chimneys are almost unknown. The smoke from kitchens is allowed to escape through a lattice roof, while open fires are never burned. The charcoal stove is generally used, but in the north the sleeping-rooms are fitted with kang or brick bed-places kept warm by a fire beneath. A hole in the wall acts as a chimney, but numerous deaths from charcoal suffocation take place every year.

In order to support the roof the purlins and ridge-poles consist of strong timber extending from wall to wall and the rafters of slender strips on which the tiles are upheld. In hipped roofs the principal weight rests on pillars, with a series of king and queen posts intervening, by which every part is equally supported; but curb roofs are not made, as attics are as unknown as cellars.

The pillars are of red or varnished wood without base or capitol, of disproportionate shape, and frequently ornamented with carvings or inscriptions, or concealed by scrolls. In the rare cases of the two-storey houses, or where it is impracticable to support the roof in this way, the rooms are contracted and the cross-walls built up to the plate, each room being covered with its own roof. The pillars are occasionally arranged so as to form side passages to the rear rooms, the intercolumniations being screened or built up. A slight ceiling usually conceals the tiling, but the apartments appear lofty owing to the elevation of the roofs.

The general arrangement of a Chinese dwelling of the better class, standing in its own grounds, is that of a series of rooms of different dimensions, separated and lighted by intervening courts, and accessible along a covered corridor communicating with each, or by side passages leading through the courts. In the former case the corridor opens out upon a garden. In towns, where the houses are of one storey and the lots irregular in their shape, there is more diversity in the arrangement and size of the rooms. In the country establishments of the wealthy families it is customary to provide for the increase of members by marriage, &c., by adding additional courts and buildings.

We have already noted that "private" houses are not allowed to overtop any neighbouring temples. An exception to this rule is made in the case of pawnbrokers, who are permitted to build square towers of four or five storeys, the goods received being stored on the upper floors as a better protection against thieves. In nearly all disturbances the pawnbrokers' shops are the first to be attacked and, if possible, looted by the mob. The doorways are defended by stout posts, their lower ends dropping into mortice holes cut in the stone threshold and locked by an ingenious arrangement above.

Glass, as already noted, is unknown for windows in the interior, and in place of it oyster shells are employed (*Placuna placenta*), being scarcely inferior to ground glass in transparency.

The process of building strikes the European spectator as somewhat curious. The first thing is to raise a complete

bamboo scaffolding, which supports a mat roof and thus insure immunity from rain or sun to the workmen. The peculiar value of the bamboo when subjected to a perpendicular strain only is well known. The lengths are tied together with rattan and the scaffolding thus made is as strong and useful as the more elaborate construction of poles and rope used in western countries. The next proceeding is to put in the uprights, and these once in place and sufficiently braced, the roof is at once proceeded with. The walls are therefore built up to the roof. One of the most valuable materials known to the native builder is chunam. It consists simply of lime and earth (or fine sand and gravel) thoroughly incorporated with sufficient water and then beaten to a level with a hand-mall of special shape. This is the universal substitute for plank flooring and its adoption by our own builders would in many cases be beneficial. It is easy to mix and work, and hardens quickly and satisfactorily.

The tools and other adjuncts used by the Chinese bricklayer or mason resemble our own, differing only in shape and size. The hod is replaced by the basket. The average wages of a workman are 20 cents (about 10d.) per day.

It should be noted that underground house drains are unknown in China. All offensive matter is removed every morning by men who are not paid, but pay for, the contribution to the manure heap thus obtained, which they dispose of at fair rates to gardeners and cultivators.

The comparative immunity from epidemic disease enjoyed by the Chinese generally is probably due to this system of removing what would otherwise pass into cesspools and drains. One other point is, in conclusion, worth passing notice. The architect, like the painter or author, however distinguished in his own line, neither claims or receives any special recognition in consequence. Scarcely a single name has been handed down to an admiring posterity, while at the present day the most ingenious builder fails to secure even passing honour. This fact, perhaps, is not the least curious in connection with "The Builder's Art in China."

ST. SAVIOUR'S, SOUTHWARK.

THE fund for the restoration of the collegiate church of St. Saviour's, Southwark, has now reached nearly 33,000*l.*, among the latest contributions being 100 guineas from Lord Burton. In addition to the "In Memoriam" window given a few months since by Mr. H. T. Withers at a cost of 635*l.*, the restoration committee have just accepted another munificent offer by Mr. Frederick Wigan to restore the south transept window, which faces the South-Eastern Railway and is the largest window in the church. It is intended to restore the tracery of the original design, and also to restore the original characteristics of the edifice at this point. The absence of veneration for the antiquities of the church in past times had led, among many other disfigurements and injuries to the fabric, to the cutting away of the stone pillar supporting the centre of an arch in the wall below this window, in order to make a central entrance into the transept here. This doorway is now to be closed, the pillar restored, and the earlier side doorway reopened. The cost of the window and the structural alterations will probably exceed 2,000*l.* Everywhere in the nave and transept the work of restoration is being carried out in a thoroughly conservative spirit. Not a stone has been displaced where it could be helped, the new work being laced into the old with the utmost care, and every vestige of the old church, whether archway, marble column, loose stone, or ornament, is being utilised in the most faithful manner. Thus the old Norman or prior's doorway at the east end of the north aisle, leading to the old cloisters on the north side, has been carefully preserved without any attempt at restoration, together with the monks' entrance to the cloisters through the north wall and an arched recess, probably originally occupied by a recumbent figure. A pit has been formed in front of the monks' entrance inside the building in order to show the entire height of the door, as the sill of the doorway is some 2 feet below the level of the new nave, the present level being the same as that of the thirteenth-century floor. The floor of the old cloisters was evidently lower than the sill of the doorway referred to, and was reached by steps which began on the inside of the building. In the course of removing the back casing to the original Norman work in the west wall of the transept, a holy-water stoup nearly complete was found close by the prior's doorway. The old Norman walling and buttress also revealed the marks on the stone of the fire which burnt the nave in 1207. Inside the north transept on the north wall was found a fourteenth-century aumbry inserted into the Norman wall. Several other pieces of old work at the west end of the nave which were found are also being carefully treated. In the course of recent excavations for a new buttress on the west wall of the north transept a stone coffin with the remains of a skeleton was found 6 feet below the ground. About 5 feet away a portion of a stone lid was discovered with the top downwards. The lid on being examined was found to

be of Purbeck marble and moulded on the edge. It had also a raised Latin cross, link-shape, with the sun, moon and stars in the quarter. An evidence of the desire of the committee to carry out the work of restoration in the most thorough manner is shown in the provision of a recess on the inside of the wall of the north aisle of the nave, above the spot where the poet Gower lies buried, so as to allow of the replacing of the massive monument to his memory which originally stood there, but had been removed to the transept. A number of loose carved wooden bosses, which for years had been lying in the lady-chapel, are to be utilised in the restoration of the ceiling of the tower. Another very interesting discovery has just been made on excavating below the floor of the vestry for the proposed warming arrangements, viz. the remains of the ancient Norman apse. The work of restoration is now in an advanced stage. The stone-groined vaulting of the aisles is all finished, and presents a remarkably beautiful appearance, and will compare with anything to be found in the old work. The vaulting of the nave is now in progress, but it will necessarily be some time before the church will be ready for reopening. In the meantime certain questions as to the future of St. Saviour's are under consideration. There is a feeling in favour of transforming the church into a cathedral for South London, and steps are being taken to this end. Its dimensions are regarded as adequate for such a purpose, St. Saviour's being about the same size as Ely Cathedral.

THE VICTORIA BUILDINGS JOHANNESBURG.

THE following letter from Mr. Lennox Canning has appeared in the *Johannesburg Star* :—

The evidence recently given in the suit of the Johannesburg Board of Executors *v.* The Victoria Buildings Company has aroused considerable public interest about architects, builders and buildings.

My reason for troubling you is not to comment upon that evidence at present, as the action is still undecided, but to call public attention to a parallel case with which my name has been coupled. I also invite the attention of the official whose duty it is to inspect the buildings of the town.

When I was appointed professional adviser to the Johannesburg Office and Safe Deposit Company in London I laid from time to time certain schemes before the board for erecting a block of buildings upon the site of Green's Chambers, among which was a basement to be used for a safe deposit. There was also a proposal to build thereunder a restaurant.

I, however, informed the board that, knowing the nature by long experience of the subsoil of Johannesburg, and having been the architect both of the structure now known as Robinson's Buildings and the Barnato block, it would be very injudicious to excavate adjacent to the foundations of the adjoining buildings. I explained that at the time these structures were built good materials were not to be had, and that the soil was soft and treacherous. I admitted that it was quite possible to excavate not only to any depth, right up to or even under these old foundations if the work was carried out in a scientific manner with proper shoring, needling and underpinning, but—and I lay particular stress upon this point—I urged the board not to undertake such excavation, as it would not only be costly, but would involve some risk, and settlements in the walls of the adjoining building might, in spite of all precautions, occur. The idea of excavating the greater part or the whole of the site to a depth of some 10 feet, as is now being done, was therefore abandoned, and only a small basement provided for a safe deposit. The contract for this work was signed in London at the end of February last. The excavation thus provided was 10 feet away from the walls of the adjoining building at the nearest point, and the greater part of it was 14 feet away. This security-room was projected at a time when it was supposed a similar but more extensive scheme, which I designed in 1889 for the Johannesburg Estate Company, had been abandoned.

I believe the architects at Johannesburg, with one singular exception, are agreed that it is an axiom when a building is razed which adjoins and supports another, that it is not only prudent but necessary to shore up, *i.e.* to place eight strong artificial supports in place of those which have been removed by pulling down the building in question, and I should think the common sense of the public itself, in spite of any muddled balderdash that may be written to the contrary, will need little educating on this point.

These shores or supports may in some cases not be necessary, especially when, for instance, the adjoining structures are not very high, or are built of timber and corrugated iron. But in the case of Robinson's and Barnato's Buildings, both heavy structures, I conceive that as an excavation some 10 feet deep, exposed to the heavy rains of the last few weeks, has been dug adjacent to the exposed, unplastered brickwork forming the bases of the adjoining walls, well-nigh from end to

end of the site, it was, to put it mildly, a serious oversight to omit placing the proper shores which I had provided for in my plans. The consequences of this omission are obvious to anybody. The east wall of Robinson's Buildings has settled, although it rests on a solid foundation of Portland cement concrete, and the whole building is in jeopardy. The western walls also of Barnato Buildings, particularly where the brickwork has been exposed, have also settled since the razing of Green's Chambers and the formation of the excavations.

I am extremely desirous that it should be known that I made special provision in my specification for shoring up between Barnato Buildings and Robinson's Buildings, and if this had been done Mr. J. B. Robinson would have had no need to riddle his building with bolts after painting it so prettily. It is the clear duty, in my opinion, of the official who has charge of the buildings of the town to insist upon horizontal shores being placed between the two buildings.

In conclusion, let me state that the subject of "shoring" forms a special paper in the Institute examination; it is also one of the most stringent provisions of the London Metropolitan Buildings Act. No building standing between two others is ever razed in the metropolitan area without horizontal shores being inserted; and if they are deemed necessary where materials are good, how much more needful are they where materials are bad, and where the climate alone, apart from any other consideration, renders their use imperative?

GENERAL.

The Manchester Society of Architects at a meeting on Tuesday passed the following resolution:—"That the Council, having perused the copies of the correspondence which has taken place between Messrs. Woodhouse & Willoughby and the authorities of the St. Helens Technical School, regret that, contrary to the assessor's award, the committee should have decided to allow the authors of the second premiated design to carry out the work in preference to the authors of the first, a decision which they consider to be opposed to the true spirit of competitions."

Mr. J. W. Trounson, architect, Penzance, has planned extensive alterations and additions for the High Street Bible Chapel, Penzance. The work has been carried out at a cost of 1,000*l.*, and the edifice was reopened on the 19th inst.

Mr. C. E. Oliver, F.S.I., on Wednesday read a paper entitled "Notes on New Zealand Timbers" at the meeting of the Northern Architectural Association, in the Art Gallery, Newcastle-on-Tyne.

The Art Gallery Committee, Leeds, have received nearly 600 pictures for the forthcoming Spring Exhibition. Owing to want of space about 200 only could be selected.

The Manchester Art Gallery was reopened on Monday, after rearranging and rehanging of the permanent collection. Among new pictures are *The Lighthouse*, by Mr. Stanhope Forbes, A.R.A., and Mr. Frederick Smallman's gift, *The Water of the Nile*, by Mr. John Goodall, R.A. Four galleries on the north side of the building have been reserved for the annual Spring Exhibition of the works of members and associates of the Manchester Academy of Fine Arts.

The Council of the Royal Scottish Water-Colour Society have agreed to place lady members on the same footing as gentlemen. Ladies therefore will henceforth be able to attend meetings and be eligible as members of Council.

Mr. William Holyoake, who served as curator in the Academy Schools, died last week, in his sixtieth year, and was buried on Saturday at Highgate Cemetery.

Mr. W. Kenrick, M.P., has given a painting, *Sweet-water Meadows of the West*, by Mr. J. W. North, A.R.A., to the Birmingham Art Gallery, and Mr. J. C. Holder has given a study by Sir F. Leighton, P.R.A., for his large painting, *The Sea Gave up its Dead*.

Mr. Alderman Milling, the chairman of the paving and sewerage committee of the Manchester City Council, stated on Wednesday that the old township of Manchester was 1,646 acres, while the area to day was 12,788 acres. The Corporation had 622 miles of streets to sewer, 7,734,000 square yards of carriage-ways to pave and keep in repair, and 2,812,000 square yards of footpaths to flag and keep in order. At the present time they paid about 1,000*l.* per week in workmen's wages, and the number of men employed in the paving department is 650, and in the sewerage department 300, making a total of 950.

The Partnership of Messrs. Seward & Thomas, architects, Cardiff, expired by effluxion of time on the 31st ult., and it has been mutually arranged by the former partners that they will carry on separate businesses under the respective names of Edwin Seward and George Thomas. Mr. W. P. James, who died in 1885, was the founder of the business.

The Architect.

THE WEEK.

THERE have been so many failures in connection with the Chicago Exhibition, nobody can be surprised at the unprecedented delay in announcing the awards. No list has yet been issued, and it seems quite uncertain when one will appear. Many awards, it is true, have been announced, but none have as yet been officially confirmed. Sir HENRY WOOD has, however, at different times received information, from which it appears that about 1,400 awards have been made in the British section. Of these 836 were in the industrial departments of the Exhibition, and were divided among 449 exhibitors. The total number of industrial exhibitors was 597. Of 501 exhibitors in the Fine Arts Department, 132 received an award; of 1,138 exhibitors in the Women's Work Section, 173 received among them 229 medals; 180 awards went to Indian manufacturers represented at Chicago either independently or in the Indian Pavilion; 54 awards went for British exhibits not under the jurisdiction of the Royal Commission. The lists from which the above statements are collected, it is understood, are liable to modification, so the figures must only be regarded as approximative. In Paris, in 1889, 926 awards were distributed among 1,017 exhibitors.

THE annual meeting of the National Association of Master Builders of Great Britain was held at the North Staffordshire Railway Hotel, Stoke, Staffordshire, on Tuesday. Representatives attended from London, Liverpool, Manchester, Birmingham, Derby, Leeds, Bristol, Bolton, Hull, Northampton, Newcastle, Shrewsbury, Plymouth, Kidderminster, &c. Alderman JOHN BOWEN (Birmingham) was unanimously elected president for the ensuing year; Messrs. THOMAS F. RIDER (London) and J. STEPHENSON (Liverpool), vice-presidents; C. W. F. GREEN (Liverpool), hon. treasurer; W. H. SMITH (Northampton), hon. auditor; and J. A. S. HASSALL (Liverpool), secretary, in place of Mr. W. KNOX, deceased.

AMONG the papers to be read before the Society of Architects during the next few months we may mention the Rev. Canon G. F. BROWNE'S, on "Early Christian Art in England," and those on "Freemasonry in Architecture," by Mr. D. FEARON RANKING, M.A., LL.D., and "Iron-work: Mediæval and Modern," by Mr. GARDNER. These papers will be illustrated by many lantern slides. Mr. ELLIS MARSLAND will contribute a paper on the London County Council's new Streets and Buildings Bill on February 13, and this should bring together a large meeting.

THE annual report of the Archæological Section of the Midland Institute announces that there has been a diminution of nine in the number of members, the total now being 219, as compared with 228 at the corresponding period of last year. The usual number of papers have been read during the year, and have been much appreciated by the members attending the meetings. The attendance, however, still remains comparatively small, and the committee hope that more members will avail themselves of this privilege during the forthcoming year. The papers have been illustrated by drawings, specimens, or lantern slides, and the hearty thanks of the section are due to the readers for the time and trouble they have devoted to their preparation. Among the objects of archæological value which the section has been successful in preserving from destruction is the bridge at Bradnock's Marsh, Hampton-in-Arden. The bridge, which narrowly escaped total destruction last year, was in a decaying condition, but has now, by the generosity of members of the section, been satisfactorily repaired. The committee will be glad if members will inform them if they hear of any important antiquarian relic in danger of damage or destruction. With regard to finance, there is a balance of 67*l.* 1*s.* 10*d.* on the general account, as compared with 55*l.* 4*s.* 2*d.* at the close of last year. The balance in hand on the combined account is 19*l.* less than the balance of last year.

In the annual report of the Nottinghamshire and Midland Merchants and Traders' Association are many references to the business of the past year. Among other matters, it refers to the attempted legislation on building societies. When the Bill was before Parliament last session the directors communicated their views to several of the most active members of Parliament with a view to improving the laws relating to building societies. The view taken was that many of the best of the building societies were doing their work efficiently, were supplying a public want, and that the less interference with their operations the better, except so far as might be necessary to the prevention of wrongdoing on the part of other societies not so well conducted. The societies holding periodical ballots they regarded as involving a dangerous tendency, introducing chances into business transactions, and often leading to questionable results. Particulars were given of certain societies, professedly carried on for the benefit of the working classes, but with operations more than doubtful. On the other hand, the provisions of some of the Bills introduced—for four Bills were so introduced—would, if carried, have been fatal to the best interests of the Societies. The Bills, having been referred to a Select Committee, contained, as reported, valuable provisions tending to prevent fraud and to give solidity without unduly restricting the operations of good and useful Societies. A petition to this effect was presented. The Government, however, withdrew their Bill in September.

DURING several years KELLY & Co., Limited, have made the building trades, the engineers and iron and metal trades their debtors by the excellent directories they have published. It is difficult to estimate the advantages which have been derived from such a manifestation of names. The labour, however, has been enormous and costly. It is only in an establishment where the most perfect organisation prevailed that the inquiries which were needed, the classification and production could be accomplished. The strength of the trades at once becomes apparent from the pages. The firm are always anxious to perfect their work, and from time to time new editions appear which are representative of business up to the time of publication. The name of KELLY & Co., Limited, is a guarantee for accuracy, and the new editions of the two directories relating to the building trades and the engineers and iron and metal trades appear to be completed with the exactitude which has gained reputation for the firm.

THE second of the "Portfolio Monographs" is devoted to Malta, a subject which is well deserving of ample treatment. The author, the Rev. W. K. R. BEDFORD, describes the place as if he were acquainted with every building in it, and excellent illustrations are given of the most picturesque parts. In the churches there is so much sculptured and painted detail it is no wonder they have been rarely illustrated. Photography has been utilised for Mr. BEDFORD'S monograph, and in consequence more justice has been done to the subjects than was the case hitherto. Great care is taken in the narration of the history of the Hospitallers, and the account of the siege by the Turks is of absorbing interest. The new series is the result of a happy thought, and literature and art of a high class have been rarely combined on such economical terms.

THE Council of the Glasgow Institute of Architects are watchful for the interests of architects in the West of Scotland. At the last meeting it was reported that efforts were made to regularise the competitions for the Kirkcaldy Halls and the Govan Congregational Church; the correspondence on these subjects was read and approved by the meeting. The secretary read a letter which he had received from the clerk of the Police Commissioners, stating that the original drawings of the proposed new bridges over the Clyde had been departed from, but that the Institute's suggestions as to the public exhibition of the drawings would be kept in view when new designs had been fixed upon. Attention was called to the new police offices at present being erected on the south side, and the secretary was instructed to call the attention of the Committee on Public Architecture to these buildings.

THE PUBLIC LIFE OF WORKS OF ART IN GREECE.

THE ancient story which has given rise to the saying about the wisdom of a cobbler sticking to his last has been commonly interpreted as if it merely exemplified the worthlessness of a critic's omniscience. The sculptor was justified in accepting information about the inaccuracy of the foot-gear he represented as part of his model, but was to be excused when he rebuked the expert for meddling with other parts of the work. The story is still more valuable as evidence of the privilege which the Greeks—and especially the Athenians—exercised of imagining themselves to be givers of commissions for works of art, and scrutinising statues and pictures as if they were to pay for them. There are many anecdotes preserved which suggest the strength and weakness of the general criticism. One relates to POLYCLETUS. He produced two statues relating to the same subject. In one of them he carried out, as well as he could, all the suggestions for its improvement which were offered by the crowd. The other he preserved unaltered, and when the two were placed side by side, as a matter of course it alone secured admiration. The sculptor pointed the moral by explaining to his fellow-citizens that the successful work was his own, while its despised companion was theirs. It was only a favourite artist who could dare to give a lesson to the Athenians of that sort. Their admiration for his work is revealed by another story from ÆLIAN, which tells us that when POLYCLETUS was named as the most suitable sculptor to execute a proposed statue, the donor would not agree, for, said he, if POLYCLETUS carves the figure, it alone will be applauded, and my generosity will be ignored.

It is not necessary for us to attempt an anecdotic history of Greek art; we merely refer to those cases because they show how prevalent was the belief that works of art were common property, and to justify the selection of the title for this article. Like the statesmen, pictures, statues and buildings possessed a public life.

The origin of a custom which, as we shall see, limited the extent of a man's possession in respect of certain classes of works of art, especially the highest class of sculpture, can easily be imagined. In Greece there was a belief in local deities. Not only towns and districts claimed to be under the special protection of a god or goddess, but certain groves, streams, hills, &c., were also supposed to be no less distinguished. The figure or the symbol of the deity would consequently appear as something sacred in the eyes of votaries. We learn that in an advanced period STILPO, a philosopher, was banished for denying the divinity of a statue of ATHENA, which came from the hands of PHIDIAS. To carry off such a figure was supposed to be an unpardonable sin, not only for the raiders but for their countrymen. Under no circumstances would a statue of a deity be sold. The offer was made to the people of Cnidus that the levy on the town would not be inflicted if the *Venus* of PRAXITELES were surrendered, but they rejected the proposal. The confidence in a Palladium of the kind outlasted the downfall of Greece. It was found in other countries, and the commotion which FLAUBERT, in his "Salammbô," depicts as occurring in Carthage when the zaimph or mantle of the goddess TANIT was stolen is borne out by many circumstances in the history of Greece, Rome and other places. For an individual to possess a statue of the protecting deity of a town or district was therefore to run risks which could not be escaped by presenting the evidence which was acceptable for other descriptions of property.

When polytheism was allowed to have ample expression in art, it was inevitable that for a long period at least the figures of the deities should be esteemed as being of too grand a nature to become a private possession. During the week we have had in our law courts grave discussions among judges and lawyers as to whether the portrait of an individual who had gained notoriety could be introduced in an exhibition without his sanction. To some it was an invasion of the sanctity of private life. The Greeks were even more rigorous in respecting the sacredness that was associated with statues of the deities. The only fitting sites for them were temples or public places.

The relation in which the Greeks supposed themselves to stand before the gods and goddesses was unique. The

people considered there could be nothing on the earth or beyond it which was greater or more beautiful than themselves. When, therefore, they made the deities assume the forms of comely Greeks, they had no doubt that by doing so they were rendering acts of homage. That the old symbol worship was not set aside throughout Greece when noble sculpture was attainable is evident when we learn that TIRUS, on his visit to the Temple of Venus in Paphos, found, instead of a beautiful statue of the goddess, a conical block which was the object of reverence. But, in spite of those exceptions, there can be little doubt that the Greek idea was expressed by HERODOTUS when he wondered how the Persians could have a worship from which anthropomorphism was absent:—"They make no images and do not build altars or temples; they charge those with folly who do such things, for, as I conjecture, they imagine the gods to be altogether different in nature from men, contrary to the belief of the Greeks." Polytheism was less divine than the immaterial power of the Easterns, but it exercised a marvellous influence in advancing the sculptor's art among the Greeks. If the poets considered it was bad taste to allow a god to take part in an unworthy action, the sculptors were no less bound to represent gods and goddesses in the most perfect forms that could be devised, while respecting the traditional characteristics. To the sculptors the deities were not abstractions like Abundance, Temperance, Commerce, Art, Hope, Britannia that once ruled the waves, or other subjects which are used to adorn English buildings, but real beings, whose bodily and mental attributes were familiar to all people. It was no effort for a Greek to imagine that he would be able to recognise one of the dwellers in Olympus unless a disguise was adopted. The sculptor gladly utilised the popular belief, and made it appear more certain. The devotees helped the artist, who in return embodied their thoughts.

It is true; there were types which had to be adopted reverentially; but what a variety of subjects were offered, without going beyond Olympus. To render the traditional characteristics of the divine beings was to express different combinations of majesty and beauty. They could not be supposed to be always dwelling in seclusion; they shared at times an active life, and were not too exalted for the companionship of animals, so that a MYRON need not be prevented from co-operation in the representation of the divinities. Then, as if to diminish the gap between the highest and lowest life for the benefit of art, fauns and satyrs, centaurs, &c., were made part of mythology. There was, consequently, scope for the display of the most varied talents. Let any one recall all that was necessary to represent a *Triumph of Bacchus* adequately; how skill in creating not only youths and maidens, but ancient votaries of the god, wild beings from the forest, frenzied bacchantes, leopards, fruits and flowers was required for the completeness of the composition, and it will be evident that mythological subjects demanded the highest gifts of the artist. If we remember, too, that a painter or sculptor was subjected to a sort of microscopic criticism of details by men who were as exacting as the nameless but immortal cobbler, the success of the ancient artists will appear less remarkable. They were kept up to a high standard because their works were not intended to be placed in secluded cabinets for the delight of a few admirers, but had to be judged worthy to be seen in public places by gods and men.

How Bacchic processions and similar rites could be accepted as religious ceremonies we need not inquire. The "language of the chariots" employed in those outings could not be considered as prayers or pious exclamations, if tested by a Christian standard. Some say the deities were only figurative of the phenomena of nature; perhaps it would be nearer the truth to say they were accepted as grand seigneurs, whose association with a place brought it honour—who were able to be protectors, and if becomingly treated would be glad to show their power. The universe in those days was considered as being limited in extent, and if the gods did not busy themselves in human affairs how was their activity to be exercised? Accordingly, when NEPTUNE and MINERVA fell out, the quarrel was determined by the protection of whatever was most advantageous for the Athenian people, and the goddess won by creating the olive. It is no wonder men thought of

MINERVA as surpassing the citizens in love of Athens, and in various degrees the rest of the Immortals were supposed to be associated with the city. About the value of a Greek who had tried to serve his State there might be differences of opinion, but all were sure to agree about the worth of the feeling for Greece—the sublimated affection or patriotism which animated the Olympians. Greece could hardly be said to possess a priestly caste; yet from the interest which was supposed to be taken in the people by the gods the temples became as it were the centres of national life. The public games and competitions were connected with them as well as the festivals and assemblies which were supposed to be religious. Once they came under divine patronage all classes of people became equal, and the crown of wild olive, which conferred so much dignity on the possessor, could be carried off by a water-carrier or a tanner from the son of a general or statesman. Polytheism was therefore an efficient aid to union, especially among a people in whom selfishness was of remarkable power, and the rulers were not slow to perceive that every temple, statue and painting devoted to any of the favourite gods became persuasive of public interests.

It was agreeable to be assured that a divine being was enamoured of a particular town; but occasions arose, as when alliances were necessary, in which it became requisite to assume a broader and more generous manner of looking down on Greece. The Amphictyonic Councils were in consequence placed under the protection of deities, who were not commonly supposed to be diffusive in affection. NEPTUNE protected them in Bœotia, JUNO in Argolis, APOLLO in Delos, and so on. In return the oath was taken, whenever there was a meeting, that if any insult were offered to a god by an attack on his temple, all the cities and districts combined in the league were to unite in order to avenge the crime. In that way, by promoting union, the gods became representative of federalism, as at other times they could be taken as upholding a spirit that was almost parochial in its limitation. The inconsistency only made them more dear to the Greeks, for it suggested a common nature.

As a consequence of the elasticity of the theology, it became impossible to discriminate between religion and good citizenship. The raising of temples or statues was a patriotic act. Men were willing to suffer sacrifices in order to expend wealth on art, and hence were often saved from concentrating their thoughts on their own petty interests. The old Greeks present as puzzling contrasts, as we can still see in a journey through their country, and thus we find it recorded that men who seemed ready to betray their cities to gratify revenge, on other occasions were ready to act as if they were only a part of an organised body.

The appearance of Athens was by itself a testimony to the extent to which general interests could be pushed. From an early period it had its faithful inhabitants over whom it exercised a fascination. Did not PLATO, when his doctors ordered him to leave the city if he valued his life, declare that not even Mount Athos and the hope of a longer life could tempt him to remove from his Lyceum? Yet, apparently Athens was not a desirable place to reside in. When a description of the tumble-down condition of Gallipoli appeared some years ago, Dr. NEWMAN (afterwards Cardinal) came to the conclusion that it must have resembled Athens in its palmy days. He said:—"Learned writers assure us distinctly that the houses of Athens were for the most part small and mean; that the streets were crooked and narrow; that the upper storeys projected over the roadway; and that staircases, balustrades and doors that opened outwards obstructed it. I do not doubt at all, though history is silent, that the roadway was jolting to carriages, and all but impassable, and that it was traversed by drains as freely as any Turkish town now. Athens seems in these respects to have been below the average cities of its time. A stranger, says an ancient, might doubt, on the sudden view, if really he saw Athens." There does not appear to be any distortion in the description. Who does not remember the saying of EUCRATES about the rickety condition of the house in which he was dining, "We ought to assume the attitudes of caryatides here, our left hands being held up to support the walls"? Or who does not recall what XENOPHON says about the removal from Athens to a country place being longed for by

children, and found delightful by their mother? While the houses were uncomfortable and insalubrious, the public places of Athens were beautiful. CIMON laid out a fortune in building noble porticoes, in forming groves, gardens and fountains for enjoyment. PERICLES expended the money he could acquire in the adornment of the city. Some years afterwards DEMOSTHENES could refer to the difference between the public buildings and the ordinary habitations as evidence of the public spirit of the old Athenians. While the public edifices could not be excelled, the house of ARISTIDES or MILTIADES was not to be distinguished from those of ordinary citizens. According to the orator, some of his contemporaries had made their own houses much more magnificent than the public edifices, and a more sure sign of degradation was not to be found. We see the same theory of duty manifesting itself in PLUTARCH when he wrote in scorn about the splendour of the villas of the Roman LUCULLUS:—"Among frivolous amusements I cannot but reckon his sumptuous villas, walks and baths, and still more so the paintings, statues and other works of art which he collected at an immense expense, idly squandering away upon them the vast fortune which he had amassed in the wars." The biographer might be able to realise the luxury which was gratified by having paintings, cups and jewellery in a man's chamber, but noble buildings and statuary appeared to him to be deprived of their best qualities when they were not exposed for the delight of rich and poor. PLUTARCH had recorded and heard of too many cases in which works in marble and bronze were created out of the public levies, or by means of the money of men who were anxious to display their citizenship, for him to believe that they could subserve what was known at a later time as connoisseurship.

In our time the individual is supreme, and art corresponds with the idiosyncrasy of the artist or the patron. To please the crowd it is supposed to be necessary to produce theatrical or unrefined effects. The Greeks associated not only power but every good gift with the multitude. The Cyclops were inferior in HOMER's eyes because they were not accustomed to meet in assemblies. The mere possession of speech, according to ARISTOTLE, was a sign that men were to live not only in families but in political parties. To be deprived of a citadel, agora, gymnasium, theatre, fountain and other places where men could congregate would be, according to others, to want the things which made life endurable. The buildings and the statues were, therefore, accepted as being dedicated to the highest uses, and it is no wonder they were subjected to severe criticism whenever it was supposed the artists were not faithful to the inspirations which the gods bestowed for the benefit of the citizens who were under their protection.

ADAM ARCHITECTURE IN LONDON.*

By PERCY FITZGERALD, M.A., F.S.A.

THERE are a few notable architects who have left their mark, as it were, upon this great city of ours, and whose work is to be recognised almost at a glance; such as Wren and his pupils, Sir W. Chambers, Sir John Soane, and Nash, the designer of the Regent's Park plaster terraces and Regent Street, to say nothing of the modern Queen Anne fashions. But the architect most remarkable for a distinctly original style was assuredly Robert Adam and his brethren. And it is interesting that over a hundred years after his death we should be gathered here to-night to consider his works in this spacious building, designed by him in this large quarter of the Adelphi, also erected by him. Even the very ground upon which I stand was raised by him high in the air to the level of the Strand, from the low-lying shore of the Thames.

The Adams were a remarkable family. The father was a fashionable architect, and built a vast number of noblemen's mansions all over Scotland, which show good sense and excellent effect. His four sons—after whom the streets about us here are named, Robert, John, James and William—were architects also, though one only, Robert, was the genius. It is remarkable that a single family should have thus engrossed the work of almost an entire century—the father during the first half, the sons during the last.

Robert Adam was a clever, well-cultivated, aspiring young

* A paper read before the Applied Art Section of the Society of Arts on Tuesday, January 30, and published in the *Society of Arts Journal*.

man, who received a University education. He had good connections and high patronage, and could have at once stepped into business, but he determined first to thoroughly cultivate his talent and form his style. In 1757, nearly 140 years ago, he set off on the grand tour, visiting Rome and other Italian cities. But the old remains—amphitheatres, temples, baths, forums, and the rest—did not supply him with what he wanted. What he sought was some monument of a residential kind, which would furnish him with ideas as to how the ancients treated their domestic architecture, and whose system he might adapt to the mansions of the opulent lords at home. At Rome he had been struck by the arrangement and ornamentation of the Baths of Titus and Diocletian, and this suggested to him a direction for his studies. He had learned that in Dalmatia, on the coast opposite Venice, there was a very remarkable and striking building of this kind—the Palace of Diocletian, in the Bay of Spalato. This he determined to visit and study thoroughly. Accordingly he took with him some artists, with an ingenious French architect called Clerisseau, and set sail for Dalmatia.

There is really much romance and even poetry associated with this place and the story of it. The Emperor Diocletian, when he abdicated, built himself a vast palace here, the sight of which almost confounds the traveller. It was an enormous pile some 600 feet square, containing temples, and halls, and gates, and arcades. So well preserved is the city through all its vicissitudes, that the great Temple of Jupiter is, to this hour, used with little alteration as the cathedral; while the Temple of Æsculapius serves as a baptistery. It has fortunately been preserved in excellent condition, owing to the fact that the inhabitants have built their houses in the palace itself, and utilised the walls for their own dwellings. This fascinating monument has been visited by many travellers, both French and English, such as the late Lady Strangford, Sir Gordon Williams, and Mr. Jackson, the architect, who all seem to have felt the charm of the place; and we can conceive the feelings of the aspiring young architect as he sailed into that Dalmatian bay. But the most striking feature of the whole, and which most impressed the imagination of the young architect, was the great terrace on the sea—a most picturesque and astonishing thing, which must have inspired any architect of true feeling. It suggested to him another monumental work which he carried out on his return. He remained here nearly two months, studying and making the most careful drawings, until he had thoroughly permeated himself with the entire spirit of the place. The result we have in a magnificent atlas folio, which was issued under the highest patronage, not of England only, but of all Europe.

So little is known nowadays of Adam's work, that I fancy the average superficially informed man in the street if asked about it would reply, "Yes; I know Portland Place, and all that; and there is the Adelphi." Yet it will indeed hardly be credited what an amount of Adam's work is to be found, not in London alone, but all over the three kingdoms. I have taken great pains and made careful search, and have been able to compile the following catalogue of his works, the first, I fancy, that has been made:—

The Adelphi; Portland Place, with Mansfield Street; a portion of Harley Street; Stratford Place, in Oxford Street; Finsbury Square; portions of Dover Street and Grafton Street; Spring Gardens; one side of Portman Square; Portman Street; Hamilton Place; George Street, Westminster; Bedford Square; Gower Street; Cumberland Place; Seymour Street; Bryanston Square; mansions in Whitehall; Gwdyr House and, possibly, Whitehall Place; houses in Berkeley Square and Hart Street; the long terraces at Kensington known as Upper and Lower Phillimore Place; Fitzroy Square; York Place; houses in Weymouth Street; in Devonshire Street; in Manchester Square; the Duke of Cambridge's house, Park Lane; houses in Soho Square; in Bruton Street and in Russell Square; terraces in the Walworth and Old Kent Roads; and at Kennington. Besides a number of buildings which have escaped search, or which have been swept away.

Thus much for streets. His mansions in and about London, and in the provinces, are many. There are:—Montagu House, in Portman Square; Harewood House, in Hanover Square; the Admiralty Screen, Whitehall; a wing of Northumberland House (now pulled down); Lansdowne House, Berkeley Square; the great building of the Sunday School Society in Serjeants' Inn; mansions in St. James's Square; Chandos House; Foley House; Boodle's Club, St. James's Street; "British" Coffee House, now destroyed; Coutts's Bank in the Strand, and a large clubhouse in Piccadilly.

Outside London there are Kenwood, Lord Mansfield's mansion at Hampstead; Osterley House, Lord Jersey's fine mansion at Brentford; Sion House at Isleworth, restored and decorated by him; a fine house in Conduit Street, opposite Lewis & Allenby's; additions to the United Service Institution; Lord Fife's house at Whitehall, decorated by him; a Gothic ceiling, designed for Horace Walpole, no doubt for

Strawberry Hill. During his life there was a proposal to re-erect the Houses of Parliament, and he furnished some elaborate designs in the conventional Greek style; a central portico with wings.

About the middle of last century most of the noblemen and gentry were busy building mansions and castles, and Adam was almost invariably called in. In Scotland he was largely employed, and Edinburgh can boast numbers of public buildings, squares and terraces from his hand. There are also fine mansions in Dublin and Bath of his work. Nearly all the great towns, such as Glasgow and Newcastle, can boast some fine specimens of his work. At the time of his death he had actually in hand no less than eight public buildings and twenty-five great mansions, an amount of commissions enough to make the mouth of even a reasonable architect of our times water. It is altogether an astounding record of work.

At this point we may pause to ask what are the principles of this Adam's style, which strikes us as something apart from all others. Most of us will recognise an Adam front, or an Adam doorway and window, or Adam furniture, chimneypiece, grate, &c., the principles are carried out so logically. There are many I know who object to the style; it has been called tame, prim, mincing and insipid, but this arises from its thorough correctness and propriety. Elmes, father of the architect of St. George's Hall, speaks of "the finnickin' finish" of his work, and "the depraved school of the lower and middle empire" which he introduced. The late Mr. Fergusson says "his style was of the thinnest and most tawdry class." But he concedes its originality and correctness, which are great merits, and to some of his works gives unstinted praise. Perfect correctness and reserve will always appear prim and "finnickin'" to those who are accustomed to extravagance.

The first merit of Adam's style we trace to an exquisite sense of proportion. In our day this principle is rather set aside. We cannot blame our architects for this, for we live in a highly utilitarian age, and what is required is the utmost accommodation the ground will admit of. Little attention is given now to the beautiful proportions of the column, which, in Adam's hands, had a special grace. It is not known that the chief columns in London, that in Trafalgar Square and the Duke of York's, are both shorter by some 20 or 30 feet than they ought to be, owing to the funds having failed. The Victoria Tower is also shorter by a whole storey than it should be, with the result that it seems squat and stunted. Even in the common doorways and porticoes we see this inattention to the graces of proportion. An ordinary Grosvenor Square or Brook Street portico is a gross, sprawling thing, made by rule of thumb, out of all proportion to the door and to the house itself. A modern London portico is usually made to discharge the double duty of a portico and balcony—always a mean and ineffectual shift. A balcony is a fine thing, as we can see from the Venetian patterns, and a portico is a fine and attractive thing. But this hybrid balcony-portico destroys the function of each, for the balcony ceases to be a balcony, and becomes really only the top of the portico, while the latter has to be raised high, so as to reach the level of the window, and fails to give shelter. Such is Nemesis. In Adam's doorways there is a placid grace and reserve, a perfect refinement of treatment, not obtrusive, and yet asserting itself, with the delicate ornamentation of the garlands. The whole is most pleasing. The portico of Chandos House has the same airiness and grace.

I have often speculated why it is that a column out of proportion should seem shorter or taller than it really is. I fancy the reason is that the eye that is trained to correct the proportion expects the column to be higher or thicker, and supplies the portion that is wanting. Or it may be that when the proportion of the column is correct the eye travels upward swiftly; but when it is thicker than it should be the eye is delayed and drawn aside, and the feeling of height lessened. If we were to widen and widen the column till it became a square all sense of height and breadth would disappear, as the object would be as broad as it is long. Garrick was often ridiculed on the score of his being such a little man, notably by Quin, the actor, who was a broad, unwieldy man. Hogarth undertook to prove by a drawing that Garrick was really tall, owing to his good proportions, and of the same height as Quin himself.

Another direction in which Adam's delicacy was shown was in mouldings and cornices, friezes, medallions, ovals, &c. In nothing is expression and feeling so much shown as in the contour of a moulding; it is akin to style in literature, or to the graces we see in "the human face divine." It would be thought, for instance, that no grace or beauty could be added to a dead wall of brick surrounding a garden, such as we see at Berkeley Square, before Lansdowne House. A rude coping of stone might be added to preserve it from the wet. Yet every time we pass it we recognise Adam's graceful touch, who has refined this homely wall. There is the feeling of proportion in the suitable height of the wall, the delicately-moulded coping and the base. The keynote to the whole is in the oval

ornament on the pier, of which he thought so highly that he had it beautifully engraved, as a thing of beauty.

Another principle was proportion in the materials. The material that he had to use for his building was what is called the common "stock bricks," ill-fashioned and ill-blended, for patent bricks did not then exist. Between this poor, homely material and the heavy stone "dressings," pillars, pediments, there was an incompatibility. The garnishing thus becomes too heavy, and the framing more substantial than the picture itself. Feeling this incongruity, he used the greatest restraint in his additions. Before his day the fashion was for huge, massive porticoes, pediments and columns, which impeded the light and overpowered the main building. Adam always made his pediment a portion of the façade, outlining it, as it were, on a surface; his columns were always "engaged"—that is, sunk in the wall, so that only half is shown. This gives a sort of homogeneous air, and makes the whole one mass. But a more important element was his use of a wonderful material—a cement—invented by one Liardot, a Swiss clergyman, which had the enduring character of stone and all the flexibility of stucco. It is impossible to say too much in praise of this material. It had none of the meanness or degrading air of stucco, but improved with years, and there are specimens now to be seen, over 130 years after, which, for sharpness and cleanliness, cannot be distinguished from stone. Out of this material he fashioned those pilasters which are an unvarying note of the Adam style. These he embroidered over with a decoration, his favourite pattern being the graceful honeysuckle sprays, a form which he brought from Dalmatia.

He must have used thousands of tons of this material in his ceilings and other forms of ornament, and they are as perfect to this day as when they were set up.

Horace Walpole always spoke sarcastically of Adam's work, though he occasionally employed him. He likened these decorated pilasters to a soldier's old coat, with its lacings down the seams; and, praising another work, he said, "It is grand, not tawdry, nor larded, nor embroidered with shred and remnants and clinkant, like the harlequinades of Adam, which never let the eye rest a moment."

Adam may, indeed, be said to have "glorified the arch" wherever he could; where others had squares or oblongs he had curves. He would bend the fronts of houses into bows; he would curve the dividing wall between a front and back room; he would arch his ceilings. The backs of his houses are agreeably diversified by assuming such forms. Thus the rear of the houses in Stratford Place is so agreeably broken as to offer something almost picturesque; and who shall say that this is not a most agreeable entertainment for the eye? The arch suggests ease and security, and also a sort of movement, as from the centre to the circumference. Things square or oblong suggest weakness and angularity.

But the most striking and original feature in his buildings was his system of fenestration, as it was called—his arrangement of the windows—by means of which he imparted a variety and beauty to his façades. In common brick dwelling-houses we find the windows treated in a negative fashion; they are simply holes in the wall, placed in rows. Adam's aim was to remove this air of monotony. He made them express what was within, and furnish as much light as possible. To this end he would group three windows together in the centre, arching the middle one, and separating them by columns. The building in which we are assembled is really a fine one, as well as a typical specimen of his system, and shows all its features.

The grouped windows in the middle signify to those outside that there is a great room behind, while the archway over it supplies the idea of strength and security which so large an opening might imperil. We should notice here the graceful, compact, business-like doorway and the dignity of the pediment and pillars, which harmonise with and do not overpower the brick. This triple window he brought with him from Spalato and used in almost every building that he erected. It might almost be considered his trade mark. It will be recognised in the Sala Regia, only he transported it from the ground to the second storey, and of a door made a window. There was a deeper meaning in his lunette, or arched window, a feature of which he was very fond, and there is scarcely a building of his without it. The lunette was a segment of a circle, not a half-circle, but about a third—a delicate distinction which an architect will appreciate—and I have no doubt it could be expressed by a mathematical formula. This device he used not only in windows, but for the fanlights of his doorways, adopting this smaller segment which, as it were, elongated the area and was more graceful.

Adam often gave a sort of finish to his houses by placing a lunette window in the upper and even lowest storey, by way of finish or apex. This, too, he also introduced from Spalato. With such devices, lunettes, grouped windows, columns, small niches and always elegant doorways, he contrived to impart an air of animation and expression to the otherwise monotonous face of a brick house.

In Trafalgar Square, where Mr. Stanford's map-shop is

now, there was a building known as "The British Coffee House," which used to be admired—a very pleasing composition, and which the architect himself was pleased with, as an elaborate engraving of it is given in his great book. This sort of design is clearly a reminiscence of Spalato, though it might not appear so at first sight; but in the ruined Golden Gate of the Palace the architect will recognise the design, for here are the lunettes and niches, and the general disposition of the whole façade.

But his last and best work, Gosford House, in Scotland, shows what picturesque animation he could produce by the arrangement of the windows. This design is full of expression and even vivacity. Each portion of the house attracts by some variety and claims attention for its expression and movement. The three great windows in the centre suggest lightness and airiness, the ornamentation is graceful and charming; even the little semicircular window next the ground has a piquancy, and, small as it is, asserts itself and catches the eye, like the little terrier in Landseer's picture of *Dignity and Impudence*.

Another note of the Adam style is the sincerity and truthfulness of the designs. Ornament or decoration is not introduced for the sake of ornament, but simply as a part of the expression. Another, the admirable workmanship, the perfect construction always found in the best specimens of old native or foreign work. The current work of our time is not remarkable for this merit, as it is associated with the general demand for cheapness. These, of course, are the marks and tokens of all good architecture, just as Mr. Guinness, the eminent porter brewer, when asked what was his secret, replied that his secret was the using only good materials. In short, we may always know an Adam house by these signs and tokens—by the triple window in the centre; by the elaborate fanlight over the door, and its elongated, lunette shape; by the breadth of the windows, the double doors, the ironwork, railings, knocker even, and the rest.

(To be continued)

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

There being no preliminary business beyond confirming the minutes of the previous meeting, Professor Robert Kerr was at once invited to read his paper, entitled

Observations on the Plan of Dwelling Houses in Towns.

Professor KERR alluded first to the art of plan, incidentally saying that construction was comparatively easy. The better the designer the more difficult was his work as regarded design, while ease in planning often meant careless planning. Home comfort was the special characteristic of English houses. Climate exercised great influence on houses. What was seen in Italy would not be found in Scandinavia. Here we had the town house and the country house. In the town house height had to be substituted for breadth in the building. Crowding was a characteristic of towns, and the larger the town the greater the crowding. Unhealthy conditions resulted from crowding.

The disappearance of the towns of antiquity was no doubt due to the intolerably polluted condition of the soil. Nature, however, came to aid the town dwellers by lowering the vital standard and enabling them to live. As regarded plans of towns, each town had initiated its plan chiefly by chance, being influenced by lines of roads, business requirements, &c. Laying out towns, as it was finely termed, was only remedying glaring defects. Mr. Kerr referred to the history of Regent Street and its improvement in connection with the Prince Regent. The houses had become shabby little shops, below the mark of many a new third-rate street, marvellously made the best of, but cumbering the ground, scarcely worth their ground-rents but for the exigencies of the locality. He thought there was not such another instance in the world of so ambitious and successful an enterprise of building improvement being so prodigiously distanced by the advance of society within the limits of a single lifetime. In about twenty-five years the Regent Street leases would fall in *en masse*, and the difficulty would be to rebuild without disorganising a considerable proportion of the trade of London. What ought to be done was becoming a very grave public question. He suggested the possibility of beginning to build forthwith, and then we should have a brand new Regent Street to show long before the twenty-five years were out, not only as a great benefit to the public and the town, but equally to the advantage of the Crown estate. The first step should be the construction of a spacious subway along the centre line, which might accommodate the traffic of rebuilding. Classifying houses in a general way the town house, the suburban house, the semi-detached house, the working-man's house and, lastly, flats were referred to. Suburban houses, having escaped from town, should have as much space as circumstances would allow. Points to be considered were convenience, privacy, comfort, aspect and prospect, relations as to sunshine, light and air, &c. In

suburban houses there was no excuse for darkness or bad smells. They should not be fusty, and the hall and staircases should be as large and as bright as possible. In semi-detached houses noises should not from economy of brick-work be heard through the party wall. As to houses for the working classes, the condition of the homes of the great masses of artisans and their inferiors in large towns was not only unsatisfactory in theory, but in practice deplorably and actually below that level of domestic discomfort where degradation began to result. What working people wanted was not the dole of charity, it was proper value for reasonable rent. The term "flat" was, he believed, derived from the Scottish word that meant a floor. Medical men were, however, beginning to complain of the insalubrity of flats. In regard of foreign houses, in America the prospects were promising. After alluding to the jerry-builder, Mr. Kerr concluded by remarking that he had taken his audience over a large area, and consequently could only treat his subject somewhat superficially.

Mr. WHITE, the secretary, read a letter from Mr. Arthur Cates, who said that the suggestions made by Professor Kerr, that all tenants willing to surrender the remainder of their leases and rebuild on a general improved plan, had been put into practice on the Crown estates for the past twenty-five years. One of the most recent instances of this mode of action was the new Queen's Hall in Langham Place. There were great difficulties in the way of dealing with portions of properties before the expiry of all the leases, one being the number of subsidiary interests arising from sub-leases and settlements that had to be considered; another that areas for rebuilding could best be dealt with as independent blocks. Every scheme was carefully considered by the Crown authorities. It was a question whether the difficulties in the way of rebuilding on comprehensive scales would not be increased in the metropolis by the provisions of the London County Council's Bill now before Parliament.

Mr. LACEY W. RIDGE, in proposing a vote of thanks, referred to risks that existed in regard to some of the provisions of the Building Act Amendment Bill now being promoted by the County Council.

The vote of thanks was seconded by Mr. John Slater, who gave his experiences as surveyor to the Berners Estate, north of Oxford Street, in dealing with the numerous interests involved when rebuilding old properties on valuable sites; and the motion having been spoken to by Messrs. W. Kidner, J. J. Stevenson, Aston Webb, and the President, was carried by acclamation, and briefly acknowledged by Professor Kerr.

A collection of designs for town houses was exhibited, lent by the President, and Messrs. Norman Shaw, R.A., Waterhouse, R.A., Professor Aitchison, J. M. Brydon, T. E. Colcutt, Ernest George, Edwin T. Hall, William Young, Wimperis & Arber, William Burn, J. J. Stevenson, &c.

The reading of the paper occupied somewhat over an hour and a half, and the proceedings terminated at 10.15.

RENAISSANCE ARCHITECTURE.

IN the fifth of the lectures under the auspices of the Glasgow School of Art, by Mr. William J. Anderson, the special division treated of was "The Culmination of the Renaissance in Rome." This was distinguished from earlier periods partly by the suppression of elements of design foreign to classical taste, as well as by a greater facility in composition, richness of modelling and artistic reserve. It certainly partook more of a classical revival or reproduction than in its earlier stages, but was justified by its success if by nothing else. For there can be little question that much of what was produced in the first half of the sixteenth century in architecture as well as in painting was superior in many ways to anything that had been done before. Never were all the arts more united in a common purpose, nor had they ever abler exponents. In the period embraced between the years 1506-50 all art subsequent to that of Greece culminated. In so far as it was a resurrection of antique art it was appropriately and naturally consummated in the heart of the ancient world, for Rome at this time had recovered some shadow of its former prosperity, and had become once more in a limited sense the capital of Italy. If it did not wield its empire over Italy as in former days, it became the centre of an influence which had moulded the art and architecture of the civilised world more than any other. Brief sketches of the lives and works of the leading architects of the time were given by the lecturer, including Sangallo, Raphael, Peruzzi and Michel Angelo, and an analysis of the Roman Palazzi followed, with numerous illustrations. The history of St. Peter's Cathedral, part of which belongs to this period, was considered in detail, plans and projects of various architects being shown on the screen, together with elevations and views of the existing fabric.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual report of the council of the Yorkshire Archæological Society (which used to be known as the Yorkshire Archæological and Topographical Association) refers to the incorporation of the Society. It states that with this change in the constitution of the Society it was thought desirable to abbreviate the name by which it had been known for twenty-years by altering it to that which it now bears, and it was hoped that a long era of progress and prosperity was in store for the Society, and that all who were interested in Yorkshire antiquities would rally to its support and enrol themselves as members. The Society had had three excursions during the year, the first being held at Rievaulx Abbey and Helmsley Castle on July 26. On September 28 about a hundred members of the Society visited Kirkstall Abbey to see the works of exploration and preservation that have been carried on there for some time by two of its most distinguished members, Mr. Micklethwaite and Mr. W. H. St. John Hope, and they had the advantage of the presence of these antiquaries to explain the steps taken and the "finds." In spite of wet weather a very enjoyable and profitable afternoon was spent, and it was the decided opinion of the members present that the ruin was being carefully and well treated. To Mr. Micklethwaite and Mr. St. John Hope the Society was again indebted for their help in these excursions. On Thursday, August 10, Mr. Browne, the secretary of the North Riding section of the Society, organised a very successful meeting to Bedale, Snape, Well and Tanfield, which was well attended.

The report of the Record Series states that during the year three volumes had been issued to subscribers, namely, the second volume of the Selby Coucher Book, a volume of the York Wills Index (1554-68), and a volume of Abstracts of Royalist Composition Papers. The thanks of the council and subscribers were again due to Dr. Collins for editing the volume of Wills Index and seeing it through the press, and Mr. J. W. Clay was also to be thanked for the volume of Royalist Composition Papers, which had been transcribed at his expense, and which he had edited for the Society. Mr. W. Paley Baildon's volume of Monastic Notes was now in the printer's hands, and would form the first volume for 1894; the second volume would be either the Subsidy Rolls for the North and East Ridings, which, as mentioned in former reports, were to be edited by Mr. William Brown, or else a further instalment of the York Wills Index. The special fund which had been raised for the preparation of this index would be exhausted in the course of the current year, and it would not suffice to carry the index up to the year 1636, which was the date of commencement of Dr. Collin's Index of Untranscribed Wills in the York Registry. It seemed desirable to carry the index up to this date, but at present it was scarcely possible to form an estimate of the cost. Mr. J. A. C. Vincent had prepared abstracts of a sufficient number of Yorkshire inquisitions to form another volume similar to Volume 12, and they would be edited by Mr. William Brown, and issued as one of the volumes for 1895. Mr. Paley Baildon had kindly offered to prepare and edit a volume of Early Chancery Proceedings relating to Yorkshire. The council had gladly accepted this offer, and proposed to issue the volume in 1896.

Colonel Wilson, the chairman, in moving the adoption of the reports at the annual meeting, said he should like the Society to secure a home somewhere, where they could store objects of interest. He was sure that in time they would get together a very respectable collection, and he felt that until they had some home their operations would be more or less desultory. They had something like 600 members, but he thought they ought to have more in a large county like York. They had a sum of about 1,200*l.* invested, and the result was an income of 40*l.* 11*s.* 8*d.* yearly; but if they got a substantial increase in the number of members they could make a very satisfactory use of their subscriptions. One of the most important works undertaken by the Record Series was the indexing of the wills at York. Fortunately, owing to the exertions of Dr. Collins, that work had not only been undertaken, but so much progress had been made as to show that within a reasonable time it could be completed, but that depended upon the support that was received. Some years ago a special subscription list was opened to enable them to procure the services of a transcriber to continue the work which Dr. Collins commenced. They received 348*l.* 9*s.*, which had been expended, and if they could obtain further subscriptions they would be able to complete the work very much sooner than they otherwise could do.

Mr. G. W. Tomlinson, one of the secretaries, stated that the Council had made arrangements for a new translation of Domesday Book, so far as it affected Yorkshire, and they had issued a list of unidentified place names in the hope that local knowledge might be brought to bear upon them. They wanted to have as much help from the outside as they could.

Mr. Walker said that he was anxious during the next year to see a photograph branch of the Society established, as had been done in Warwickshire. He brought the matter before

the September meeting of the council of the Society, and after some thought and several consultations with his colleagues and members of photographic societies, he issued a circular on December 5 to sixteen societies in the county, stating the object aimed at, and asking for the co-operation of those societies with a view to securing photographs of the antiquarian and other objects of interest for the preservation and illustration of the architecture, antiquities and art of the county of York. To this circular he had received six replies. The Huddersfield Naturalist and Photographic Society and the Beverley Sketching Society were willing cordially to render any assistance. The Rotherham Society had to some extent anticipated him, for they were making a survey of their own district. The Sheffield Optical Lantern Society would send them word if they obtained any negatives during their summer excursions that were likely to be of use as an addition to their collection. The Selby and the Sheffield Photographic Societies were considering the matter, and from the remaining ten societies he had had no reply to his circular, but hoped that when their committees met they would take the suggestion into consideration. On December 19 he had a letter from Sir Benjamin Stone, who had been the leader in the very successful Warwick experiment, and he would be glad to give them the benefit of his advice and experience in starting their survey. The council would be glad of any suggestions from members or others interested in the scheme.

NEW ZEALAND TIMBERS.

AT the meeting of the Northern Architectural Association, Newcastle-on-Tyne, in the absence of the president (Mr. J. H. Morton), Mr. J. Oswald occupied the chair.

Mr. C. E. Oliver, F.S.I., read a paper on "New Zealand Timbers," of which the following is an abstract:—

Notwithstanding that, to the architect, the study of timber and timber trees is of the greatest importance and vastly interesting, it is, I believe, the most neglected subject in that long and ever-increasing list of things he is expected to have a knowledge of. A knowledge of timber and the timber trade is absolutely essential to the architect who would write a practical, straightforward specification. Timber is unlike any other of the materials of construction with which we have to deal, in so far as (1) it is not only the most perishable, but the most liable to serious defects of all the materials we use; (2) we have no substitute for it in most of its uses; (3) we are absolutely dependent upon importation for our supply. In the study of timber, archaeology, architecture, geography and botany are all curiously interwoven; nor let this last-named subject alarm you, as but little botanical knowledge will suffice for your purpose, but geography is very important. If you commence by forming a small "wood museum" for yourselves, and diligently reading up such works as William Stevenson's "Trees of Commerce" and Laslett's "Timber and Timber Trees," you will soon acquire a fund of practical information which will be a pleasure to yourselves and a benefit to your employer. I would also commend to your notice for careful perusal such papers as that read by Mr. Barnes in December last at the London Architectural Association, and also remind you that much information will be found in the *Timber Trades Journal*. There are an immense number of works bearing more or less upon the subject. Professor Sargeant's great work, "Timber Trees of North America," is most comprehensive, and contains without doubt the best account of American timber trees ever published. The architect of the present day must needs add largely to the old list of woods of which he should have an intimate knowledge. The fact that the best class of Baltic goods are becoming increasingly difficult to obtain, and the Canadian pine rising to such a high price, together with the extremely low steamer freights now obtainable, is bringing many other kinds of wood within our reach which but a few years ago were scarcely known in England outside of Kew Gardens. The British timber market lays under contribution every country in the world. The value of timber annually imported into this kingdom is about 16,000,000*l.*, and in London or Liverpool may be found the best stocks of timber ever gathered together in any city. From Europe we import some twelve or thirteen different timbers, from Asia about fifteen kinds, Africa twelve or thirteen kinds, North and South America something like fifty kinds, and from Australia and New Zealand six or seven kinds. While as yet there are no signs of that "wood famine" predicted by some, I think that we shall certainly be driven further afield for our supplies when quality is of more consequence than quantity. The United States have practically ceased the exportation of yellow pine, and now import immense quantities from Canada. The Baltic provinces appear to be simply inexhaustible in point of quantity (but how long they can maintain a supply of the better class of deals is doubtful); however, the huge timber industry of Russia, Finland and Sweden will for long insure us in England of having a supply of cheap timber. It is considered by

good authorities in the trade that many years will not elapse before lumber will be dearer in America than it will be in Europe, owing to the large yearly increase in the consumption in the United States and Canada itself. The forests of New Zealand, although comparatively small when contrasted with the huge belts of timber-land in North America, contain such a large variety of valuable timber trees that they must prove of enormous value in the near future. These forests are said to cover an area of over 20 million acres, about half of which are Crown lands and the greater part of the remainder is in the hands of the European population. New Zealand is so well watered and so well adapted to the growth of timber, that even when forests are cut down they soon reproduce themselves, but this is no excuse for the wanton waste which often takes place after trees have been felled for timber purposes. The forests are known to contain upwards of forty distinct varieties of timber trees, more than twenty of which are suitable for architectural work, cabinet making and many other purposes. Active steps to promote a large export trade are being taken by the Midland Railway Company of New Zealand and the Kauri Pine Company, Limited, who both possess most valuable concessions of excellent timber lands. For some years past kauri has been imported into this country, and shipbuilders, who are ever pioneers in the use of wood, have readily acknowledged its splendid qualities. Now it appears to me that if kauri (the most costly of the New Zealand timbers) can be imported here at a price enabling us to use it freely, I think the same might be done with many other woods, such as the red pine, black pine, totara, &c. This no doubt you will consider a matter for the timber trade to settle, but I think otherwise. Timber merchants naturally only supply what there is a demand for, but if architects had a better knowledge of the timbers of various lands, and inquired for them, no doubt we would soon have a large choice. Of course shippers will not send woods which are unknown to our profession, and which may have to lie in stock years before going off. The Colonial Exhibition, and now the Imperial Institute in London, will, I believe, do a great deal to help this forward, and the day may yet come when our middle-class houses will be fitted with natural woods and the paint-pot almost banished; this would be another step towards the "house beautiful." The indigenous forest of New Zealand is evergreen, and the general character of the woods resembles the growth of Tasmania and the Australian continent; most of the woods are harder, heavier, and more difficult to work than the European and North American timbers. They vary, however, very much among themselves, and are mostly very durable. The majority of the trees rise to a height of 40 or 50 feet before putting out their branches, a detail which insures the production of a large amount of clean, regular-grained wood of great size, an article which is becoming more and more difficult to obtain in Europe and America.

ROYAL CAMBRIAN ACADEMY OF ART.

THE annual meeting of members and associates of the Cambrian Academy was held on Saturday at Plas Mawr, Conway, and was largely attended. Mr. H. Clarence Whaite, who presided, was unanimously re-elected president, an honour he has held since the initiation of the Academy. In acknowledging his re-election, the President remarked that the position of the Academy financially and in point of membership and the growing excellence of its exhibits was most satisfactory. Mr. Cuthbert C. Grundy was re-elected vice-president, Mr. G. Swinford Wood and Mr. J. Pain Davies being appointed to the respective offices of honorary treasurer and secretary. The following artists were elected on the council:—Messrs. George Cockram, J. H. Cole, B. Fisher, B. Fowler, P. Ghent, Anderson Hague, R. G. Harrison, Leonard Hughes, J. Johnson, J. Clinton Jones, Joseph Knight, A. F. Perrin, Charles Potter, J. C. Salmon and W. Slater. Mr. John Finnie was unanimously elected a full member and Messrs. S. Sidley, Arthur Baker and G. Sheridan Knowles were elected full members from the list of associates. Messrs. Harold Hughes, Paul Knight, G. Hall Neale, Oliver Baker and Reginald Smith were elected associates of the Academy out of a long list of candidates. The receiving days for the exhibition of 1894 were fixed for April 27 and 28; press day, May 9; private view, May 12; the Academy being opened to the public on May 14. Messrs. B. Fisher, B. Fowler, P. Ghent and Anderson Hague were appointed the hanging committee, and Messrs. W. J. Slater and B. Fowler were elected honorary auditors. Messrs. Arthur Baker and Harold Hughes have the care of Plas Mawr, Conway, the home of the Royal Cambrian Academy, where the annual exhibitions are held.

M. Paul Delair, conservator of the Musée of Comparative Sculpture at the Trocadéro, Paris, died recently in his fifty-second year. In 1870 he published a volume of poetry, and several of his plays have been performed in Paris. He was for several years attached to the Department of Fine Arts.

NOTES AND COMMENTS.

A NEW chapter in the history of international relations appears to be opened by a proposal which has emanated from the Congress on the History of Art that was lately held in Nuremberg. The humblest student of that history does not go far before he has to suffer from incomplete information, and professors and specialists will tell him that after a life of inquiry they also are not acquainted with all the materials that are useful. It must be remembered that the investigation of the history of art generally takes the form of devotion to the works of a particular artist, whose reputation may be local rather than of universal interest. Sometimes discoveries are made which, being printed in the proceedings of societies, may be considered as buried. Italy furnishes innumerable examples of that sort of entombment for subjects that relate to the arts. What was advocated at the Nuremberg Congress was the founding of institutes which should contain materials for the history of art, such as books, essays, documents, drawings, &c., and especially registers and indexes from whence the student could learn what information was available and where it was to be found. Something of the kind was commenced at South Kensington when HENRY COLE began the publication of a catalogue of books and essays on art, but it is as well to be silent about the attempts that were made to realise his idea. The selection of the most fitting place for establishing the first Institute was soon determined. It was agreed that Florence was entitled to the distinction from its association with the history of art. To carry out the arrangements fifteen members were appointed as a committee, with Professors MAX ZIMMERMAN and SCHMARSON and Herr BAYERSDORFER as secretaries. Subscriptions will be received at the banking-house of MENDELSSOHN & Co., in Berlin (which was founded by the philosopher who wrote so eloquently about art), while books, drawings and other materials can be sent to E. A. SEEMANN, in Leipzig. The proposal may now appear premature, but sooner or later it will be realised.

A COPY of the will of the late Dr. AUBREY BOWEN, of Melbourne, has been sent to the trustees of Mason College, Birmingham. In it the testator directs that his trustees are to pay out of the income derived from his property to the trustees or other proper officers of the Mason Science College at Birmingham, in England, "the annual sum of 600*l.*, free and clear of all deductions, upon the condition, however, that the said trustees or other governing body of the said college for the time being shall, within a reasonable time, undertake to apply the same to the founding of six scholarships of 100*l.* per annum, each in connection with the said college, to be called respectively the first, second and third Bowen Scholarships, for the promotion of the study of metallurgy and civil, mechanical and electrical engineering, and the first, second and third Priestley scholarships, for the promotion of the study of chemistry; and I direct that the trustees or other governing body of the said college shall have discretionary powers to establish the regulations or conditions of the said scholarships and the qualifications of persons desiring to become candidates." The bequest is of the greatest advantage to the college, which is less wealthy than is commonly imagined. It will also serve as a sort of compensation for the outrage which the people of Birmingham committed on JOSEPH PRIESTLEY, when they set fire to his house, and destroyed his valuable chemical apparatus and manuscripts because he dared to approve of the French Revolution.

THE directors of the Grafton Gallery were fortunate in obtaining the loan of about a hundred paintings, drawings and sketches by the late ALBERT MOORE for their exhibition. They become more remarkable owing to the character of the foreign works in adjoining rooms. ALBERT MOORE, like his brother with sea-pieces, was able to gain success without much exercise of ingenuity in devising novel subjects. Two or three figures of young people half-clad were all he required, and with a little variation of posture, drapery or colour they served him for many years. But that variation was more satisfactory to the initiated than would be the most startling novelties. It is natural that a

collection of ALBERT MOORE's works should appear to be monotonous. It must be remembered that they were not produced under the supposition of forming a combination, for the painter did not anticipate that more than a single example by him would be seen in a room. The charge of monotony may, with as much reason, be applied to many a collection of Greek sculpture. ALBERT MOORE's works would sustain the companionship of that sculpture. He does not copy the faces, figures or drapery of the Greeks, but there is no doubt he endeavoured to realise the old forms in a nineteenth-century manner. His figures are English youths and maidens, although not clad in the garb of England. The works are by themselves sufficient to reward a visit to the Grafton Gallery. The foreign pictures are varied, and present some of the latest manifestations of the art of painting in France, Belgium, Holland and Germany. There are also several characteristic examples of the modern Glasgow school.

ONCE again the ruins of the Palais d'Orsay, where the Cour des Comptes was seated in Paris, are on the *tapis*. More than once the blackened walls, and the weedy spaces between them, have been formally made over to the Union des Arts Décoratifs, for the purpose of establishing a sort of South Kensington Museum, but the Union could never gain sufficient courage to start the works. It was also proposed to restore the building and use the rooms again for a Cour des Comptes, but the cost scared the French Government. The estimate by M. MOYAUX amounted to about 400,000*l.* Another scheme for restoration was prepared by M. PAUL DUBOIS, which it appears could be realised for less than half that amount. It has gained the approval of the officials as well as of several leading statesmen, and efforts are being made to obtain a grant of the money that is necessary for the works. M. DUBOIS has no desire to supplant M. MOYAUX. The latter has jurisdiction over the ruins, and M. DUBOIS considers he is entitled to have charge of any restoration of them which may be undertaken. There is no doubt the Palais is a blot which disfigures one of the Quais, and moreover it is a visible memorial of political madness. It is incomprehensible how the patience of the Parisians could have tolerated the ruins for over twenty years.

AT the present time people in Paris are confident that the new scene-lofts for the Opera House will be erected on the fortifications. All the official difficulties have been overcome. There is a large bastion known as No. 45 near the Porte d'Asnières, which appears to be well adapted to become the site of the buildings. As it has an area of about three and a half acres, there is sufficient space to accommodate the scene-painters of the Opéra Comique and the Odéon as well as of the Opera. The bastion is also accessible. The Boulevard Berthier bounds it, and scenery can be conveyed from it to the Opera House in about half an hour. There is direct tramway communication. Another advantage is that the ground is to be obtained without cost, and the sum which will be derived from the site of the buildings in the Rue Richer will go far towards the cost of the erection of the scene-lofts. It may seem odd to set up buildings of the sort on a fortification, but in case of war they could be used for barracks, hospitals, or stores. The advantage of M. THIERS's costly line of defence is, moreover, not generally admitted, and many competent judges consider the whole of the ground covered by the fortifications might be converted into building sites without increasing the danger of the capital.

HERR BEGAS, the sculptor who has obtained the commission for the monument of the Kaiser WILHELM I., which is to be erected in Berlin, has submitted his model to the Emperor. The reconciliation with Prince BISMARCK has affected the design. Instead of mythological and symbolic figures, the bas-reliefs will represent scenes in which the Prince and Field-Marshal MOLTKE will be introduced. The model in its altered state will be submitted to the Reichstag, but there is no likelihood that any objection will be raised to the arrangement which was inspired by the Emperor.

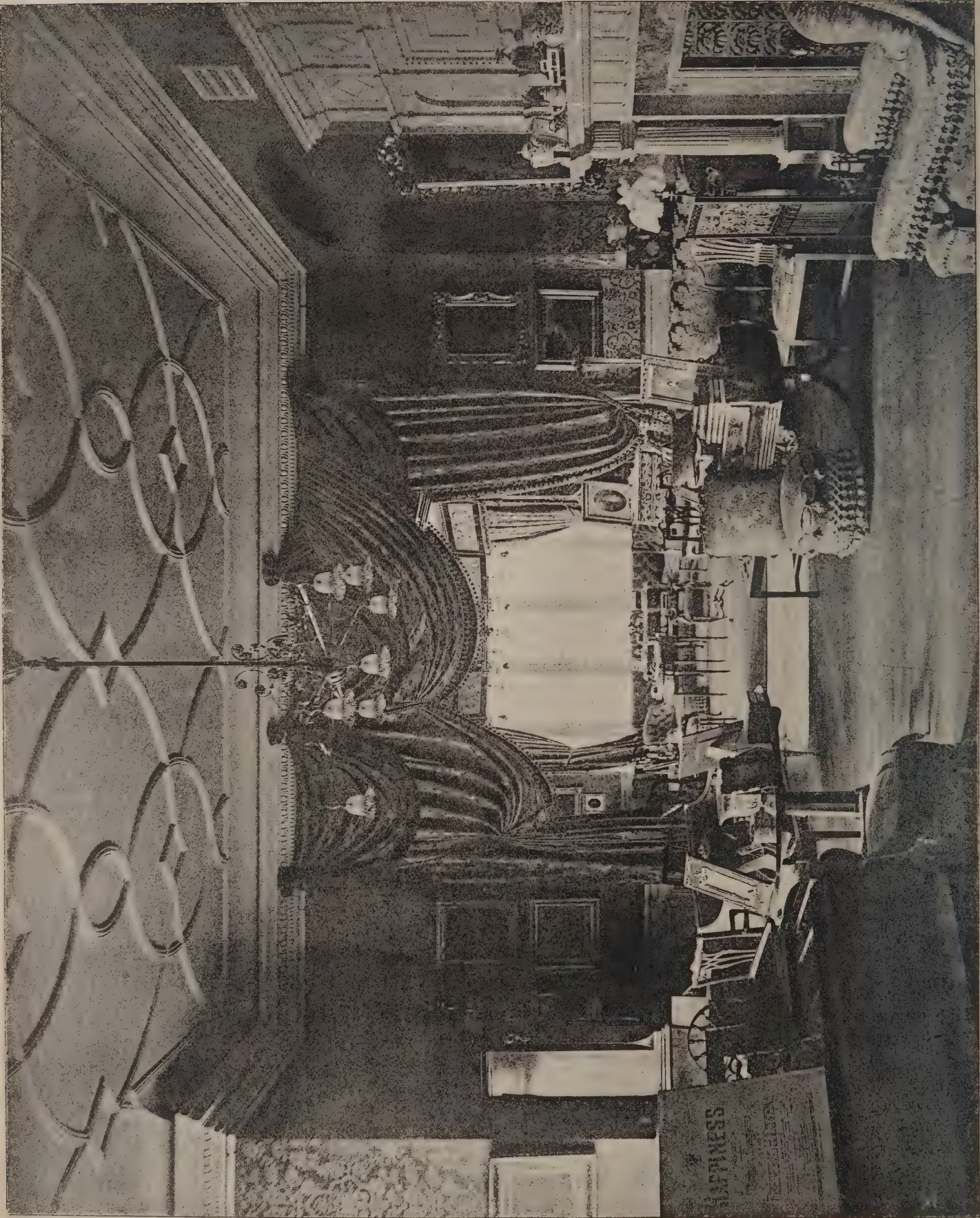


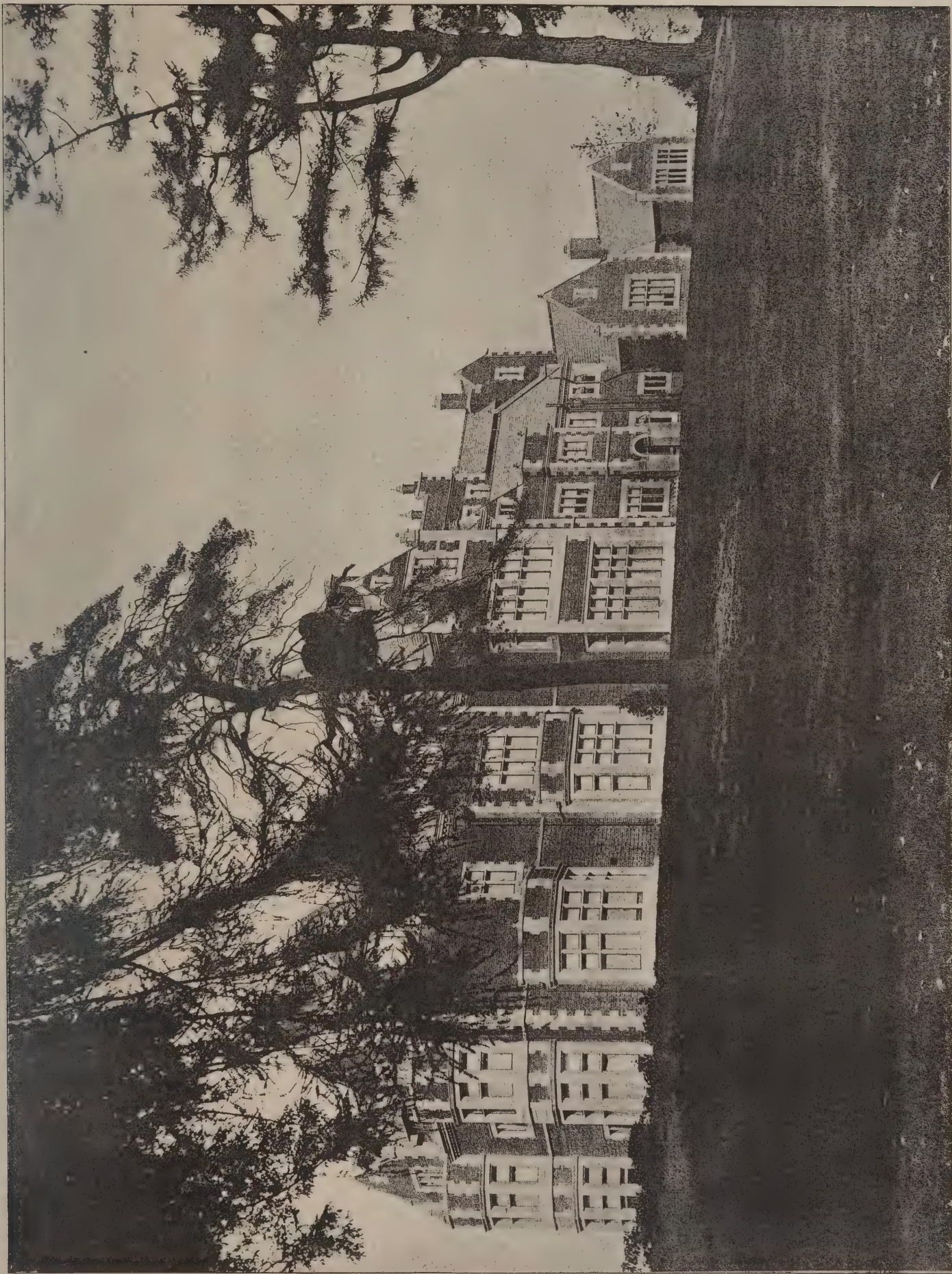
PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

PETTON HALL, NEAR BASCHURCH, SHROPSHIRE: INTERIOR OF MORNING & DRAWING ROOMS.
THOS. BOWER, ARCHT.



IN A PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

PETTON HALL, NEAR BASCHURCH, SHROPSHIRE: WEST FRONT.
THOS. BOWER, ARCHT. & CO.



IN A PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET, PETTER, AND E.C.

PETTON HALL, NEAR BASCHURCH, SHROPSHIRE: SOUTH-EAST FRONT.
THOS. ROWER, Architect.



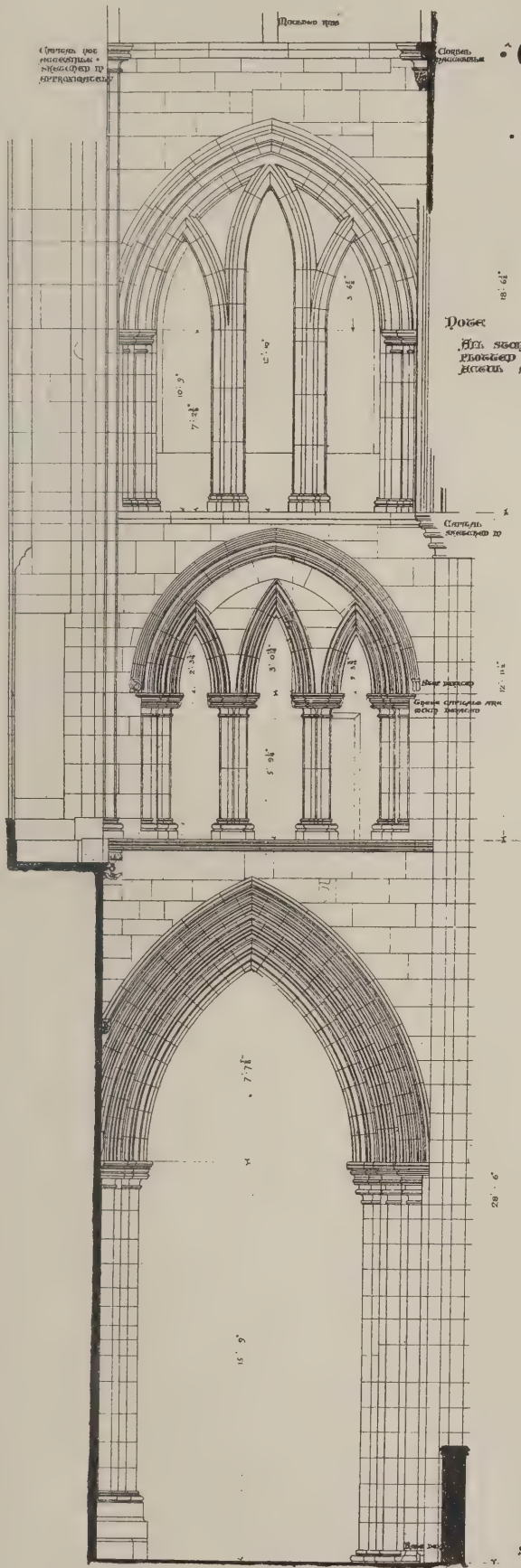
IN A PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

PETTON HALL, NEAR BASCHURCH, SHROPSHIRE: INTERIOR OF HALL.

THOS. BOWER, Architect.

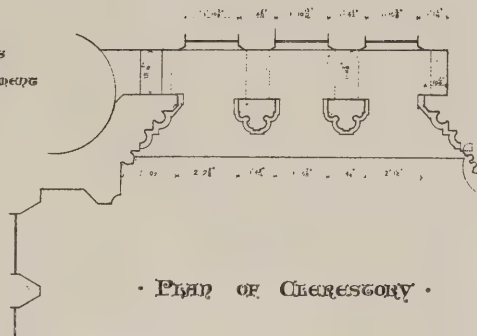
GLASGOW CATHEDRAL.

EAST BAY OF NORTH TRANSEPT.

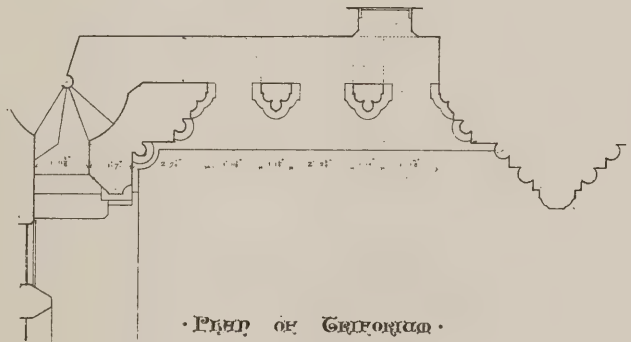


Elevation of Bay.

Notes:
The scope of the
drawing is from
the west end of the
bay to the east end.

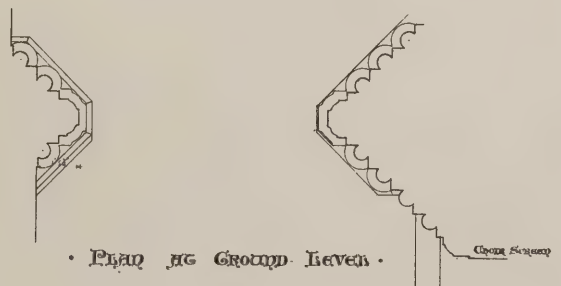


Plan of Chancel.



Plan of Transept.

Measured and drawn
by
James Ritchie, 1893.



Plan of Ground Level.

Scale 1/4" = 1' 0"

ILLUSTRATIONS.

PETTON HALL, NEAR BASCHURCH, SHROPSHIRE.

THIS house, stables and two lodges have been built in Petton Park for Captain ELLIS BROOKE CUNLIFFE. All fittings in the main parts are of Dantzic oak, dull polished. The electric lighting is by Messrs. W. LEA & SONS, of Shrewsbury, and is a very satisfactory work. Mr. THOMAS BOWER, of Nantwich, is the architect, and Mr. RICHARD BECKETT, of Hartford, the builder.

GLASGOW CATHEDRAL.

THE illustrations have been taken from drawings by Mr. LOCHHEAD, prepared in connection with the Summer Sketching and Measuring Class, held at the cathedral, as part of the training given to the students of the architectural classes at the Glasgow and West of Scotland Technical College (which will be resumed in April and will meet till October), under the superintendence of Mr. CHARLES GOURLAY, architect. The bay represented is one of the finest; the capital of respond on north side is earlier than that on the pier to the south, but the arch detail is of the earlier character. The triforium details are also early, while the clerestory appears to be of later date.

The following notes on the cathedral, prepared by Archbishop EYRE, are worth appending:—

SCOTTISH ARCHITECTURE.—Norman Romanesque, A.D. 1066-1154. First Pointed (Early English), Transitional, 1154-89; Developed, 1189-1286. Second Pointed (Decorated), English Character, 1286-1371; Scotch, 1371-1560.

XII. Century.—A small fragment at the south-west corner of the lower church, c. 1180, is all that remains of Bishop JOCELIN'S work.

XIII. Century.—The lower church and the choir above it were built by Bishop BONDINGTON, c. 1245. The choir was finished before 1280. The transept was built about the same time. The nave was finished about the end of the century. The central tower, below the belfry windows, was built before 1300.

XIV. Century.—The work of nave, aisles and transepts continued. Tomb of Bishop WISHART, at east end of lower church, was erected c. 1317.

XV. Century.—The north-west tower was built after the completion of the nave. The stone tower was begun by Bishop LAUDER (1408-25), and the spire was finished by Bishop CAMERON (1425-47). The chapter-house, the sacristy above it and the rood-loft were built between 1425-35.

XVI. Century.—The stairs leading to the lower church, the undercroft of the proposed south transept, and the altars in front of the rood-loft, were built by Archbishop BLACKADER (1484-1508).

The north-west tower, the original bell tower and the south-west tower, or consistory house and library, built c. 1350, were taken down in 1846.

It should be known that "crypt" and "lady chapel" are wrong names to give to the lower church and the east aisle.

MEASUREMENTS, &c.—*Cathedral.*—Total length, 319 feet; total width, 63 feet; length of nave, 151 feet; width, 30 feet; height, 85 feet; length of choir, 103 feet; height, 93 feet; east aisle and chapels, 63 by 28 feet; sacristy, 28 by 28 feet; height of spire, 225 feet.

Lower Church.—Total length, 125 feet; total width, 62 feet; height, under aisle, 20 feet; height, under choir, 15 feet; chapter-house, 28 by 28 feet; BLACKADER'S undercroft, 59 by 35 feet.

In Both Churches.—Number of windows, 157; number of pillars, 147.

The Triennial Exhibition of Pictures by the Stirling Fine Art Exhibition has just been opened in the Smith Institute. Four hundred and twenty-four oil-pictures have been hung in the large hall, and 270 water-colours, drawings and engravings in the small gallery, and there are also thirteen pieces of sculpture on exhibition, the works catalogued numbering in all 707.

THE ADVANCEMENT OF ARCHITECTURE.*

By GEORGE AITCHISON, A.R.A.

I BEGAN to prepare a course of lectures on Romanesque—the diagrams on the wall will show you how far they had progressed—but though I still think that the study of Romanesque is valuable in showing us how the savages who overran the Roman Empire progressed in architecture, I became convinced that a continuation of last year's lectures might be more useful. I said something about the value of architecture to mankind in my last course of lectures, but I shall go over the ground again, for unless students are convinced of the importance of their profession to mankind, they will hardly be impelled to give that time, energy and devotion to its study that its merits demand. I use the word devotion to express the frame of mind that each student should bring to the study of architecture, in the hopes of advancing it for the benefit of mankind; a devotion that must not look to profit, honour or fame in its pursuit, and only for that meed of pleasure which is spoken of by the poet—

There is pleasure in poetic pains that poets only know.

Actuated by this devotion, which is at once benevolent and patriotic, he will emulate those philosophers who devote their lifetime to the examination and recording of some phase in nature which it is probable some one else will use.

The architect is even less fortunate than the poet, for it is a rare case when the poet cannot get his poem published. It is, however, common enough for the accomplished architect never to have anything to build which can show his skill; for should he be greatly in advance of his age, it is almost certain that any drawing or model he presents for approval will not be accepted.

The higher energies of mankind are now mainly devoted to the elucidation of the problems of nature, and particularly to that grand problem of the ultimate atoms of which the universe is composed. These speculations were almost entirely abandoned during the early days of Christianity; necessarily in the dark ages and during the enforced ignorance of Mediæval days.

Since the revival of learning, philosophy has again started from the speculations of the Greek philosophers, whose last exponent was Lucretius, about 55 B.C. The modern philosopher, however, has all the new sciences, chemistry, light, heat and electricity to help him, as well as apparatus that more or less enables him to verify his hypotheses.

As "ignorance is the curse of God, knowledge the wing wherewith we fly to heaven," we should be grateful to the philosophers who pursue their profound studies with no hope of reward but the knowledge they gain, and who have shown us that nature proceeds by unflinching and unswerving laws, and that all we can know is from the investigation of our universe. Such studies, however, should not so completely absorb the best energies of all the greatest of mankind as to entirely turn away their thoughts from other things which should ennoble and delight mankind.

Some consideration of our universe is good for all, as a set-off to man's overweening pride. It is good to be occasionally reminded that to our universe man resembles the animalculæ in a drop of dirty water; still, it is not good for man to wholly dwell on his own insignificance, as it is too apt to make him regard his actions as of no importance.

That an ant should appropriate to his own use a grain of corn which it ought to take to the common store does not seem of much importance to us, nor to the world, though it is of vital importance in an ant-hill, and our ant-hill is this earth.

As regards man, it must still be affirmed that "The proper study of mankind is man." Anything we can do to discipline, raise and delight him with ennobling pleasures, is of more importance than to know the conformation of the circumambient ether. I consider that the triumphs of architecture do afford such ennobling pleasures to mankind, and I wish I could say with Sir Henry Wotton, that "Architecture can want no commendation where there are noble men or noble minds."

No one can expect to thoroughly appreciate even the outside shapes of fine buildings without having some cultivation, or some natural susceptibility to beauty. Although it may appear scarcely credible, yet it is true that there are people who are unaffected by the beauty of inanimate nature, and we can scarcely expect such persons to be affected by architecture, though this may not always be the case, as man, cultivated or not, is mostly more affected by the highest and most enduring efforts of man than by the works of nature, for the one implies genius, knowledge, skill, power and wealth, and the other seems but the spontaneous action of necessity. Those who do observe and admire the beauty of shape in rocks and mountains, in the sea and its shores, in trees, plants, herbs and flowers, would naturally admire the fine shapes of buildings. I

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should not like to affirm that fine buildings, even the most beautiful, exceed in beauty the finest things in nature, though I think they do; but they certainly bring home to us their relationship to man in the most charming and delightful way, and in a way that natural objects do not, however striking or beautiful they may be. When you see fine buildings in the midst of nature, it is like hearing your native tongue spoken in a foreign land. In walking on the other side of the Thames, by Cookham, you see a succession of all the beautiful and varied forms of the upper woods of Cliveden, and amidst them the outline of a pretty little pavilion, which goes to your heart at once, for it is man's work. In some respects, too, man's larger works exceed those of nature. Even in size, for as Mr. Ruskin has pointed out, there is no sheer plane in nature that equals the front of a large building. In that pinnacled plain near Amalfi, that at a distance is taken for a Mediæval town, the biggest rocks seem much smaller than Gothic cathedrals.

I believe the same is true of towers; there is no square isolated mass of rock that equals the bell towers of Italy, for though at Orkney the "Old Man of Hoy" is said to be 600 feet high, it is but a ruin. The effect of that mountain at Utah that is called the "Western Temple of the Virgin Valley," is said to surpass all description; and of course nature can deal with heights and masses that dwarf to insignificance the puny efforts of man. Yet nature's chisels—heat, frost, wind, rain and lightning—do not carve the mountains into shapes as dear to us as those forms which the genius of man has erected for our admiration. Blind force acting for ages beyond count on dead matter can never excite the same admiration as that due to high intelligence working for man's delight. Hints, however, for all sorts of forms and all sorts of arrangements are culled by genius from nature's works, but experience alone can show that these hints when worked up produce the desired effect.

We can never separate the visual effects from the mental rebound that tells us whether these things have been done by man to raise emotions, or are but the outcome of blind necessity. Still, we can only learn from nature's and from man's works, and as nature's are the grandest, we get from them the rough-hewn sources of emotion, while from buildings we learn the devices for producing such emotions in less gigantic works. Height, vastness and gloom, and the sudden change from dark to light affect us all, whether they be produced by nature's hand or by man's. Yet the thought of the power and originality of so small and feeble a creature as man does much to enhance the value of his colossal works. Various and striking are the effects and innumerable are the beauties that can be seen in nature, and that can by the efforts of genius be used in man's work. Most persons when they look from a sunlit glade into a forest are delighted by the view of the numberless and vast branchless boles gradually lost in grey obscurity; there is always a thrilling feeling of sublimity in looking from the light into the impenetrable darkness of some cavern's mouth, and both these motives have been seized on and utilised, the former in the porticoes of Greek temples, and the latter in some of the vast porches of Gothic cathedrals, Coutances, perhaps, affording the finest example.

In architecture there is a recurrence, a symmetry, a rhythm, an ordered alternation of light and shade, of flatness and projection, and a delicate proportioning, that produces in us a calm feeling of delight; there are, too, the repeated alternations of contiguous light and shade that excite the eye, contrasted with smooth surfaces that give it rest, and in the occurrence of varied and contrasted forms that make the æsthetic part of architecture particularly taking; but it is a vague and indefinite delight, like music without words. As far as I can recollect very few writers have noticed this special æsthetic charm. Madame de Staël is one of the few writers who has felt this charm. There is a passage in her "Corinne" that well expresses it, and that is almost unique in literature. When Corinne is standing by one of the fountains of the Piazza, and looking at St. Peter's, she says:—

"Painting and sculpture mostly imitate the human form, or, at least, some object in nature, and therefore awaken in our soul perfectly clear and positive ideas; but a beautiful monument of architecture has not, so to say, any determinate sense; in contemplating it one is overcome by that reverie without calculation and without aim which leads the thoughts so far. The sound of falling waters induces the same vague and profound impression; it is as uniform as the building is regular. 'Eternal movement and eternal rest' are thus brought together. In this place, above all, time is without power, for it no more stills these gushing waters than it moves those motionless stones."

Architecture, however, tells other tales besides producing vague emotions of delight; it tells of a nation's desire to perpetuate by monuments its feelings of adoration, its admiration for the glory it has achieved, or the grandeur it has attained. These desires have in past time evoked the genius of the architect and have enlisted the labour of the thousands of toilers

to embody his conception in hard and ponderous materials. Every vast monument expresses the desire of a nation to devote some of its earnings to the embodiment of an ideal, or at least its contentment that this should be done; for no tyrant exists, or ever has existed, except by the acquiescence of the bulk of those he rules. The heavy tax laid by Justinian on Constantinople to build Sta Sophia at least shows his people's acquiescence, or he would have been hurled from the throne. A philosopher says all the reward and immortality of the unknown labourers at the Great Pyramid are enshrined in its stones.

Architectural monuments not only keep alive the memory of dumb nations—for without them what would now be known of the greatness of Egypt, Assyria, and Persia?—but their monuments afford a measure of their wealth, power and greatness, and give us the most concise compendium of the cultivation they had reached. It is therefore of the utmost importance that architectural monuments, besides their impressiveness and grandeur, should express the taste, feeling and skill of the nation at the time of their building, and not be copies or paraphrases of former buildings. We should be as proud of what we can do as Touchstone was of his bride:—"An ill-favoured thing, sir, but mine own, for rich honesty dwells like a miser, sir, in a poor-house; as your pearl in your foul oyster."

However admirable the architecture of former times, of other people, or of foreign climes may have been, I trust that neither the architect nor the people want to be like the "jackdaw with the peacock's feathers"; but, besides this, if the architecture we paraphrase was of other climes, it cannot be proper for this climate; if it was that of other nations it cannot exactly represent what ours should be; and if it were of former times it would still not represent what we now feel or most admire.

A passion for the newly-advanced geometry was one of the characteristics of the Saracens and Mediævals, but now nothing can be more nauseating in the imitation Gothic of the day than the geometrical figures with which it is overlaid, for these only remind us of a child's efforts with a pair of compasses. If there is no desire for beauty in the people, and no original skill in the architects, it is at least honest to have a dead wall with holes in it than the most brilliant fancy dress in imitation of other tastes and other times.

Some day, when investigators have found out the diagnosis of architecture and sculpture, the capacities of a nation will be as clear to them from its architectural remains as the shape of an extinct creature is to an anatomist from the fragments of its bones. Most of us have wondered what the minds of the barbarians were like who carved on their churches those ornaments that look like the flock of geese Baron Munchausen captured with his line and eel.

The obtrusiveness of architecture is another of its characteristics, and not the least important one; buildings are not like books, statues, pictures or musical instruments, that can be hidden away. In towns they meet us at every step, and compel some attention, even if it be but momentary. However small buildings may be they take from us some light, some air, and the prospect; so they are not merely to be looked on as useful things for the occupier, but as things that owe everyone a debt for what they have deprived him of, and must be made slightly if not comely. There are, however, exceptions to this rule, in the case of erections built by society to awe or terrify us—like police stations, law courts, prisons and the gallows. Those buildings which dominate towns and have been built for some noble or grand purpose should declare their use. It is needless to point out their obtrusiveness, when astronomers tell us that if our side of the moon be inhabited, it is not by a race of great builders, for the telescope would reveal anything built there that was as high and as big as St. Paul's.

The building of a vast structure, even of an immense feature involving a forest of scaffolding, huge heaps of material, and thousands of workmen, naturally impresses the people; so we read in books of the time, of the domes of Sta Sophia, Sta Maria del Fiore, St. Peter's and St. Paul's being called "mountains." We must consider, too, the effect that vast and magnificent buildings have on foreigners, and the notions they get from them of the greatness and civilisation of the country, not to speak of the wealth magnificent buildings bring by the influx of visitors. Vast and magnificent buildings possess another power, which is not, however, pleasant to contemplate—the sort of limited immortality they confer on great nations that have perished. Even the ruins of such buildings speak of its former wealth, greatness and cultivation, and engender visions and regrets, as well as affording permanent records of the place where the great nation had its home. Books, pictures, statues and other movable works of art become either the property of the world or of the nation that possesses them. It requires an effort of the mind to refer them back to their native country, but the ruins of fine monuments fix the locality, and cannot be dissociated from the place.

The mind, too, seems more ready to transfer the isolated works we have seen elsewhere to the buildings we are contemplating. The ruins, too, of fine architectural works form a school for the barbarians who have settled there, and may eventually be the foundation for a new style.

Every building is so intimately connected with man that it must be noticed by the poet, the writer and the painter; for except in the cases of battles, some building mostly forms the background to the most striking actions of man's life. Besides, the importance, the grandeur, the beauty or sublimity of monuments has always made them favourite subjects for introduction by the painter and the poet. It would be difficult to find a poet not purely pastoral or didactic in whose works admiration for fine buildings is not expressed, from Homer's description of the metallic palace of Alcinoüs to the Palace of Art of the late Poet Laureate; though he unfortunately lived in the days of the Gothic revival.

The great poet of the Middle Ages, Dante, was born in 1265, just after St. Louis was defeated and taken prisoner in the Seventh Crusade.

Considering that Gothic was invented less than a century before Dante's birth, one cannot help thinking that, had he been much in France, he must have been forcibly struck by the wonderful buildings in the new style, and have written about them, even though his model, Virgil, took little notice of architecture. The great progress then made in Italy was, however, in sculpture and painting, and these were evidently the arts he most admired, for he composed in words charming groups of sculpture for the walls and pavement of the ascent to purgatory. He was, however, such a keen observer, that he makes a simile of the burdened souls in purgatory from a corbel.

As to support incumbent floor or roof,
For corbel, is a figure sometimes seen,
That crumples up its knees unto its breast;
With the feign'd posture, stirring ruth unfeigned
In the beholder's fancy; so I saw
These fashioned when I noted well their guise.
("Purg.," can. 10, l. 130-135. Carey's translation.)

Chaucer, however, our fellow townsman,* who was born in 1328, seven years after Dante died, and who lived till 1400, was both an observer and an admirer of architecture, and describes buildings in many places rather minutely; and though his English is occasionally difficult to understand, and his verse quaint and rugged, there is a charm about it. So I give you his description of the "House of Fame":—

All was of stone of berile,
Both the castell and the toure,
And eke the hall, and every boure,
Withouten peeces or joynings,
But many subtell compassings
As babewinnes and pinnacles,
Imageries and tabernacles
I saw, and full eke of windowes,
As flakes fallen in great snowes;
And eke in each of the pinnacles
Weren sundry habitacles.
(Chaucer, "House of Fame," lib. 3, v. 93)

I may say that "babewinnes" are baboons. The writers of the Middle Ages irreverently called grotesque Gothic sculpture and painting "baboon work."

The architectural descriptions in the poets, even including Wordsworth's Vision, mostly contain only a few vague terms; costliness of material mostly doing duty for beauty of design, which, after all, cannot be properly dealt with in words. Milton's language is, however, so sublime that we can well bear his description of Satan's golden Renaissance palace:—

Anon, out of the earth a fabric huge
Rose like an exhalation, with the sound
Of dulcet symphonies and voices sweet,
Built like a temple, where pilasters round
Were set, and Doric pillars overlaid
With golden architrave; nor did there want
Cornice or frieze, with bossy sculptures grav'd;
The roof was fretted gold.

("Par. Lost," lib. i. v. 710.)

If all the architecture were to be erased from sculpture and painting and blotted out of literature, what gaps would be left in pictures, bas-reliefs and books. Think how bald even the "Arabian Nights" would become without the architectural surrounding of the stories. So I think we may consider that architecture fills a good space among the achievements of mankind. Is it not well worth the devotion and striving of the architects, the aspirations and efforts of the students, to put it once again into the way of improvement and progress?

Although architecture now brings no honour, glory or fame, mankind may again turn to admiring it, as at former epochs. Future architects may become as famous as Ictinus, Callicrates and Mnesicles, as Anthemius of Tralles and Isidore of Miletus,

* He is said to have been a Londoner.

as Giotto, Brunellesco or Bramante, as St. Gallo, Palladio or Wren. We must, however, admit that Milton was right when he called fame "that last infirmity of noble mind," for truly the world has received as much instruction and delight from the work of nameless Roman, Gothic, Saracen and Renaissance architects as from those who stand in the temple of fame. Building we could scarce do without, to protect us from the weather and from robbery, to stow our goods in, or to work up our materials, unless we fell back into primitive savagery.

If we pretend to any culture, we want our commonplace buildings to have character and comeliness, and those for noble purposes to raise strong and adequate emotions, for if all buildings were wholly and purely utilitarian, it would be like exchanging oratorios of the great composers for the din made by the rivetting of iron ships.

All the fine arts are necessarily progressive, but their strongest appeal to us is when they portray the emotions of the day. Sir Walter Scott pointed this out in his "Waverley Novels;" he said that he had made all the accessories as true to the time as he could, but not the personages, for had they represented the real persons no one would have cared to read the novels. To make his personages interesting they spoke, acted and thought like those of his day, and this is true of every fine art. There was a simplicity, a directness, an intensity and a dignity about all the historic personages of Greek times that has made antique poetry, eloquence, sculpture and architecture unsurpassed and possibly unsurpassable. The artists—and under this name I include the poets—of to-day have to deal with people who are feebler and less dignified, but more varied and complex than the ancients; but now, as then, existing personages must be the actors, and must be made like life, or their works must appeal to present emotions, or they do not interest us. As long as noble qualities, character and beauty exist in nations I believe there will always be artists to express them. The art of expression is mainly learnt from the past, but the artists must be animated by the spirit of the present. The cause of Tennyson's works being so highly valued and so widely spread amongst the English-speaking race, is, apart from their harmony and beautiful diction, due to their being imbued with the knowledge, thoughts, feelings and aspirations of his day. There have been times of brutal barbarism, there have been times of vileness, corruption and cowardice that could give rise to no poetry. Architecture only deals indirectly with man; it has to meet some of his necessities, habits and artificial wants, and æsthetically to move those emotions that are proper to the uses of the building.

If any fine art had ever arrived at a perfection that would be appropriate for all purposes and for all time, that art would be done with—there could be nothing more to express, and we could but apply the stereotyped form to what we want. This perfection has by no means been reached in architecture; it is difficult to see how it ever could be reached while man's wants and knowledge progress and his tastes change, though unhappily we too often act as if this were the case. We have many new necessities, thousands of new wants, and many new materials that must have new proportions and somewhat new forms, and certainly new methods of construction. We have new beliefs, new knowledge, and I think I may safely say new hopes and new aspirations, though these hopes and aspirations may be vague. It can hardly be said that we have availed ourselves of all these changes from the past, though we may be slowly working to bring about a very different order of things in architecture. Those who are familiar with the ways of nature know that the gradual subsidence, or the gradual elevation of parts of the earth's crust are usually too small to be observed until the lapse of centuries. All we can say about architecture is that it has received in our time no sudden and immense development; it has not been affected by one of those tremendous volcanic eruptions that has suddenly changed a level surface into a mountain, like that which, in Renaissance days, filled up the Lucrine lake.

In the very early Renaissance days there were apparently but few architects in Italy, and the scholars, antiquaries, goldsmiths, painters and sculptors thought they had found perfection in ancient Roman architecture, and in the precepts of Vitruvius; in consequence, architecture then ceased to be a progressive structural art. We have not altogether shaken off this Renaissance fallacy, although we have several times changed the model; Greek, Gothic and the Dutch Renaissance have successively been held to be the acme of perfection.

My object is to consider if architecture can get into a progressive state again, and, if possible, how it may be done. I could fill the whole of my lectures with the facetious diatribes of non-professional writers against modern architecture and architects, if I thought any benefit would be gained by so doing. All architectural archaeologists know the slow evolution of the different architectures, now called "styles"—an evolution that it has mostly taken many centuries to effect. Yet these critics write as if they thought it was mere sloth or perverseness that prevented clever men from inventing new

styles in an hour, a day, a week or a month. So the main use of such quotations would be to show the critics' ignorance; and even if it showed a real and earnest desire in the country for something new, it would only illustrate the theory of political economy—that it is the supply that creates the demand, and not the reverse.

We must, however, admit with due regret that as yet there is no architecture in Christendom that in our eyes can be called good, true and distinctive of the present century. All those engaged in rapidly progressive fine arts have treated with contempt the work they have surpassed, as men of science do exploded theories. The Greeks at their apogee used their old statues as rubbish to fill up holes; the Mediaevals used carved Norman stonework as raw material and carved on its back, and the Saracens did the same with some of their carved woodwork; while such is our humility that a large portion of the profession is engaged in restoring old buildings or in building imitations of the past. The same may be said of some of the sculptors and painters in regard to Gothic statues and stained-glass.

If we wanted any confirmation of this we have only to look at a modern architectural guide-book to an English town; we shall there find the different buildings described as Greek, Roman, Byzantine, Romanesque, Saracenic or Moorish, Norman, Early English, Geometrical, Perpendicular, Tudor, Elizabethan, or Renaissance. To get a popular opinion of the absence of any distinctive style of the day, you have only to tell anyone that no past style should be used, and he will ask, with well-marked surprise, what can be done if it be not Classic, Gothic or Renaissance? This, perhaps, is not the worst phase, for not only is the architect looked on by the public as a supplier of old fancy dresses for buildings, but too many architects are of the same opinion. The architect, in too many cases, is believed by the public to be like a comic actor, whose business it is to parody all the expressions of former national character—from Greek to Chinese—and not to give expression to our own.

Archæology is a charming science, of great interest to everyone, and of the very highest importance to the historian; but it is not only not architecture, but when it is used as a substitute, it is fatal to it. Progress is the watchword of architecture, but with the archæologist it is the unpardonable sin. The architect's business is to improve on the past, the archæologist's to reproduce it, no matter how bad or ugly it be. The architect's canon is, that every part of a building is to be good in itself, and help to produce the proper effect. The archæologist's canon is to have precedent, *i.e.* that the modern building has been taken direct from one built ages ago. The architect of those days may have been ignorant, may have bungled, may have spoiled his building, but the archæologist is satisfied, perhaps delighted, if you can exactly reproduce these bungles.

It is surely worth the deepest thought, earnest and vigorous striving and strict self-denial to get architecture again on the line of progress, if it be possible. I by no means say that it is possible; for the wheel of fortune turns, and science, that in Mediaeval days was in the mire, is now at the top of the wheel, while art is in the mud; we have, however, this advantage over the Mediaevals, that whether we be successful or not, we shall not be burned alive for trying, though we may starve. Even when to be suspected of dabbling in science meant the chance of the dungeon, the rack and the stake, the votary of science would study it. We have, too, some encouragement for trying, for Greek art and Greek science flourished together.

Democritus, the founder of the atomic theory, was a contemporary of Phidias, and Epicurus lived in the days of Alexander the Great, when the Temple of Diana of the Ephesians was rebuilt by Dinocrates. As far as I know, there is no *à priori* reason why art and science should not flourish together, although in later times we know they have not. We should now think it absurd for eloquent writers on science to advocate the worship of the rushlight, when we have the Argand lamp, gas and the electric light; but in art we are in that unhappy position, that some of the highest eloquence of the day is devoted to the worship of the rushlight, and to the prophecy that it can never be surpassed. The eloquence we want must dwell on the inestimable benefits architecture confers, and should point to the invention of the electric light as an instance of what well-directed effort has attained. A fixed idea that no advancement can be made is fatal to all progress. So long as Ptolemy's theory was accepted as the ultimate truth, no progress was, or could be, made in astronomy; but when Copernicus, Kepler and Galileo investigated the matter, they proved that the earth was a spheroid that revolved on its own axis and round the sun, and since their day, not to speak of Newton's discovery of the law of gravitation, the knowledge of astronomy has been constantly increasing.

All the architectures that we now call "styles" could never have come into being if each nation had determined that Greek architecture was perfection, and no improvements in arrangement, construction or æsthetics could be made. With considerable gaps there was a regular advance, at least in construction

and arrangement, from Greek to Mediaeval times; it was left to the Italian artists of the Renaissance to start a belief that Roman architecture was perfect, and that all mankind could do was to try and restore it, with the effect that architecture has hardly moved from that day to this. Many observers have been sagacious enough to see that architecture is practically stationary, though the fashions have been constantly changing; but it was only quite lately that the reason, or one of the reasons, for this has been discovered—that is, that the method was wrong. The Gothic revivalists were eloquent enough, and brought the fiercest invective to bear on the Roman and Greek models; but while they advocated the change of model, they were quite contented with the method.

The question is, How are we to get the genius, capacity, skill, knowledge and taste, if there be any taste, of the present day, mirrored in our architecture? It is true we have the sculptors and painters to help us, but they can give us nothing of the present but animal and vegetable life, for the clothing of the day and the attitudes and groupings of the people are neither sculptural nor picturesque.

As regards architecture itself, we must, I think, make up our minds what we want, and these wants are twofold, material and intellectual. Let us take the material wants first. Do we want a high-pitched roof for snow to slide off? or a moderately pitched roof for rain to run off? or a flat roof? If we have a flat roof we cannot reasonably have a gable, and perhaps not a cornice. It is difficult to say whether a dome is to be looked on as a material or an æsthetic want. In a hot climate a dome not only gives increased air space, but looks as if it did, and may be useful to let in light high up, though a lantern will generally answer both purposes. It has been stated that this Byzantine feature was adopted by the Saracens as reminding them of their umbrella-shaped tents, which, if true, is an æsthetic reason; but as to whether the dome is wanted to be best seen from the inside or from the out, is certainly an æsthetic question. If it be wanted to compose with the inside it forms no striking external feature, while if it is to be an external feature it will not compose with the inside. You merely see a gap until you are under it and look up.

Everything that is palpably unreasonable in a building is a blot. We can, to some extent, by care and knowledge, arrange that we have nothing wrong in constructive shape, in area, or in arrangement; but all this I fear will not produce a building that raises high emotions; but on the other hand we know what emotions the use of most buildings ought to evoke, and that is something. It is obvious that if we were to follow a strictly reasonable method, without any thought but for utility, we should probably produce buildings that were very different from the existing masterpieces of architecture. Nature in making everything purely for use, makes most things shapely and occasionally makes them beautiful; but we by no means have nature's gifts in this respect. If we used, as we must eventually use, iron and steel for those parts which are to bear great weights, great strains, or to bridge wide spans, and made the ironwork visible, we should not only find that these materials would take new shapes, but must give rise to new ordinances. Iron, pycnostyle, systyle, eustyle and aræostyle, would be very different to those of marble columns with marble architraves. Shapeliness in iron must be reached by new proportions, and its enrichments must be different from those in marble on account of the exigencies of the material. Horizontal girders being the most convenient form that iron will take, vaulted ceilings will be superseded by flat ones, and flat roofs will be substituted for high-pitched ones.

All the large iron buildings yet put up have been merely for temporary or commonplace purposes, and have mostly been rapidly and cheaply done to meet some sudden requirement. They have not been called for by the nation for the purposes of magnificence, or for the highest ends to which buildings can be devoted, and so have scarcely entered the pale of æsthetic building. Sheds for the mere protection from the weather of people, animals, trees, or goods are not wanted or expected to raise any high emotion; but if, as we all hope, the whole bulk of the people improve as much in intelligence, morality and cultivation as they have materially, we may look forward to vast structures, not only "built for pleasure and for state," but dedicated to still higher purposes. When we have so wonderful a material as iron to our hand, the mind almost shrinks from contemplating the possible sublimity of buildings designed for the nation by the highest talent, and for the purpose of exciting the highest emotions. We picture to ourselves their colossal size, their novelty and beauty of shape, their perfection of composition, and the exquisiteness of their detail, glowing, too, with the colours of enamel, while each building is gloriously adorned with sculpture and painting. Even now the inside of the Crystal Palace is one of the most striking buildings in the world, although there was no attempt at building anything beyond a vast greenhouse.

I have the greatest possible confidence in the rising architects of the day—they be not led astray by false teaching or

demoralised by the desire of becoming rich. They have seen by travel many of the past triumphs of our art, and by photographs almost all the existing architecture in the world. They have in one respect distinguished themselves above the students of all other professions by their thirst after knowledge; for they have not only taxed themselves to get it, but organised the only complete architectural school in the kingdom. As far as they know how, they have used every exertion to acquire that deep and varied knowledge that is wanted for the most exacting profession that exists.

I doubt if the world has ever seen a failure when all have been striving to do their utmost, and it is at such times that genius mostly makes its appearance. Themistocles emerged between the first and second attempt of the Persians to conquer Greece and Publius Cornelius Scipio in the high tide of Hannibal's conquests.

If it be allowed to compare the present condition of architecture, of architectural aspirations, and of architectural instruction, with another time and a different desire, it may be said that Italy in the thirteenth century was precisely in the position that English architecture is now, for then throughout the length and breadth of Italy each poet studied all the poetry he could find, and strove to create a language in which he could enshrine the stirring thoughts and actions of his time, and eventually Dante appeared. It was at the end of such a time, among a galaxy of poets and playwrights, that Shakespeare was born. If our nation continues to cultivate the virtues of wisdom, courage, temperance and justice, whose practice has carried it so far, we may hope that it will shortly want splendid buildings for the noblest ends, and if the architects and students are still as eager, energetic and persevering as they now are, that the great architectural genius will shortly arise who is destined to carry architecture on its new path, that by that time the nation will have seen the supreme importance of architecture to mirror its greatness, its virtue and its culture, so that he may be able to create buildings worthy of his genius, and to found a school that will give to the world a succession of buildings of a vastness, an impressiveness and an exquisiteness that will cast into shade and insignificance all the architectural triumphs of the past.

STRUGGLES OF ENGLISH PAINTERS.

ON Saturday evening the prizes won by the students of the School of Art, Clapham, were handed to the students (in the absence of Mr. John M. Swan, A.R.A.) by Mr. W. L. Thomas, R.I.

In his address Mr. Thomas said:—You doubtless feel disappointed, as I do, that Mr. Swan—who has recently been so deservedly elected an Associate of the Royal Academy—has been prevented by illness from attending; but I will ask you on this occasion to be so kind as to join the band of enthusiasts who are in the habit of regarding their geese as Swans. Now, I confess that whether I take note of the high honours—I may say the extraordinary honours—fairly won by this art school, or whether I notice the all-round excellence and beauty of the drawings shown in the next room, I am fairly puzzled, and feel inclined to rub my eyes and see if I am really wide-awake in the old town or suburb of Clapham. Why I remember—we all remember—that for many years novelists, from dear old Thackeray downwards, writers of plays, “society” journalists, and penny-a-liners, when inventing and describing some particularly narrow-minded individual, or family of individuals, without a scrap of knowledge or sympathy with art, always located them at Clapham, or sometimes for a change at Brixton. Now, if those who sneer at this side of the Thames would take the trouble to cross the river and try to discover our numerous beauty spots it would be a revelation to them. Let them begin with a peep even at Battersea Park in early spring. Let them show me any view near London to compare with the lovely landscape effects to be found on those grand old commons of Streatham, Wandsworth, Mitcham, Clapham or Tooting Bec, or the charming picturesqueness still lingering around the old private grounds and gardens in this neighbourhood. This leads me to wonder whether your success is due to these beautiful surroundings or to the enthusiasm and artistic ability of many of our neighbours, men of active business habits, men like your Urwicks or Bristowes, or is it owing to the perseverance, the long-sustained note, I may truly say the high note, struck by our Nightingale (the head master)? Before distributing the prizes I must congratulate the students on their excellent work, particularly those who are not winners, for, depend upon it, it is better to be low down in a clever class than be high up among a surrounding of mediocrity. All the advice I can give to the students is contained in two words, “Take pains.” Every successful artist I know has gained his position, and held his position, when gained, by taking pains. A few instances occur to me within knowledge. Professor Herkomer has himself described, in his own vivid way, when he was desperately poor, spending his last

shilling in paying a gipsy to sit for him for detail of a small drawing on wood to make it as perfect as possible, and has described the delight he felt as he skipped down my stairs, three steps at a time, when he found his drawing had been accepted. I remember also the infinite pains he took over a pencil drawing of some Chelsea pensioners in church, which, as you know, he afterwards painted, and which, when exhibited in Paris, astonished our Continental neighbours, who, until then, never believed in the existence of a British school of painting. Then, again, all the French artists admired intensely the work of Charles Keene. Such consummate power in a few lines, they said. Ah, but the pains taken over each line; every one from nature. I often used to see him when he couldn't afford, or fancied he couldn't afford, to pay for a model, posing himself by the aid of a large mirror. One day he sent me, with a letter of introduction, a good-looking youngster, pale, delicate, French in appearance, but speaking perfect English. He made his first drawing for me, for which he received the magnificent sum of one guinea. With that guinea, he told me only the other day, he bought an illustrated edition of Longfellow's Poems and presented it to a young girl who afterwards became his wife. Her acquaintance you all have made, and her children, too, in many a graceful drawing by George Du Maurier. Again, take the career of Luke Fildes, the famous painter of the *Casuals* and *The Doctor*, who, I may confide to you, has surpassed himself in a work just completed, which, I venture to say, is the most beautiful rendering of a most lovely subject—a portrait of our Princess of Wales. What was the beginning of his triumphal career? Why, copying in black and white artists' pictures for wood-engravings. He simply did that work better than anyone else I could find, from the admirable training received in an art school similar to this. I won't detain you longer. I know you young ladies must be anxious to dance. Only let me warn you, if you wish to succeed in art, shut the door against that young scamp always interfering; you know whom I mean, the chubby young person whose full dress is a pair of wings and a bow and arrow.

DURHAM COUNTY BUILDINGS.

A QUARTERLY meeting of the Durham County Council was held last week, when a report from the Finance Committee was presented. On the subject of county buildings it said:—

With reference to the resolution passed at last Council meeting authorising the purchase of a site in Old Elvet, we have further considered the subject of new county buildings, and recommend as follows:—

1. That the offices in the new buildings be placed entirely on the ground floor and first floor, and that the basement and third floor, if any, be reserved for storage purposes, laboratories and caretaker's rooms.
2. That the new entrance to the headquarters of the county constabulary shall be by a road at the east end of the new buildings, 20 feet wide.
3. That designs for the proposed building, at an estimated cost of 30,000*l.*, be advertised for, and that premiums of 200*l.* for the best, and 100*l.* for the second best design be offered.
4. That the premium awarded for the best plan shall be deducted from the architect's commission if he be employed to carry out the work.
5. That the architect employed to carry out the work shall be paid a commission of 5 per cent., to cover all his travelling and other out-of-pocket expenses.
6. That the county surveyor do prepare instructions to competing architects, and submit them to us, and do afterwards advertise for competition plans to be sent in by June 30 next.

Mr. Brown moved that the paragraph and recommendations referring to the proposed new county buildings be eliminated from the report. In a recommendation involving an expenditure of 30,000*l.* or 40,000*l.* the Council had a right to expect that the Finance Committee had given it their full consideration before sending it to the Council. No plans were produced showing what accommodation was required, nor had the full committee an opportunity of considering the matter. It was not stated whether there was to be a public hall or not, but after the committee meeting he had, by the courtesy of one of the officials, an opportunity of seeing a sketch plan of the proposed new building. That plan even was never before the committee. He would modify his amendment so that the paragraph referred to might be held over for consideration by the Finance Committee before the latter pledged itself in the matter, and again brought it forward for adoption by the Council. He was heartily in favour of building new county offices and a county hall, but deprecated the hasty manner in which this report had been put forward.

Mr. Bartlett seconded the amendment, with regard to which he would have been more glad had it been for the omission of

the paragraph. There were many considerations why it was necessary the matter should be deliberately gone into, and why the Council should resist the action of any particular member to rush a question of this kind through with undue haste. The committee had not even considered the accommodation of the buildings it possessed. It was possible that by a small expenditure of money they could adapt the buildings they had secured to meet the interests of the Council until the measure now passing through Parliament had become law, when they would be much more likely to know what their future requirements were likely to be.

The Rev. A. D. Shafto said he was in the unfortunate position of having to defend the report. It came to this that they went to a very large expenditure in securing a site on which to build county offices and a council chamber. Their action seemed to him to be very like the man who bought a very valuable horse and then resolved that he would never ride it. There was not the slightest doubt that county offices were required. Their offices were scattered all over the town, and that court was not a suitable place for the Council to assemble in. Its acoustic properties and situation were bad. He had not the slightest objection to this matter being referred back to the committee for further consideration.

Colonel Gregson asked how it was proposed to raise this 30,000*l.*; was it from the rates or by a loan? During the last two years the county and asylum rates had doubled to what they were in the first three years of the existence of the County Council.

The Clerk said the county had at present in consols, received from county boroughs, a capital of 20,134*l.*, and an accumulation of interest amounting to 4,258*l.* They had also in consols the proceeds of the sale of the Gilesgate Militia Stores, 1,000*l.* He believed these sums totalled 25,392*l.*, and which was at present available to meet this expenditure without any charge on the ratepayers. Then they would save in rents for telephones, &c., another sum roughly estimated at 2,000*l.*, making together upwards of 27,000*l.*, as to which no charge would be made on the ratepayers.

For the amendment there were 34 votes and 24 in favour of the adoption of the report.

ROYAL DUBLIN SOCIETY.

AT a special meeting of the Council of the Royal Dublin Society the following report was submitted by the lecture theatre committee:—

The committee reviewed the correspondence with the Board of Works, from which it appeared that the Society had, in accordance with the agreement concluded with Sir John Gorst, lodged their contribution towards the cost of the theatre as far back as May 27, 1892, and that the general plans, after several conferences between the board and the committee, had been mutually approved in March 1893. The committee having learned from the Board that the work would probably begin on September 1, vacated the old theatre on that date, but tenders were not invited by the Board until December. When the committee learned the conditions under which tenders had been invited the following correspondence ensued:—

Royal Dublin Society: December 16, 1893.

Sir,—The Council of the Royal Dublin Society observe in the invitations to tender for the erection of the lecture theatre recently issued by the Commissioners it is stated that if the amount of any tender the Commissioners may entertain "exceeds 9,000*l.*, the excess must be reduced in the manner to be pointed out by the Board."

The Council had not contemplated that it would be proposed to so limit the expenditure, and they desire to reserve to themselves full liberty to object to any alteration which may tend to reduce the accommodation, structure or fittings shown on the plans, which have been approved after several meetings by the Commissioners and by the committee of this Council, and before any such reduction takes place they desire to have an opportunity for expressing their views upon the matter. The Council therefore desire me to ask that such tenders as the Commissioners may propose to entertain, together with the plans, specifications and bills of quantities for the work, shall be submitted to the Council for their consideration and observation at the earliest opportunity and before any decision is arrived at by the Commissioners.—I am, &c.,

RICHARD J. MOSS, Registrar.

The Secretary, Commissioners of Public Works.

Board of Works, Dublin: December 20, 1893.

Sir,—In reply to your letter of the 16th inst. I am directed by the Board to state for the information of the Council of the Royal Dublin Society that the figure of 9,000*l.* refers exclusively to the proposed expenditure on the structural portion of the new theatre as covered by the contract for which invitations have been issued, and has no bearing on other items of outlay

provided for in the estimate of 10,000*l.* originally laid before the Treasury.

It is not proposed to reduce in any respect the accommodation, structure or fittings agreed upon between the Royal Dublin Society and the Board, and the arrangements made on these matters will, it is needless to say, be strictly adhered to. If from any circumstances it should appear advisable to this Board to further consult with the Royal Dublin Society after receipt of the tenders, they will avail themselves of an early opportunity to do so.—I am, &c., P. J. TUOHY, Secretary.

The Registrar, Royal Dublin Society.

An interview then took place between the Commissioners and some members of the committee, and they were confidentially informed of the amount of the lowest tender which the Commissioners had received. The committee thereupon wrote to the Board and received a reply as follows:—

Royal Dublin Society: January 9, 1894.

Sir,—With reference to the recent interview which members of the lecture theatre committee had with your Board on the subject of the tenders for the theatre, I am requested to inform you that the matter has since received the very careful consideration of the committee. They attach the greatest importance to being placed in possession of full information as to the internal arrangements of the proposed building, and particularly those essential to the efficiency of a well-adapted lecture theatre and laboratory. I am to point out that some members of the committee have special knowledge on such matters.

With this object the committee wish to be informed whether the Board will be prepared when they have obtained a tender which they propose to submit for the approval of the Treasury, and before taking any action in reference thereto, or entering into a contract, to submit the plans and specifications with particulars of proposed alterations for the consideration of the committee.

The committee desire me to assure you that they are most unwilling to increase the difficulties of the Board in carrying out the work, but as the Society is contributing largely towards the cost of the work the committee feel that they are not unreasonable in asking for this information.—I am, &c.,

WALTER BOYD, Hon. Sec.

The Secretary, Commissioners of Public Works.

Board of Works, Dublin: January 12, 1894.

Sir,—In reply to your letter of the 9th instant relative to the plans, &c., for the erection of the lecture theatre, I am directed by the Commissioners of Public Works to assure your committee that, as already intimated to the Royal Dublin Society, they will abide by all guarantees previously given, and if there be any point in reference to which they think it desirable to consult the Society again before accepting a tender they will not fail to do so.—I am, &c., P. J. TUOHY, Secretary.

The Honorary Secretary, Royal Dublin Society.

It was then resolved:—

That the Council of the Royal Dublin Society view with great regret the course proposed to be pursued by the Commissioners of Public Works as shown by the correspondence now placed before them. The Council having contributed 5,000*l.* towards the erection of a suitable lecture theatre claim the fullest information regarding the plans and specifications upon which tenders were invited and the particulars of any deviation proposed therefrom with a view of reducing the cost; and protest against the withholding of information which would alone enable the Council to see that the arrangement under which they contributed the above sum was fairly carried out.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.

THE eleventh annual meeting of the Lancashire and Cheshire Antiquarian Society was held on January 26 in Chetham College, Manchester, Mr. J. Holme Nicholson presiding.

The Council, in their report, congratulated the members on the continued activity of the Society, as evinced both in solid archaeological work and in attendances at the summer excursions and winter meetings. The volume just issued would, it was hoped, be found worthy of its predecessors. The very full index to the ten volumes of the transactions of the Society, and the index of the papers published by the archaeological societies of the United Kingdom in 1891, had occasioned considerable delay in the publication, but had added great value to the volume. The Council offered their thanks to the feoffees of Chetham's College for the use of meeting-rooms, and to others who had been of service to the Society. The number of members continued to be very satisfactory. There were 275 ordinary members, 47 life members, and 6 honorary members, making a total of 328—a slight increase on the previous year. The name of Mrs. Linnaeus Banks,

who had done so much to popularise history of a local nature by her novels, had been added to the list of honorary members. Details were given of the various meetings held during the year. One result of the exhibition of corporate insignia at the *conversazione* given at the Manchester Town Hall, in December, was the formation of a committee to collect subscriptions with a view to the presentation to the Corporation of Manchester of a civic mace and, if funds permitted, other insignia. The archaeological survey of Lancashire had been completed during the year by Mr. W. Harrison, with the assistance of members and others resident in various parts of the county. This work was of the highest importance, and the cordial thanks of all antiquarians were due to Mr. Harrison. The Ecclesiastical Committee had held several meetings during the year. They had issued a circular to the rectors and vicars of the various parishes, and hoped shortly to publish a report detailing the results of their inquiries. There was a possibility that the congress of the British Archaeological Association might be held in Manchester during the ensuing summer. The Council expressed their obligations to Mr. C. W. Sutton, who for eight years had been editor of the transactions of the Society, and also to Mr. G. C. Yates, the honorary secretary.

The Duke of Devonshire was elected president of the Society, and the following gentlemen were elected vice-presidents:—Mr. J. Holme Nicholson, Sir William Cunliffe Brooks, Dr. H. Colley March, Professor Boyd-Dawkins, Mr. C. W. Sutton and Mr. W. E. A. Axon.

Mr. Thomas Letherbrow was elected treasurer and Mr. G. C. Yates hon. secretary.

Mr. Albert Nicholson called attention to the paragraph in the report with regard to the proposal to present a mace to the Manchester Corporation. At the *conversazione*, in December, at which corporate insignia were exhibited, it was stated that Manchester was almost alone among corporations, great or small, in having no mace and, in fact, no insignia of any kind with the exception of the mayoral chain. The opinion was then very generally expressed that this was a matter which ought immediately to be put right. The members of the Antiquarian Society, it seemed to him, were the right persons to take the initiative, and he had accordingly brought the matter before the Council of the Society. A committee had been appointed, who were now appealing for subscriptions, which would not be limited to members of the Society. It was proposed to get the very best man they could to design the mace. A mace was really a symbol of the delegation of royal authority, and was carried before the Lord Mayor. In the case of a visit from the Queen the mace would be carried by the Lord Mayor in front of Her Majesty. The committee were anxious to get the matter settled at once. A very important civic function was in prospect, and it was desirable that the Corporation should have the mace before that time.

CELTIC INTERLACED WORK

AT the meeting of the Kildare Archaeological Society, which was held last week at Naas, Mr. Thomas Cooke Trench read a paper on "Interlacing Ribbon-Work." He traced the mode in which the patterns were built up, which adorned not only the crosses and other works in stone in Ireland, but also the metal-work. In building the church of St. Michael's, in the adjoining parish, which was Irish from the foundation to the roof, he had sought everywhere for examples of this work; but he was much exercised, first, by the small number of suitable patterns available; and, secondly, by the thought why they should be confined to a servile reproduction of old patterns. Why should not they be able to produce patterns as well as these men of old? He had tried to produce what he thought beautiful patterns; but always just as he was bringing one to a finish some fatal crossing appeared, and the whole thing was a wreck. It was plain that there was some fundamental principle which, if one could only grasp it, would leave the rest easy. Suddenly it flashed upon him what the underlying principle must be. He tested it and found it to work. Since then he had made many drawings, not a few of which were reproduced in St. Michael's Church. He subsequently found that Mr. Romilly Allen had made the same discovery, and had communicated it in a paper read to the Society of Antiquaries of Scotland. An example of the work was shown, taken from the cross of Tuam, and perhaps the most perfect example extant of this especial kind of work. If they began at one corner and followed the ribbon throughout, they would find that, while it wandered in apparently the most aimless and reckless way about the surface, by the time they arrived back at the point from which they had started it had arranged itself into an intelligent and orderly pattern, devoid of repetition, but containing a general harmony throughout, one knot or twist balanced by a corresponding though totally different one, and all through the ribbons crossed one another

alternately, under and over, without a single break. In explaining the process he stated that the artist first covered the space to be dealt with with lines crossing one another, and woven in and out like basket-work. He then proceeded to join all the ends, two and two together, and finally he obliterated crossings here and there, joining the ends thereby set free in a manner different from that which they originally followed. Anyone could join the ends and obliterate the crossings, but the excellence of the pattern consisted in the skill with which these processes were carried out, and in that lay the art. Mr. Trench showed several other patterns of ribbon-work and explained the manner of their construction, but in speaking exclusively of the endless ribbon he did not wish it to be supposed that he gave it any undue preference over other and still more beautiful forms. He had merely sought to show how one very curious, beautiful and characteristic kind of decoration was produced, and to render simple and easy that which without explanation looked like an insoluble puzzle.

MUNICIPAL BUILDINGS, NEW YORK.

THE Advisory Board of Architects, consisting of Professor William R. Ware, N. Le Brun and Mr. E. H. Kendall, have presented a report to the Municipal Building Commission on the designs sent in for the new buildings. They say:—

We have the honour to report that the 134 sets of drawings submitted in competition for the municipal building have been examined by us, and those of them which seemed most commendable, whether in plan and arrangement or in external appearance, about thirty in number, have been carefully studied.

The six numbered 13, 23, 28, 35, 107 and 113 seem to us upon the whole the best, whether in respect of external appearance or of practical convenience.

But no one of them is perfectly satisfactory, and whichever design may be finally selected by the Commission, it will have to undergo considerable modification before it can meet their reasonable requirements.

Four of these exhibited steep roofs and follow in general the type of civic building of which the most notable example is the Hôtel de Ville, Paris. One of these has the whole upper storey in the roof, three have it partly in the roof; of the other two, one exhibits four full storeys above the basement, the roof being arranged flat. This design shows a high tower. Two of the six place the principal entrance nearly at the level of the ground; three set it up fifteen or twenty steps, with an equal number of steps on the inside to reach the level of the first storey, and one places it on the level of the first storey, which is reached by external flights of thirty steps.

In four of these designs the rooms and offices on the front and rear of the central mass of buildings are divided by a corridor 12 or 15 feet wide, which runs the whole length from east to west. In two of them the corridor is replaced by a central hall with narrow corridor and galleries on either side opening into it. In the remaining one is a similar arrangement in plan, but the wide central area is not roofed and forms a couple of internal courts for light and air.

In five of the designs the Governor's room is set in the middle of the front in the second storey; in the other, also in the middle of the second storey, but at the rear.

In two of these designs the council-chamber is set in the middle of the eastern front, upon Centre Street; in two, at the northern end of the eastern front; in one in the main front, but at the side of the centre, and in one also in the main building, but at the centre of its rear or northern face.

The main staircase, in three of the designs, is opposite the main entrance; in three there are two staircases placed symmetrically to the right and left of the central hall.

All the designs show a considerable extent of corridors lighted by borrowed light. In a building of this extent and elaborateness this can hardly be avoided, and though some of the drawings show more windows in the partitions than others, so that these corridors seem to be lighted, this is an unimportant distinction and not necessarily a ground of choice between them. Whatever means of lighting corridors is the best can be as well used in one design as in another.

Of more importance is the lighting of the rooms, and preference has been given to the plans in which the rooms are comparatively shallow. From this point of view it is better to have the corridors in the middle of the building or wing than along one wall, for, though not so well lighted itself, the rooms it divides are of a better shape.

It is not to be expected that any one of these designs, just as it stands, would be satisfactory from every point of view. The purpose of competition will have been answered if any one of them is found to be acceptable as a whole and is susceptible of such modifications as further study and conference with the city authorities will make entirely satisfactory. This is presumably the case with any one of the six designs herewith submitted.



Colour in Architecture.

SIR,—When, as of old, shall we see the glory and the charm of colour in our external architecture?

About a year ago a dozen leading men joined together in writing a book claiming modern architecture as an art, yet I believe that not a word was said about colour, perhaps for the very simple reason that nothing can be said of what has no existence; but I make bold to say that if this beautiful and never-wanting characteristic of ancient architecture could have been claimed by one or more of these eloquent writers as distinguishing the art of these days—well, the book need not have been written. Architecture with colour is, or may be, a fine art; without it, only a science, a practical art, a business or a profession.

The last half-century has witnessed the advanced education of our travellers and explorers as compared with those of the days of Stuart and Revett, who lived when purity or uniform whiteness was considered to be architectural beauty *par excellence*; but since then proofs have been published over and over again in the glowing works of Victor Place, Layard, Penrose, Pulgher, Texier, Stothard, Ongania and Mallay, that once upon a time, and for centuries of time, there was scarcely such a thing as architecture—external or internal—without rich colours. Harmony was secured and vulgarity avoided by the fearless use of at least two colours associated with black and white. People in those days would have been as surprised to see a monotone building of any more importance than a labourer's cottage as to see a leopard without his spots, a tiger without his stripes, the trees all grey, or that for some unaccountable reason the allwise Creator had changed "polychrome moths, humming-birds, gold-fish, roses and violets into one uniform tint." So essential was colour in the opinion of the Athenians that they treated the beautiful marble of Pentelicus in their temples very liberally with it. If, then, the above architects still find any difficulty in convincing the British public (as we suppose they have, or they would not have written the book) that they are artists first, and practical or professional men afterwards—that they really understand architecture as a fine art, that it is something more than a business—let them at once take vigorous measures, by establishing a society of painter-architects or otherwise, so that our thoroughfares shall, as soon as may be, display the ancient, necessary and lovely art of external polychromy. I am aware that men who never had a brush in their hands, or who by nature have no eye for colour, tell us that our dull and changeable climate is opposed to this idea. I venture to say—for the mere purpose of argument, for the sun and cloud effects of Britain are beloved of the artist—that paucity of sunshine is a reason not for the monotonous treatment of architectural façades, but for the boldest polychromatic effect, *e.g.* like that adopted in ancient times in the changeable and stormy regions of Auvergne and the Puy de Dôme, illustrated by M. Mallay; in Bavaria, where Charlemagne founded the abbey of Lorsch, with its external walls, as shown by Moeller, glowing with coloured mosaic; and in Munich, where colour is at this day a striking characteristic of modern external architecture. Besides, if the question of durability must be raised, have we not everlasting colours of all tints in the numerous porphyries, granites and serpentines of the United Kingdom, and means of working them in the most economical manner, which only want using with a student's knowledge and with artistic feeling, instead of in the present manner of a builder's apprentice of tender years? Indeed, science is daily revealing to us how wonderfully nature's works are invested and adorned with the loveliness of colour. It is everywhere. Take a ton of coal—of cannel coal. Pure and simple, it is not a beautiful object, but what lovely hues are latent within it. All tints of mauve and magenta were discovered by Perkin thirty-six years ago, and Roscoe has since extracted yellows, reds, blues, greens, violets, besides a number of browns and an infinity of blendings of all shades, with the result that a ton of coal thus chemically treated is worth 100*l.* sterling. As architects we may, if wise, take a hint from this, for perhaps our work, similarly converted from monotony to polychromy, might command improved terms equivalent to a fine art architecture. Certain it is that all architecture, worthy of the name, has its basis in nature; therefore it is undeniable that colour must form part of it, as we know it did in all ancient styles, and until it is again adopted as one of its characteristics, no less important than light and shadow, modern architecture will fail to rank as a fine art. But seeing what Englishmen do with the brush I do not despair of the event, which will be a golden wedding indeed. Then will the architectural room at the Academy become thronged instead of, as now, avoided; then will the nursing mother of all the arts take, as of right, her long

vacated seat—her cathedra—and be appreciated and beloved of the people for her own sake, instead of, as at present, parading in borrowed plumes and exciting contempt.

January 29, 1894.

HERMES.

GENERAL.

The French Commission on Theatres have decided that the directors of the Opera House, Paris, are to be allowed the use of a gallery in the Palais de l'Industrie, in which to prepare scenery to take the place of the canvases consumed in the Rue Richer.

A Prize of 1,000 marks will be henceforth offered annually by the Emperor of Germany to promote the study of ancient Greek art. The first subject will be a restoration of the head of one of the female figures from Pergamos.

The Recent Admissions to the Royal Academy Architectural School are Messrs. W. A. Brown, F. D. Clapham, S. E. Cook, A. R. Hamilton, W. Hawke, J. Kirkland, W. Mackinnon, E. J. Richmond.

An Estimate has been prepared for the construction of a new chamber for the French deputies, which amounts to 4,500,000 francs. The existing *salle* will be used for conferences.

Herr Robert Koldewey, architect, of Hamburg, has been nominated as doctor in philosophy by the University of Freiburg, in recognition of his inquiries into the history of Greek and Oriental architecture.

M. Pierre Cavelier, the sculptor, and for many years professor in the Ecole des Beaux-Arts, has died in Paris in his eightieth year. He was a pupil of David d'Angers, and in turn taught several of the principal French sculptors.

The Restoration of Swansea Church is to be undertaken at a cost of 25,000*l.* from plans by Sir A. W. Blomfield & Son.

The Guardians of the Walsall Union are not likely to appoint a professional assessor in the competition for the infirmary buildings.

The Painting known as *Le Roi s'amuse*, which was a too characteristic work of the late Jules Garnier, has been accidentally torn in shreds while being stored in St. Louis.

The Premiated Designs for the Rossville Asylum, New South Wales, have been despatched to Mr. C. H. Howell, in London, for report. The local judges were the Government architect, the president of the Colonial Society of Architects and a medical doctor.

An Exhibition of Japanese lacquer and metal-work will be open at the Burlington Fine Arts Club until March 31.

The Fourteenth Exhibition of Paintings in Toynbee Hall, Whitechapel, will be held during the three weeks of the Easter holidays. Pictures will be received up to March 16.

Gray's Inn Chapel was reopened on last Sunday after restoration, which was carried out under the direction of Mr. C. H. Shoppee.

Mr. T. Taylor Scott has prepared plans for the improvement of Fisher Street Presbyterian Church, Carlisle, which have been adopted.

Mr. Gourlay Steell, R.S.A., the animal painter, died on Wednesday. He was a brother of Sir John Steell, the sculptor.

Mr. J. C. Brooks has presented to the Newcastle Society of Antiquaries his collection of portraits and autograph letters in twenty cases. They include portraits and autographs of sovereigns from Henry VII. to Victoria (excepting Mary and Edward VI.), most of the Anglican archbishops and bishops, of Sir Godfrey Kneller, Hogarth, Pope and Wellington, the presidents of the United States, including Washington, &c.

A New Ward is to be added to the Halifax Infirmary at the cost of the Rawson family, at an outlay of about 5,000*l.*

Mr. C. Lonsdale read a paper on "Some Trees and Their Uses" at the last meeting of the Carlisle Architectural, Engineering and Surveying Association.

Josef Israels, the Dutch painter, has received from the Queen Regent the Order of Orange-Nassau, on occasion of his seventieth birthday on the 27th ult.

The Ancient Curfew Tower at Barking is now falling into decay, and it is proposed to restore it.

The Annual Report of the Liverpool Art Club has been issued, showing a membership of 213, improved financial circumstances, and stating that the work done has been most satisfactory.

Mr. Basil Champneys will read a paper on "The Relation of the Ideal to the Practical in Architecture," at the meeting of the Liverpool Architectural Society on Monday, the 5th inst.

Mr. W. Henman presided at the meeting of the Midland Arts Club, Birmingham, on Tuesday. The election of officers for 1894 resulted in the appointment of Major C. J. Hart, president; Messrs. W. J. Wainwright, A.R.W.S., W. J. Morgan and W. Doubleday, vice-presidents; Mr. F. H. Stead, treasurer; Mr. W. H. Vernon, hon. sec.; and Mr. H. Cheadle, hon. curator.

The Architect.

THE WEEK.

AMONG the recent purchases of the London School Board is the Old Palace site in St. Leonards Street, Bromley-by-Bow, for the erection of a new school. The Works Committee are informed that the building which was on this site was formerly an Elizabethan mansion of ancient structure, and contained among other interesting relics a fine carved oak chimneypiece, standing the whole height of the room. The old materials of the building, which would under ordinary circumstances have realised only a small sum, were sold in this instance for the sum of 256*l.* A letter has been received from the Society for the Protection of Ancient Buildings, drawing special attention to the great historic interest attaching to various parts of the building. The chimneypiece referred to above is now in the possession of Mr. BINNS, of Brompton Road, who has given the architect of the Board the refusal of it for 150*l.* The committee are of opinion that this chimneypiece should be repurchased, and should be placed in one of the halls of the new school to be erected on the site, thus carrying out the principle contained in the following resolution, which was passed by the Works Committee on March 14, 1892:—"That it be an instruction to the architect, in planning schools upon sites having historic interest, to insert a tablet recording the circumstances connected with the site in some convenient situation, the wording of the proposed tablet to be submitted to the Works Committee for their approval."

THE Bolton Town Council on Wednesday approved of a wise resolution of the Streets Committee. It appears that some 'cute architect contrived to gain access to the plans which had been deposited with the Corporation. He made a copy of one which was employed as evidence in a lawsuit against the people for whom it had been prepared. It was denied by all the officials that permission was given to make a copy. There was a suggestion given that under the circumstances the copying was a criminal act, and every honest architect will regret that some steps were not taken to expose if not punish the guilty party. The Town Clerk considered the copying was only a breach of faith. The Streets Committee decided, and their resolution was endorsed by the Council, that henceforth plans must not be inspected without the consent of a proper authority. We hope the officials elsewhere will adopt a similar precaution.

BUILDING exchanges have become an indispensable institution in the United States, and Mr. R. J. BENNETT could not therefore have selected a more apposite subject for the paper he read before the architectural section of the Philosophical Society of Glasgow on Monday. He said that these exchanges had been founded in the belief that more intimate social relations would tend to check the bitterness of rivalry and keep the eagerness of competition within reasonable limits, while at the same time enabling the members to gain knowledge from the experience of others. The exchange at Philadelphia was selected as representative of those which were found in the principal American cities, and was described at length. The corporation of the exchange was composed of employers in trades that have to do with the construction and finishing of buildings; and the exchange was also intended for the use of architects, surveyors and dealers in all necessary materials. In Glasgow, Mr. BENNETT said, they had long felt the need of such an exchange, owing to the difficulties that often arose when one employer wanted to see another as to the work in which they were both engaged. Such an institution would raise the status of the various trades connected with it, and though it might take a year or two to get into working order, he believed that it would soon prove of immense advantage. He stated that in America the architect completed his plans of the building to be erected, the surveyor or measurer took off the quantities, and then the plans and specifications were sent to the secretary of the exchange with names of builders selected, if more than one was invited, to contract. That in-

formation was imparted to all the contractors. As architects there as well as in this country had a habit of altering the plans during construction, the secretary took the precaution to photograph them. The offers were opened by the architect in presence of the offerers, and the lowest, being found to be correctly figured, he generally got the job, provided he was a member of the exchange. Another benefit that the exchange conferred was that payments were made at regular intervals, fixed at the time when the contracts were entered into, and that the measurer was kept up to the mark and not allowed to lag behind. The architect also was protected, for if he ever found out that the specifications were not being complied with, he had only to inform the secretary of the exchange and the matter was at once investigated by the directors and put right. It would thus be seen that the exchange would soon put an end to shoddy work and shoddy-work prices, and the public would have more confidence in the tradesmen they employed, while a better feeling would be established between architects, surveyors and tradesmen.

BUILDERS, and especially contractors for painting, would appear to have broken an Act of Parliament with immunity for over forty years. This strange fact was discovered by Dr. THOMAS, the coroner for the Paddington district. At an inquest held on the 2nd inst. upon the body of a labourer who fell from a window-sill while engaged in removing a ladder, the coroner pointed out that ordering a man to stand on a window-sill was illegal. Section 28 of 10 and 11 Vict., c. 89, enacted that "every occupier of any house or other building, or other person who orders or permits any person in his service to stand on the sill of any window, or upon any house or building within the said limits, is liable, unless the window be in the sunk or basement storey, to a penalty not exceeding 40*s.*, or, in the discretion of the justices before whom he is convicted, to be committed to prison for a period not exceeding fourteen days, and any constable by virtue of this Act shall take into custody without warrant, and forthwith bring before a justice any person who within his view commits any such offence." The coroner could not decide whether the Act applied to all England, to London alone, or to the provinces, but there was no doubt that the prohibition was on the statute-book. The builder who had employed the man said he could not understand how work was to be done under such conditions, and as the Act has been allowed to fall into desuetude, it would appear as if the authorities were also of that opinion.

SOME explanation of the connection between the place-names of the Angles and dwellings was given a few evenings ago by the Rev. H. KINGSFORD in Worcester. The termination "ton" or "tun" was frequently found. The "ton" was first a single dwelling, a farmhouse it might be, and such was the meaning of the word still in the north. When the Angles dispossessed the Romano-British occupants of the country, each man had first to build himself a rough shanty or dwelling. He had to secure himself against wild animals and against the men he had dispossessed. To do that he threw up a mound round his house, and where the earth for the mound came from there would be a ditch or dyke, on which stakes would be placed. From the points or "tines" of his stockade or brushwood hedge came, some said, the name "ton" or "tun"—a place protected by "tines." Perhaps it was called after his own name or some name in the old country, or by a name describing the natural features of the place, or its relative position to some other "ton." Then he would want a secure place for his crops. He would make another "ton," the "bere-ton," or the "bar-ton." Further, he would want a place to tend his cattle—a home-pasture. So he made a "tining"—an enclosed "ing" or meadow. The Angles must have been, judging from their place-names, an unimaginative if aggressive race. They were not unlike the stolid Dutch and German settlers at the Cape and in the Transvaal. There was little variety in their place-names. Over and over again they found Northtown (Norton), Southtown (Sutton), Easttown (Easton or Aston), Westtown (Weston), though one or other of these names in a particular district or tithing might have passed away with the thing itself.

RISKS IN QUARRYING.

AS geology is the healthiest of all scientific pursuits, it is allowable to conclude that workmen who are engaged in quarrying do not labour under as many insubstantial conditions as the men employed in the majority of trades. It is found by a comparison of statistics that the death-rate of slate and stone quarrymen "is precisely the same as that of the medical man, and is lower than that of cabmen, bargemen, carters, law-clerks, butchers, hairdressers, bookbinders, plumbers, glassmakers and others." At the present time there is, however, a belief that by some exertion of authority every calling could be cleared from inconvenience, and the quarrymen may be excused if they demand arrangements which would enable them to live longer than medical men. FREDERICK THE GREAT could not understand why his youngest soldiers should have any fear about coming close to the enemy, for their hesitation indicated a desire to live for ever, which he considered to be unphilosophical. In our time, on the contrary, the unfittest have an ambition to survive as long as the fittest. The quarrymen, who are very useful members of society, were only acting like their fellow citizens when they clamoured for an official inquiry into the "conditions under which the quarrying of stone, limestone, slate and clay is conducted, with the object of diminishing any proved dangers to the life and health of the workpeople engaged therein."

The said workpeople are sufficiently numerous to possess a voting power that is not to be despised. According to the census returns they numbered in England and Wales 102,369 in 1881, and 105,796 in 1891. The increase is insignificant, but we may be allowed to remark that it indicates one of the mysteries which are always found in statistics. It might be supposed that as in the decade in question brick buildings and terra-cotta ornamentation were in unusual favour, there would be a large increase in the number of "clay works, including brickmakers." It so happens that, on the contrary, the number of workers under that head has decreased from 54,919 to 49,584, while the stone quarriers have increased from 28,870 to 36,813. More curious still is the fact that the plaster and cement workers, in spite of the decline in the adoption of cement fronts for houses, have increased from 3,680 to 5,636.

The Quarry Committee, having visited a great many districts, believe they have gained a general idea of the conditions under which quarrying is being carried on at the present time. They have, therefore, lost no time before drawing up a code of special rules, which are designed to prevent accidents and to mitigate their effects. We have as strong a desire as any of the professional philanthropists to see risks to life or health diminished in all trades, but everybody who has had acquaintance with quarrying will have no hesitation in saying that in this country at least the dangers arise from the carelessness of the men, and as long as that exists (or while the human race remains as it is), remedial measures can be no more effective than those which might be proposed for the benefit of boys and babies. Familiarity breeds contempt, and in no place is the proverb more strongly exemplified than in an ordinary quarry. The men have become so accustomed to overcoming the cohesion of rocks, they only realise the possibility of death or maiming as a remote contingency. In mines the case is different. There the danger arises from an invisible enemy, and by taking precautions, which can be insisted on by managers and overseers, it can fortunately be minimised. The quarryman has no fear of firedamp; his enemy is colossal, but palpable, and the flaws and other weak points in it only make him despise it. If there is anything to be feared in quarrying operations it might be supposed to be blasting; but there is a class of men—and, we imagine, hardly a quarry is without representatives of them—who are so foolhardy in dealing with powder as to appear irrational. They cannot be convinced that the force in powder may be latent. If it will not "go off" they imagine it can be tamped with impunity, and it does not always happen that they are made cautious by an accident.

The evidence relating to Welsh quarries which has been selected to accompany the report of the Quarry Committee will, to the initiated, confirm what we have said, although many tender-hearted people who are not acquainted with

the way in which stone is obtained may imagine that the witnesses have spoken about a sort of daily martyrdom. The truth is, that until recently the quarryman was far more happy and contented than any of the workmen in towns. He has been operated on by agitators, and he has come to the conclusion that he must have grievances. What they are is not clear to him, but at least his pride will be satisfied if the Government will interfere. An extract from the evidence of one of the quarrymen will suggest the indefinite character of what is sought:—

Are you satisfied that everything that can be done to prevent accidents is done, or is there anything you can suggest?—We want more care and more authority to command obedience to the rules. We also want experienced men, as the quality of the rocks differs so much.

Are your officials experienced men?—Yes, they are practical men.

Then what do you mean by saying that you want experienced men?—The great drawback is that the most experienced men do not take any notice of any man's bargain but their own.

But you said you wanted experienced men, and you say that the officials are experienced; what more do you want?—We want one to look after them all.

Do you mean a Government inspector?—I think that would be the right thing, if sufficient authority were vested in him to compel obedience to the rules.

It might be supposed that the men would realise that most (accidents when not arising from their own carelessness) are due to causes which cannot be foreseen. Rocks are subject to actions which take place within the beds, and cannot always be safeguarded or prevented by the closest examination of the exterior. If a Government inspector were stationed in every quarry, however small, he could not always anticipate the slipping of stone any more than he could prevent one man from allowing a stone to fall on his neighbour. Yet a man who has been working for forty-five years, thirty-two in one quarry, like many of his fellows, considers, although he has gone scathless, that the only chance for safety is by placing all the quarries under Government officers. In his evidence he states:—

You say you want the quarries under Government control?—Yes.

What reason have you for that?—Because there is not sufficient supervision. We do not approve of the method of working the quarry.

Who are the persons who do not approve of the mode of working the quarry?—We as workmen.

And do you suppose that a Government official would show you a better way of working than the owners and the men themselves?—I do not know that. It is an old method, and rather difficult to improve upon.

Do you mean to say you do not approve of the mode of working, and yet you say it is difficult to improve upon?—There is a better method, but I do not know what the expense of adopting it would be.

You propose that the quarry should be worked under Government management?—Yes.

Do you believe the Government management would find those ways out better than the owners themselves?—If they gathered all the rubbish from one sink to a certain place, to a kind of incline, it would be better.

Instead of the system now in force?—Yes.

You say that no one examines the places to see if they are dangerous?—No, not regularly.

In comparing Government inspection with the inspection of the workman and employer, you say the employer's official goes round once a day, and that the workman is there every day; which inspection is best, the inspection of the workman who is constantly there, and the official who visits the place once a day, or the Government inspector who would come periodically?—I do not know what work the official would do. The workman goes to his work in the morning, and works until late, and has no time to look about him.

The Government must be flattered by such confidence in officialdom. But ordinary people, who have to pay for such control, would hardly care to hand over their business to the civil or military experts of the Science and Art Department, that would probably monopolise the quarries like other things. If men were being constantly maimed through the indifference or the niggardliness of quarry owners, there might be reason for the Government to interfere. But, according to their own account, accidents rarely occur. One witness said his finger was once slightly cut, but however we may sympathise with such catastrophes, it is hardly necessary to revolutionise business in order to obviate them.

It may be granted that more safety would be insured if the men could be persuaded or forced to be less foolhardy. The manager of a slate company pointed out one way of meeting the case when he said, "It appears to me that what is wanted is a rule binding the men to take necessary precaution, and empowering the employer to prosecute any workman found disregarding it, as a collier is prosecuted for

wilfully taking matches into a mine." He also remarked that "if a rule is passed which puts any liability upon the employer for the wilful act of the men, it would work great injustice." It would be necessary to increase largely the number of stipendiary magistrates if every neglect of a rule were to be followed by a prosecution. The men are too much accustomed to their own ways to tolerate a rigorous control of that kind.

It will be said that the death-rate among quarrymen is about 12 per cent. higher than the mortality of "all males" in this country, and that circumstance is proof of the existence of evils which are probably remediable. Again, quarrymen are much above the average in mortality from phthisis and diseases of the respiratory organs, being nearly three times in excess of fishermen. The numbers are 198 for fishermen, 337 for carpenters and joiners, 453 for builders, masons and bricklayers, 462 for wool-workers, 543 for cotton-spinners, with 582 for quarrymen. The cause to which the abnormal mortality is ascribed is the inhalation of stone dust, which operates to a more terrible extent among potters, for their death-rate from lung diseases ascends to 1,118. There is a worse figure for the Cornish miners, viz. 1,148. The Sheffield trades are commonly supposed to have an unenviable position in statistics of that sort, but as for knife and scissor-making the number is 760, and for file-making 783, it is evident that quarrying is worse. It must be also acknowledged that alcoholism, liver diseases, nervous diseases, &c., are not prevalent among them, and according to Dr. OGLE, the late superintendent of statistics, "the mortality figures tend to show that the quarrymen are a set of strong men, who live a healthy life, with the exception of the inhalation of dust and the liability to accident."

If the conclusion be correct it is much to be regretted; but it is hard to see how Government officers could prevent the inhalation of minute particles of stone or compel them from operating injuriously on the respiratory organs. The use of respirators or the practice of breathing through the nose might diminish the evil, and quarrymen could make the experiment without compulsion. Science may some day discover some other means of preserving men against the consequences of following dangerous trades, but unless we go back to the savage or golden age we must put up with them. Every application of materials in manufactures brings misery with it. No committee can devise means of neutralising an evil which is inseparable from quarrying. If the high death-rate were due to accidents there would be some reason for interference.

It does not follow that the evil is to be allowed to grow. Something can be done, but it must be by the quarrymen themselves. Their indifference to consequences is not confined to the quarries. When we find a doctor saying he has had more cases which could be attributed to exposure at funerals than to working at the quarries, it becomes plain that the men care little about the effects of the weather. They will not take the trouble to change wet clothes, and they sometimes sleep in them. One of the doctors said that where the men were provided with oil suits they would not use them. The houses of the quarrymen, especially in Wales, are guarded against the admission of air. The food is also of a kind which does not promote vigour, but predisposes towards disease. In no part of England is instruction in the conditions of health more needed, and until it is imparted a high death-rate will prevail in the slate district.

The Committee in their wisdom have recommended that refectories should be provided and places for drying clothes, that the hospital accommodation should be increased, that instruction should be given in ambulance work and to the wives and daughters in nursing and cookery, also that means of recreation should be facilitated. All the proposals may have their advantage, but they will convince the men that the quarry-owners have been neglecting their duties to their employés.

More remarkable are the proposed precautions to insure the safety of the men. Accidents are rare, and in nearly every case they are caused by a neglect of established rules on the part of the employed. The Committee, however, recommend clearance of loose ground or material, additional width in "galleries," wide and clear spaces on both sides of tramways, and the introduction of fencing wherever

there is room for it. In blasting wooden rammers are to be substituted for steel. An efficient system of signals is to be established, to notify when blasting is about to commence and when it is completed. We agree with the proposals that "after firing a charge of any explosive, no further charge is to be introduced into the hole, or into any rent, until after the lapse of twenty minutes," and that "if a shot has apparently missed fire, no person shall be allowed to go near until after the lapse of half an hour." But as the responsibility is cast upon the owners alone, we cannot see how in large quarries the arrangement will work. It would be necessary to have an overseer watching every hole, and the keeping men idle for an indefinite time during every day. The advantages would be infinitesimal. If operations in quarries were carried out by little girls, it would be prudent to watch over them; but as with men there are few risks, we can only consider the recommendations as exemplifying Lord MELBOURNE's apprehensions about the danger of a policy which insisted on "something being done" at any cost.

CONSTANT TROYON.*

IF slanderous and baseless accusations (like those of CHARLES KINGSLEY) had compelled CONSTANT TROYON to write a sort of autobiography, it would bear a resemblance in one way to the "Apologia pro Vita Sua." The Oxford divine seemed to take pleasure in convincing himself that he owed his powers to the influence of other men, most of whom were intellectually his inferiors. One taught him, he says, to weigh his words and to be cautious in statements; another was supposed to open his mind to teach him to think and use his reason. From others he perceived the importance of certain doctrines and practices. If a friend were sympathetic and left him to himself, that also produced a developing effect. TROYON was no less modest and was always willing to ascribe his skill as derived from the suggestions of his friends, or if they were disposed to take the credit for his success, he raised no objection. He went so far as to believe that he acquired more from his pupils than he had taught them. To CAMILLE ROQUEPLAN he was held to be indebted for the principle that the *ensemble* of a picture must not be forgotten when working out details. THEODORE ROUSSEAU likewise operated on him. PAUL HÛET's description of TURNER's and CONSTABLE's experiments was also believed to aid in the growth of his genius. M. CHARROPIN has recorded that, if it were not for the incessant war he waged with him, TROYON would never have introduced cattle in his landscapes. If all the legends are true, there never was a painter who underwent so many transformations as CONSTANT TROYON.

The explanation is that TROYON was a great genius who was not endowed with self-confidence. He was a silent man, especially about the various theories which arose in his mind. He was able to realise many ways of expressing what he thought about nature, but how was one of them to gain preference? A far less gifted artist, with one or two very clear notions about what he ought to do, could easily arrive at a decision, and by continual repetition he would convince people that his limitation was a style. TROYON had, so to speak, the gift of tongues, and as he was never sure which was the most suitable on an occasion, he was glad to have the advice of his friends. There is a chapter in M. SALMON's "Souvenirs d'un Sculpteur" (which we lately reviewed) which gives a revelation of TROYON's peculiarities. At the time in question he was in the lowest spirits, as he well might be, for a dealer had refused to give him a hundred francs for a painting, and another would not accept one in exchange for a canvas. As TROYON had then passed his fortieth year, he concluded that he had been on a wrong path throughout his life, and his only chance was to begin again. He proposed to serve as a pupil with DUPRÉ if his friend would accept him. DUPRÉ humoured the hypochondriac. He ordered TROYON to prepare his palette, and it soon assumed the appearance of a circle of precious stones. DUPRÉ scraped off one brilliant spot after another until no more than the colours

* *Constant Troyon.* Par A. Hustin. Ouvrage accompagné de 42 gravures. Paris : G. Pierson et Cie.

of the spectrum, with some ivory black and bistre, were visible. DUPRÉ ordered him to paint with the revised palette, but if he had insisted on monochrome painting, TROYON would have complied. In the next exhibition the artist's new manner was supposed to be perfection; amateurs and dealers contested for his pictures, and TROYON's earlier works, which were scorned year after year, were accepted without misgiving. M. CHARLES BLANC gives another version of the origin of the sudden success of the artist. In 1849 LOUIS NAPOLEON, whose *coup d'état* was like MACBETH's in being "fantastic," visited the Salon. M. BLANC, who was deputed to attend him, took some trouble to point out the merits of TROYON's pictures, but without convincing the President. However, when the name of the artist a few days afterwards was returned among those which ought to figure on the roll of the Legion of Honour, LOUIS NAPOLEON good-humouredly concluded that his want of ability to appreciate TROYON's works must arise from some deficiency, and the ribbon was awarded to the artist. Whether the cause of the unexpected success was due to the operation of DUPRÉ's palette knife or to the praise expressed by CHARLES BLANC, the conclusion must be drawn that French dealers and amateurs are as whimsical as those of other lands, and that a painter's merits are as likely to be overlooked in Paris as in London.

If continuous labour merited reward, TROYON was entitled to it. Few of his contemporaries could present such a record of toil amidst neglect. He was born in 1810 at Sèvres, where his father and mother were employed in the royal pottery. The family was very poor, and in the course of a few years the mother was left a widow. Young TROYON grew up amidst works of art, and in his childhood he began the studies that were requisite to prepare him to take his father's place among the pottery decorators. He was a diligent student, but from the first he appears to have felt doubts about the claim of any style to be an adequate revelation of nature. The country around Sèvres is still beautiful, and in those days it was less of a Parisian suburb. In the mornings young TROYON endeavoured to represent bits of it, but he found he was hampered by his decorative studies. The legendary herald painter, who was enraged by the difference between his own lions and those he beheld for the first time in the Tower of London, satisfied himself by concluding that nature was in error. TROYON was less confident about the superiority of the flowers, trees and landscapes which he prepared to adorn pottery. He received some instructions from a landscapist, but he was no more able to reconcile the style that was then in favour with nature than his own decorative work. With all his doubts about the best way of rendering scenery, three of his views about Sèvres were accepted as suitable for the Salon of 1833.

TROYON painted a good many nooks and corners of the same district in succeeding years. Then he went further afield and became acquainted with landscape of a wilder sort. His pictures were duly hung, but when in 1841 he is found to have sent in a *Tobit and the Angel*, made up of conventional rocks, trees and streams, quite in the Italian style, it becomes evident that TROYON was nervous about putting on canvas what he saw, and that Academic rules kept him in thrall. Fortunately for him, he was welcomed among the artists who were in revolt against old world recipes, and who had made the forest of Fontainebleau a place of inspiration as well as a refuge. By 1844 his contributions to the Salon had become less artificial. But he was not entirely free from fear about the dangers of innovation. He could paint animals with at least as much power as was to be seen in his trees, and his friends wondered why he did not make a combination of the two elements. That was his own desire, but the respected lawgivers of art had laid down that a picture must lend itself to classification or catalogue making, and therefore should above all things have a definite determination or unity. Did not CLAUDE profess to paint only landscapes and to give away his figures as if they had no part in the pictures? Did not NICOLAS POUSSIN paint figure-pieces alone, for although he carried home pieces of rocks and trees and was most careful with his backgrounds, they could be no more than fortuitous landscapes? Why should a man who had a mother to support and other burthens, and who was not a favourite with the public, jeopardise himself by producing pictures of

so uncertain a character that some experts would call them landscapes while others would say they were "animaux"? TROYON was undecided, and to escape from apprehensions and temptations went to Holland, in order to discover if the Dutchmen, who loved animals as well as fields, had found any way of combining them without sacrifice of their qualities. He returned with the conviction that it was best to follow nature, and if he found himself delighted with country scenes to which additional animation was imparted by animals, why should not a record of it please other men?

The public were pleased by the innovation, and were indifferent to the difficulties which were imposed on the classifiers. The general belief was expressed by EDMOND ABOUT when he wrote:—"The most admirable of all our landscapists is a painter of animals. His manner is large, his ideas simple, a profound sentiment of nature animates all his works. His is a colour that we know, for we have seen it in the country." Fortune came to the artist with both hands full, as if to make compensation for long years of poverty. "I am told," said ABOUT, "that M. TROYON has in the course of the year sold pictures to the amount of a hundred thousand francs. Was it too large a sum to receive? Certainly not." It may appear nowadays that 4,000*l.* is too insignificant a sum to enable a man to be considered as a popular painter, but it must be remembered that ABOUT was writing of a time that is forty years back, and of Paris. For ten years TROYON's talent appeared to be growing. In 1859 two of his pictures, the *Departure for the Market* and the *Return to the Farm*, a morning scene and an evening, revealed his genius at its best. Afterwards there was a gradual decline in his handling, and towards the close of his life his vision seems to have become distorted, although he was unconscious of any change. He died in 1865.

TROYON appeared to have always before his mind's eye "les délices de la campagne." His pictures might be evidence that France was the loveliest and most fertile of pastoral countries. His trees are luxuriant, his cows and sheep well fed, his peasants happy. If compared with MILLET, he must be considered as over imaginative, if not an idealist. TROYON had to suffer in his best years from that hope deferred which maketh the heart sick, and we may even suppose that his disappointments strained his brain, but he avoided expressing his sorrow on canvas. His pictures suggest a man who could only see the sunny side of things, and was too happy to think about the misery that was visible near every field. TROYON possessed that joyousness of spirit, when in contact with nature out of doors, which is supposed to have been the especial prerogative of primitive times. His extraordinary skill in chiaroscuro never seems to have induced him to treat sombre subjects; he employed it mainly to increase the brilliancy of sunshine. Indeed, his natural gifts for the expression of phenomena were so strong, his best works do not seem to be laboured. TROYON judiciously kept within bounds where he could revel in nature as a faun.

It is not easy to write a biography of so quiet a man, who may be said to have had only one way of uttering his thoughts. TROYON was not talkative and he detested writing. He avoided adventures, and none arose in his journeys from his studio in Paris to his mother's house in Sèvres, or the district where he had decided to set up his easel. M. HUSTIN perceived that TROYON, even in his biography, should not be severed from painting, and he accordingly describes the artist at work, his processes and the results. A very elaborate account is given of the sales of TROYON's pictures and drawings, and there are faithful reproductions of the paintings or of masterly etchings from them.

EXCAVATIONS IN EGYPT.

DURING this winter two pieces of archaeological work are being carried on in Egypt under English direction. At Deir el Bahri, near Thebes, says a correspondent of the *Manchester Guardian*, M. Naville, on behalf of the Egypt Exploration Fund, is uncovering the great temple of Queen Hatshepsu; while at Coptos, thirty miles further north, excavations in which Manchester is specially interested have been begun by Professor Flinders Petrie. Coptos—or, as it is now written, Kofo—was from the earliest times a commercial city of great importance. Situated as it is at the end of the great

trade route across the Eastern desert to the quarries of Hamamat and to the Red Sea, it must have been the starting-point of all the many expeditions sent to bring great stones from Hamamat, and those which marched across to Kossair, there to make their ships for the voyage to Punt. It is mentioned in an inscription so early as the sixth dynasty. It is known to have contained a large foreign population and its prosperity lasted until the time of Diocletian, when it revolted and was besieged and destroyed. Of its later history little is known; Keneh became the terminus of the Red Sea trade. Now "the holy city of Kebtu" has become the Arab Koft, a miserable town ignored even by the postal steamer; in the modern town there is nothing of interest. The ruins lie to the south-east. Here, over a space half a mile in each direction, the ground is covered with crumbling walls of unbaked brick; some are thin, others 15 feet thick and 30 feet in height. Between them the ground is covered with a thick layer of broken pottery of late Roman date, which crackles continually under one's feet. This strange accumulation is due to the labours of the Sebakhin, who are rapidly denuding most ancient sites in the country. They take the soil from the ruins, which has been found to possess some value as a manure, pass it through a sieve and carry it away in sacks to scatter it over the soil. It is with the fragments of pottery thrown from the sieve that the whole area of the city is now covered. The rate at which the ancient ruins are being removed is very rapid. In Koft most of the Roman wall which surrounded the town has disappeared, and the whole level has been lowered 30 feet. So the process will go on until the ground is lowered to water level, when palms will be planted and cultivation will spread over the whole site and nothing will be left of Coptos but a few pieces of sculpture scattered among the museums of Europe.

But as yet there is something which has still the appearance of a town; the streets are cumbered with heaps of fallen bricks, and only the stoutest of the house walls are left, but the main lines of building are clear; the city wall can still be traced, and in the centre of the town the temple area forms a clear space on which private buildings have never been raised. It is in this temple area that work has been begun; no building is left above ground, and the temple for whose remnants search is made is known to have been a recent one. But there is always the hope of finding reworked stones—stones perhaps of the temple of the sixth or the eleventh dynasty, utilised by later builders in foundations or in pavements. This hope has already been brilliantly realised. Half of a stela has been found representing the wife and daughter of Rameses VI. Of this king, one of the sons of Rameses III., very little is known, and this monument is valuable as giving the name of his wife, "Gold and Lapis Lazuli." Another stela, removed at some unknown period from the cemetery and worked into the temple pavement, is of the eleventh dynasty, and, like the famous Antef stela, not only represents the deceased person and his wife, but their dog is seated under their chair, and its name is given. This prominence of dogs is characteristic of the eleventh dynasty, the great period of sport in Egypt. Professor Petrie suggests, with great probability, that this taste for hunting arose in the times of the princes of the ninth and tenth dynasties, who ruled, not over the whole country, but over little strips, perhaps twenty miles long, of the Nile Valley. The cares of government could not absorb their whole time, foreign war was impossible for them, and they would naturally turn their attention to antelope-hunting and the desert.

In the bed of clean sand on which the temple of Coptos was built Professor Petrie has just discovered parts of a primitive statue of the very greatest interest. They consist of the head and legs of an idol of Khem, the local god of Coptos, which must be attributed to a period long before the oldest art hitherto known in Egypt. The head is a rounded block, with roughly-hewn ears and a beard, but no face; the legs consist of a pillar 6 feet long, with the division between the legs indicated by a deep groove; the knees are shown roughly, but the feet are missing. The side of one leg is covered with sculptures in low relief, which are quite as nearly related to the rock carvings as to the tomb sculptures of the fourth dynasty. There is the unexplained symbol of Khem—the dish with a double barb at each side; there are two large seashells; there is a cow and a hyæna upon the mountains, and an elephant. This elephant alone shows that the sculptures are of a very early period; it is not known in Egypt in historic times, and only occurs in the hieroglyphs in the name of Assuan, Abu, afterwards Elephantine. No sign of its presence so far north as Coptos has been hitherto observed. This statue, we may safely conclude, was the primeval idol of Khem, perhaps originally a natural block with some rough resemblance to a man. Under one of the great kings, perhaps Khufu, it was doubtless replaced by a more satisfactory work of art, and lay in the temple area neglected until the builders of some later temple buried it in the sand bed in which it has now been found. The whole statue must have stood 15 feet high, and must have needed some prop to sustain it. This will explain the band shown in all the representations of Khem, attached to his head and

falling to the ground behind. The black face characteristic of the god may also be explained if we suppose that this idol had an ebony face attached to the flat stone surface now seen. The body of the statue will probably be found as more of the sand is cleared. Then we may restore in its completeness the oldest work of art in Egypt, an idol that was of unknown, untold age when Sueseru died and the new King Khufu began to build the Great Pyramid.

SURVEYORS' INSTITUTION.

THE following candidates who presented themselves at the preliminary examination of the Surveyors' Institution, held concurrently in London and Manchester on the 24th and 25th ult., have satisfied the examiners:—Adams, Ernest Victor; Addiscott, Henry Hugh; Arno, Samuel; Baines, John Cecil; Banks, Herbert Richard; Bickford, Joseph Grant; Bradwell, Gervase Hulbert; Chadwick, Spencer Dyson; Colbourne, Robert Bertram; Cox, Walter Theodore; Daniel, Henry Wilkinson; Drew, Walter Hubert; Driffeld, Thomas Henry; Ellis, Louis Boissevain; Fair, Arthur Edward; Funnell, Horace Frederick; Gale, Arthur Witherby; Goadby, Howard; Hickman, Arthur Murhall; Holden, Orton; Hyam, Lionel Alfred; Hyam, William Percy; Jackson, Frederic Arthur; John, Henry Bell; Jones, Leonard Reginald; Kaye, Herbert; Kerr, John Murray; Kibblewhite, Henry James Treleven; Kingsford, Percy Hamilton; Lake, Cuthbert Joseph; Lakin-Smith, Ernest; Lee, Ernest Edward Arthur; Lee, Henry; Mallinson, Charles Herbert; Martin, Herbert; Matthews, Robert St. John; Mitcheson, Harry; Molyneux, Frank Eustace; Mortimer, Claude Alick; Oliveri, Felix; Osborn, George; Prior, Henry; Richardson, James; Rickards, Robert Hillier Traherne Anson; Sanders, Cyril Sturgis; Scoble, Herbert Thomas; Simmons, James Edward; Sly, William; Smith, Charles Gordon; Stokes, Hugh Charles; Straker, Howard; Thompson, Claude William George Hugh; Toller, Henry James (passed at head of list); Town, Henry Anandale; Towse, John Stanley; Tregelles, John Allen, jun.; Turner, George John; Walton, Edgar Thomas; Wheatley, Stephen Gladstone; White, Henry Ernest; White, Walter Ernest Coates; Wigram, Henry Joseph; Wilkinson, Frank; Wilkinson, Percy Newton; Wood, John Edward; Wooldridge, Henry Walter; Young, William.

JAPANESE BUILDING.

A MEETING of the Japan Society was held last week, when Mr. F. T. Piggott, vice-chairman of the Council, read a paper entitled a "Note on the Form of Japanese Temple Roofs." He remarked that the curves in the roofs of Japanese temples were about the most difficult things a man could draw. How the Japanese builder succeeded in erecting the roofs passed his comprehension. All the temple roofs, however, were evidently derived from tents, and this led to the interesting question whether the Japanese ever lived in tents. With regard to the "Key Pattern" in Japan, which formed the second subject of Mr. Piggott's address, he remarked that there was no doubt that symbolism played a large part in its formation. There was a remarkable affinity between the development of the Greek key pattern and the Japanese. In the discussion which followed it was pointed out that there was a distinct tendency to avoid the arch in the designs of Japanese builders, although they would pile beams upon beams. One speaker observed that it was a pretty and sentimental idea that the places of worship were first tents or small tabernacles, and gradually, in the same shape, assumed the character of large and permanent temples.

TESSERÆ.

Perpendicular Mouldings.

IN the mouldings of this style a debasing influence will at once be perceived in the comparatively meagre save-trouble method of working them. Large and coarse members, with little of minute and delicate detail, wide and shallow hollows occupying spaces which, in early work, would have been filled with groups of separate mouldings; hard wiry edges in place of rounded and softened forms, and general shallowness of cutting, are all conspicuous characteristics. Add to these that their general arrangement on the chamfer plane, which is a marked feature of the Perpendicular period, gives a flatness which is displeasing to the eye in comparison with the rectangularly recessed grouping of the two preceding styles. At the same time, there is such a mass of really high art in the work of this period that the student must be careful not to slur it over in indulging any predilection he may have formed for earlier work. The mouldings of this style frequently die into a basement composed of the simple uncut chamfer plane, in which case the outer edges of each moulding, of course, coin-

cide with it, since it is only by cutting channels that the mouldings are developed from it. Three peculiarities are so common in Perpendicular mouldings that their absence almost forms the exception to general usage. These are:—(1) A wide shallow casement or hollow, usually occupying the centre of the group, and equal to about one-third of the width; (2) the constant use of bowtells, or beads of three-quarters of a circle, resembling small shafts and often used as such; (3) the frequency of the double ogee and some varieties of it peculiar to the period. The casement alluded to may undoubtedly be regarded as an elongation or extension of the decorated three-quarter hollow, by which width is gained at the sacrifice of depth. Accordingly, it is generally a mark of Early Perpendicular work when the casement is deep and narrow, of late when wide and shallow, and of debased when it is, as it were, so stretched as to become almost or quite a flat surface, sunken just a little below the chamfer plane or external line of the group.

The Study of Old Masters.

An obstacle to the advantage to be derived from the works of the old masters arises from the belief that all has been done that can be done. We are prone to consider the art as an enclosure in which we can only travel in a circle, rather than as a vantage ground from which fresh discoveries in nature may be made. It is easy to add capricious and eccentric novelties of style to what exists; but to present some genuine quality of nature for the first time, or some new combination of what is already known to art, is the great difficulty, and yet it might be oftener and more easily accomplished than it is, if we would allow the art to lead us to nature, rather than erect it into a barrier against all in nature that is not already admitted within its confines. He who believes that nature is not exhausted will, if he truly loves her, find that she is not. It is this faith in her abundance that has caused every revival of art from its slumbers. It was this faith that inspired Rubens and Rembrandt to restore the glories of the Flemish and Dutch schools; not by attempting their exact revival, but by opening new views of nature and creating each a style of his own, which, in spite of many and great faults, has placed them for ever among the most illustrious benefactors of painting. It was the same faith that inspired Hogarth, notwithstanding the most discouraging circumstances that ever genius was surrounded by, to create a species of art unknown to the world before him, and to carry it at once to a perfection precluding all imitation; and it was the same faith in the boundless stores of nature that enabled Reynolds to give a fresh charm to portrait after all that had been done for it by Holbein, Raphael, Titian, Rubens, Vandyke, Velasquez and Rembrandt. It is easy to delude ourselves into the belief that we love art or that we love nature, but the genuine love of both ought certainly to produce such effects as have been noticed, for the great painters mentioned have all achieved their separate triumphs by that unerring instinct of genius which looks to art only as the interpreter of nature, and not as a thing in itself perfect and completed.

Broken Colouring.

In passing through the streets our eyes are attracted by the splendid tints of the coloured liquids in the shop windows of the apothecaries. To a careless observer each bottle seems to contain one colour only, and that the most brilliant of its kind; but, on examination, we find that every mass of colour is made up of a great variety of tints caused by reflection and refraction, and that these are perpetually changing with the change of passing objects; now, in these varieties lies the secret of the delight given to the eye. What is true of these bottles is true of every object, in a greater or less degree, as it is capable of receiving reflections and refractions, the appearance of all things being in some sort modified by surrounding objects. Reynolds occasionally made up tableaux of his most important compositions. When he painted his *Dido on the Funeral Pile*, he put together billets of wood, covered them in part with the rich objects he has introduced into the picture, and placed his model on it, in the attitude and dress of the expiring queen. This arose from no want of imagination, nor with the intention of imitating all the minute details of the objects he thus puts together; but because he knew that a degree of general truth and harmony of light and shade and colour could thus be best obtained, and accidental beauties of combination would, by this means, be suggested which might not otherwise occur to him. In his "Discourses" he remarks on a similar practice by Gainsborough; and should such practices appear to consume time unnecessarily, it can be replied that far more time is often lost in endeavouring to guess at effects, which such contrivances show us at once. Wilkie, in his earlier practice, often made small models of the rooms that formed the scenes of his pictures, with the proper doors and windows, and placed the general forms of his groups and furniture within them, and he had no reason afterwards to regret this as any waste of time, for it contributed to the excellence of his art. When these principles are understood it will be seen at once how it is that nature, though some of her combinations are more beautiful

than others, at no time offends us by those discords we find in badly-coloured pictures; and that we are never reminded by her hues of red, blue or yellow paint. It has always been felt that harmony is the result of breaking of positive colour, and those who have not carefully examined how, and why, and in what degree nature breaks her colours have no other resource left to avoid harshness than to *dull* every tint. They do not observe that, while in some places nature breaks and subdues colour by reflections, in others she doubles and often more than doubles their brilliancy both by reflections and refractions. It becomes, therefore, of great consequence to imitate the appearance of every object with reference to those that surround it. Yet how contrary is, and always has been, the practice of most painters—for they perpetually copy living models in their studios to which landscape backgrounds are added. Queen Elizabeth has been much misunderstood in the saying attributed to her that she would be "painted without shadow." If she even used the expression, she meant, what she said at another time, that she would be painted in "*an open garden light*"—for she saw that there was a great difference between such effect and the effects in pictures. But as the painters of her time could not paint objects as seen in the open air, they painted her literally without shadow. There are portraits by Gainsborough that would perhaps have satisfied her, for some of them really appear as if painted out of doors, and on some of the small figures of De Hooze the effects of open daylight are shown in perfection.

The Supreme Period of Greek Art.

In no other place or time on our globe have so many distinguished and highly-trained intelligences existed within so short a period as Athens can exhibit during the interval between 480 and 380 A.C. Statesmen, generals, orators, historians, such as Herodotus, Thucydides and Xenophon; philosophers like Anaxagoras, Plato, Socrates; dramatists, like Sophocles, Euripides and Aristophanes; artists, such as Ictinus, Mnesicles, Phidias, Polygnotus, Alcamenes and Myron were chief jewels in this precious crown. Among such spirits as these, of whom most, as contemporaries, were in personal contact with each other, how vivid must have been the reciprocal action, both in urging each individual onward and in raising the general tone of all. To what heights of multifarious intellectual cultivation must the human species in Athens have been elevated during that period. Let us now especially contemplate for a moment the position of the architect and of the plastic artist in that age, so auspicious to the ascent of the highest point ever yet reached by human capacities. The kindness of nature had bestowed in abundance the noblest materials in the marbles of Pentelicus and Paros. Mining and commerce brought them brass, gold and ivory. For models of the nude figure, the palaestra afforded incomparable studies in the most beautifully-trained bodies of all ages, from early youth to robust manhood, in varied and voluble motion. For draped figures, in every street, in every square, at rest and in every kind of movement, the richest store of subjects offered themselves to the artist in beautiful picturesque costume. His general mental education was admirably furthered by intercourse with men such as Sophocles and others of those already named. Finally, his moral self-respect could not fail to be infinitely raised in tone by the consciousness that the Hellenes bowed in reverence before the images of gods which he had fashioned; that it was he who bestowed on man the highest of known honours by the production of the iconic statue. A kindred feeling must in like manner have possessed the dramatists when the noblest and richest men of Athens contested the honour of rehearsing the choruses of their plays, and of displaying them at enormous cost, with splendid costumes, while the most select of the highly-cultivated Greeks listened in rapture at the words which they had put into the mouths of their gods, heroes and choruses. Here, too, during this most flourishing epoch, poetry still moves in advance of the plastic art, and both again mutually reflect each other in their chief productions. The sublime *Æschylus* has his counterpart in Phidias, the sculptor of the lofty Zeus—by whose image, as the ancients expressed it, he added a certain new dignity to religion—an image which it was counted by any of the Hellenes a misfortune not to have seen once in their lives; the sculptor, too, of the grave and pensive Pallas—and after Phidias, in Polycletus, the sculptor of the proud and majestic Juno. To the graceful and pathetic Sophocles corresponds Scopas, the sculptor of Niobe, and of the Venus of Milos, the noblest conception of that goddess. The passionate, touching and more sensual Euripides is reflected by the elegant and voluptuous Praxiteles, the sculptor of Venus as the ideal of amorous enchantment, as also of the Eros. But now, when with Lysippus, in his representation of Alexander, the plastic art of the Hellenes gradually descended from gods and heroes to the most consummate exhibition of merely human forms, it kept its place, under Alexander's successors, even while in the service of domineering Rome, until the days of Hadrian, although in a slow decline, yet still at a considerable pitch of

excellence, and thus flourished, we may say, throughout a period of six centuries. This long continuance is chiefly attributable to the delicate tact of the Greeks, which taught them to avoid deviating essentially from any ideal which had once been embodied to perfection, without falling the while into merely servile and spiritless copying. The most ingenious artists, indeed, well know how to make their own individuality sufficiently prominent by an infinite variety of delicate modifications, while strictly adhering to the general character of their standard. In this very circumstance lies one of the most engaging attractions of Hellenic art to its admirers. Hereby, at all events, the universal eagerness for works of plastic art in those ages of Greek antiquity could be qualified in a manner at once becoming and complete—so that all the masterpieces of sculpture, on every scale, from the Colossus down to the smallest coin, and in every material, from gold and silver to baked clay and wood, as well as the finest works and designs of the great painters, were preserved in innumerable repetitions, from the decoration of earthenware vases to the fugitive wall-paintings of the humblest dwellings, even in such a petty town as Pompeii. To this last-named circumstance we owe the preservation to our days of so vast a treasure of the genuine inventions of Greek art.

Novelty in Gardening.

As writers and readers multiply in a language, every plain and easy mode of expression which it affords becomes trite and common by frequent repetition; and certain degrees of vicious refinement and affectation become absolutely necessary to exalt the style above the familiar vulgarity of common colloquial speech; and as this common colloquial speech is constantly extending its usurpations and vulgarising refinement, refinement can only maintain its character and keep out of its reach by constantly retreating from it, and becoming more refined and consequently more affected and constrained; this will be found to be the progress of all highly polished languages. In no art has the passion for novelty had more influence than in that of landscape gardening, or embellishing and improving grounds, of which it appears hitherto to have been almost the sole principle. Whenever this art has been practised in countries only partially and imperfectly cultivated, as in the ancient Persian and Roman empires, and in the modern kingdoms and states of Europe till lately, it always appeared to delight in a profuse display of labour and expense, and in deviating as much as possible from ordinary nature. Rivers, springs, groves, lawns and forests were to be seen everywhere, and the country was covered with fine trees, which exhibited every variety of natural form; but canals, fountains, quincunxes and parterres were only to be seen where art and industry had formed them, and trees cut into the shapes of pyramids and colonnades, men and animals, were new and unusual objects, and such as were only to be found in highly dressed gardens. Novelty, contrast and surprise are naturally so pleasing that every person was delighted with objects of this kind; and as the word beauty is always applied indiscriminately to every visible object that is in any way pleasing, no one hesitated in calling them beautiful. A great writer, Montesquieu, has, indeed, gone still further, and so completely sacrificed both his feelings and his philosophy to the fashion of the day that, in investigating the subject he discovers that surprise, arising from novelty and contrast, is the genuine principle of beauty; and that consequently the Boromean island, in which all these tricks of art are contrasted with wild uncultivated mountains surrounding an extensive lake, is the most beautiful spot on the globe. Another great writer (Burke) afterwards discovered that surprise or astonishment was the genuine principle, not of the beautiful, but of the sublime, which, according to him, is as diametrically opposite to beauty as pain is to pleasure. When Montesquieu and Burke thus differ upon a subject of common sense and feeling, which each had made the particular object of his investigation, who shall hope to escape error in any theoretical inquiry?

Michel Angelo and Ancient Sculpture.

The great artists of antiquity, though they exalt the characters of their gods and heroes above those of ordinary nature, yet, when exhibited in action, they put their limbs and bodies into such postures as such actions would spontaneously produce in common life. Jupiter wields his thunderbolt, Neptune his trident, and Minerva her spear, exactly as we should; but in the figures of Michel Angelo, all is directly reversed. The characters, though remote from ordinary or individual nature, are oftener below than above it in dignity of expression; but then their attitude and gestures are such as ordinary nature never does display under any circumstances, except such as influence it in a painter's or sculptor's study or academy. Even in representing sleep he could not employ a natural or easy posture, but has put Adam into one in which all the narcotic powers of opium could scarcely have enabled him to rest. It was not, however, to conceal any want of industry or science that

Michel Angelo ran into this error, but from an eager and injudicious desire to display knowledge where he should have consulted feeling and expressed sentiment. Though not to be compared even with a third-rate artist of ancient Greece in knowledge of the structure and pathology of the human body, he appears to have known more than any of his contemporaries, and when he made his knowledge subservient to his art, and not his art to his knowledge, he produced some compositions of real excellence. Such are almost all those which he designed for others to execute; such as the *Raising of Lazarus*, the *Descent from the Cross* and the *Entombing of Christ*, in which he lowered the tone of his invention to meet the capacities of the colourists, Sebastian del Piombo and Daniel di Volterra, and thus, through mere condescension, became natural, easy and truly sublime. Where he puts forth all his might, and sacrifices just expression to what is called grandeur of form and outline, he seems to counteract his own ends; for form, considered in the abstract, is neither grand nor mean, but owes all its power of exciting sentiments either of the one kind or the other to the association of ideas. We have learned by habitual observation that certain forms of the limbs and body are adapted to great exertions, and certain forms of the features to great expression, or the expression of great character and lofty sentiment; whence such forms excite grand and elevated ideas of the objects in which they appear. In the abstract forms themselves there is, however, no more of grandeur than there is in so many mathematical lines of similar figure and dimension, for though we extend our ideas of grandeur of character to the forms of inanimate objects, it is still upon the principle of association and sympathy.

Ancient Greek Vases.

It was in the last century that excavations in the cemeteries of Etruria brought first to light large numbers of ancient vases painted with scenes from the mythology and the daily life of Greece. At first they were called Etruscan vases, in spite of the fact that not only their art and their subject, but also their inscriptions, were purely Greek. It is only in late years that the fact has been discovered that they were importations from Greek factories, coming in the earlier period from Corinth or Chalcis, and after a time principally from Athens. We may congratulate ourselves on the fortunate circumstance that the wealthy Lucumones of Etruria thought it in good taste to adorn their houses and to fill their graves with the delightful vessels. Our gain is inestimable. It is true that Greek vases have a language of their own, and probably even well-informed and artistic visitors pass through the vase-rooms of our museums without feeling much interest in their contents. But the language is well worth learning. There is no class of ancient monuments which has risen so rapidly of late years in the estimation of archæologists. The students who take the pains to understand Greek vases soon discover not only that their art is, within the limits which it studiously observes, most admirable, but also that they carry with them more of the flavour of ancient life than even sculpture or coins. They not only give us abundant information as to the beliefs, the cults and the customs of Greece, but they put us at once, if only they have escaped restoration in modern Italian workshops, on terms of friendship with the potter who moulded and the painter who decorated them. Clay, with its marvellous durability, preserves for us not only the ultimate design of the worker, but his first sketch, his second thoughts, his mistakes and carelessness, his happy inspirations, and the obstacles which interfered with their realisation. A vase bears the same relation to a sculptured relief which a diary bears to a formal historical treatise. It is more local, temporary and personal, and at the same time vases are among our most serious documents in matters of mythology and mythography. Every year they are used more and more for comparison with the plots of the tragedies of Æschylus and Euripides and the lyric tales of Pindar. Writers now apply the test of vases, as they are perfectly justified in doing, in order to determine the comparative antiquity of various versions of Attic myths and their popularity among the people. How far brighter and fresher is this source of knowledge than the musty, pedantic pages of an Apollodorus or a Hyginus.

Bacon and Gray's Inn Gardens.

In the 40 Eliz., at a pension of the Bench, "the summe of 7*l.* 1*s.* 4*d.* laid out for planting elm trees" in these gardens was allowed to Mr. Bacon (afterwards Lord Verulam and Lord Chancellor). On November 14, in the following year, there was an order made for a supply of more young elms; and it was ordered "that a new rayle and quickset hedges" should be set upon the upper long walk, at the discretion of Mr. Bacon and Mr. Wilbraham; the cost of which, as appeared by Bacon's account, allowed April 20, 42 Eliz., was 6*o*l. 6*s.* 8*d.* Mr. Bacon erected a summer-house on a small mount on the terrace, in which, if the conjecture may be allowed, it is probable he frequently mused upon the subjects of those great works which have rendered his name immortal.

NOTES AND COMMENTS.

THE designs sent in for the new municipal buildings in New York present offices which would cost a far larger sum of money than was contemplated. The newspapers in consequence are almost unanimous in condemning the action of the architects who have aided the Commission as an advisory committee. The Architectural League of New York have held a meeting to express confidence in that committee, when the following theory of the principle of competition designs was enunciated:—"Competition drawings can under no circumstances be more than elaborate sketches; the object of a competition is fully accomplished if a plan is selected which in its general features of design, both in ground plans and elevations, conforms with the instructions given and offers a project which, with careful study and without any radical departure from the original scheme of the design, may result in the construction of a thoroughly satisfactory building." As several designs in a competition are always likely to bear that sort of approximation to the contemplated satisfactory building, opportunities would be given by the adoption of the theory for the exercise of that sort of diplomacy which is familiar in America.

IN the annual report of the Institute of Fine Arts, Glasgow, it is again announced that the Council have resolved to hold in the galleries during next summer and autumn an exhibition to illustrate the history and progress of Glasgow from the earliest times until the middle of this century. An influential committee, composed partly of members of Council and partly of outside experts interested in the history and archaeology of Glasgow, will organise the exhibition. The Council appeal to all members who have Glasgow relics in their possession to lend their treasures to the Institute, and so aid in its success. The exhibition will be one that will appeal strongly to all who take an interest in the story of the development of the city. The Council have been informed that the late Mr. D. E. OUTRAM, once chairman, had bequeathed 5,000*l.* to the Institute. The membership is 717, of whom five are lady members and ninety-one artists. After many years of struggle the position of the Institute is becoming every year more assured, and its importance in the world of art more and more recognised. Art in Britain owes much to the Institute. It rests with the members and the general public to do their utmost to further its material prosperity, and so aid in increasing its working power and extending the sphere of its influence.

ABOUT a league from Metz will be found the remains of the aqueduct which at one time was supposed to have been constructed by the Roman legions in the time of DRUSUS, whose monument is at Mayence. Of late the work is supposed to date from the time of CONSTANTINE THE GREAT. The aqueduct was employed for the water supply of Metz (Divodurum). The part that has survived is in the valley at Jouy, but it is not one continuous part. Near the village are six arches, and at a distance are ten others. The spans are not uniform. The material employed was stone, which was cut to the size of the ordinary Roman bricks. The piers are rather flat, and vary in width. The aqueduct was carried over the Moselle, but that portion has been removed. While the French possessed Lorraine the aqueduct received less attention than it deserved; from its simplicity it was undervalued. The Germans have, however, resolved to preserve so important a memorial of the Roman invasion, and, under the direction of Herr TORNOW, a careful restoration has been in progress during the past two years. The safety of the aqueduct is therefore secured.

A MEETING of the Jewish Historical Society was held on Sunday, when the Chief Rabbi read a paper on MANASSEH BEN ISRAEL, the learned Portuguese Jew of Amsterdam, who conferred with CROMWELL about the return of his people to England, and if he failed with the officials, was rewarded with a pension of 100*l.* a year, payable quarterly. When a mere boy MANASSEH attracted crowds to hear him preach. He wrote in ten languages, was versed in theology, classics and medicine, and printed his own books. He established the first Hebrew printing-press in Amster-

dam. One of his most intimate friends was REMBRANDT, who took up his residence near the Jewish quarter, so that he might make a study of Oriental types of countenance. In 1636 REMBRANDT etched a portrait of his friend, which disclosed the kindness and intelligence of the Jewish divine, and fully corresponded to a description of him given by THOMAS POCKOCK. In 1655 REMBRANDT sketched four small etchings to illustrate one of MANASSEH's theological works. The paper suggests that if some enthusiastic Jew would investigate the traditions which may have survived among his people in Amsterdam, the darkness which surrounds REMBRANDT's relations with their ancestors might be removed.

So many town councils and local authorities have discovered that, owing to the competition between architects it is not risky to act illiberally towards one of the profession, we need not wonder if in Rochdale it is sought to play a similar game with painters. It is so rare to have the chance, perhaps the Rochdale Council will be envied by other bodies. In the Town Hall was a painting of the *Signing of Magna Charta*, which was damaged by the fire which occurred some years ago. A claim for 360*l.* was sent in to the insurance company on account of the picture; but all that was paid was 339*l.* 10*s.* Mr. HENRY HOLIDAY was asked to repaint the work, and he agreed to do it for 210*l.*, which left a substantial profit to the Corporation. The artist, however, introduced additional figures, for which he asked to be paid 50*l.* as an extra; the Council gave him one-half that sum. Mr. HOLIDAY, we suppose, was not satisfied with his treatment, and claimed 38*l.*, thus making the extra work amount to 63*l.* By a large majority the Council decided to pay no more money. It is not denied that the commission has been creditably executed, but we suppose the Council wish to have the satisfaction of gaining at least 100*l.* by their arrangement. As the General Purposes Committee have sanctioned Mr. HOLIDAY's claim, the action of the Council becomes more shabby.

It would be a novelty to hear a learned judge speak in praise of the Courts of Justice in the Strand. The fall of a fragment of Mr. Justice LAWRENCE's Court one day last week enabled his lordship to indulge in the prophecy that some day the whole building would tumble down. Mr. J. M. KNIGHT, who was giving evidence at the time, expressed confidence that he was not to be overcome by falling masonry, and declined to leave the witness-box. While the Strand building has no friends, the new Birmingham Courts appear to the judicial mind to be a model of convenience. This was shown by the advice offered to the Cardiff Town Council. New courts will shortly be undertaken in that town, and as soon as the project was mentioned to Mr. Justice HENN COLLINS, his lordship offered various suggestions. Mr. Justice WILLS recommended that the architect who was selected for the work should study the Birmingham Courts, which his lordship as well as other judges regarded as the best in the country. The safest course to adopt would be for the Cardiff Corporation to give the commission to Mr. ASTON WEBB.

A MEETING has been held by the North-East London Property Owners' Association, at which it was resolved "That this Association looks with dismay at the proposed Bill 'To consolidate and amend the enactments relating to Streets and Buildings in London,' introduced by the London County Council, and considers some of its provisions unreasonable and confiscatory." Wholesale condemnation of that sort cannot have much weight with Parliament. If the Association condescended to give some indication of the provisions that are so obnoxious, it would show a better knowledge of tactics. The Bill deserves to be carefully considered by every inhabitant of London. As copies are expensive, a handy abstract has been prepared by Mr. H. C. JONES, clerk to the Board of Works for the St. Giles's District, with the aid of Mr. GEORGE WALLACE, surveyor to that authority. It is better adapted for general use than the Bill, for it gives the sense of the clauses in a more pithy form. Moreover, it shows the relation of the Bill to the existing Acts and the extent of the new legislation which is sought by the County Council.



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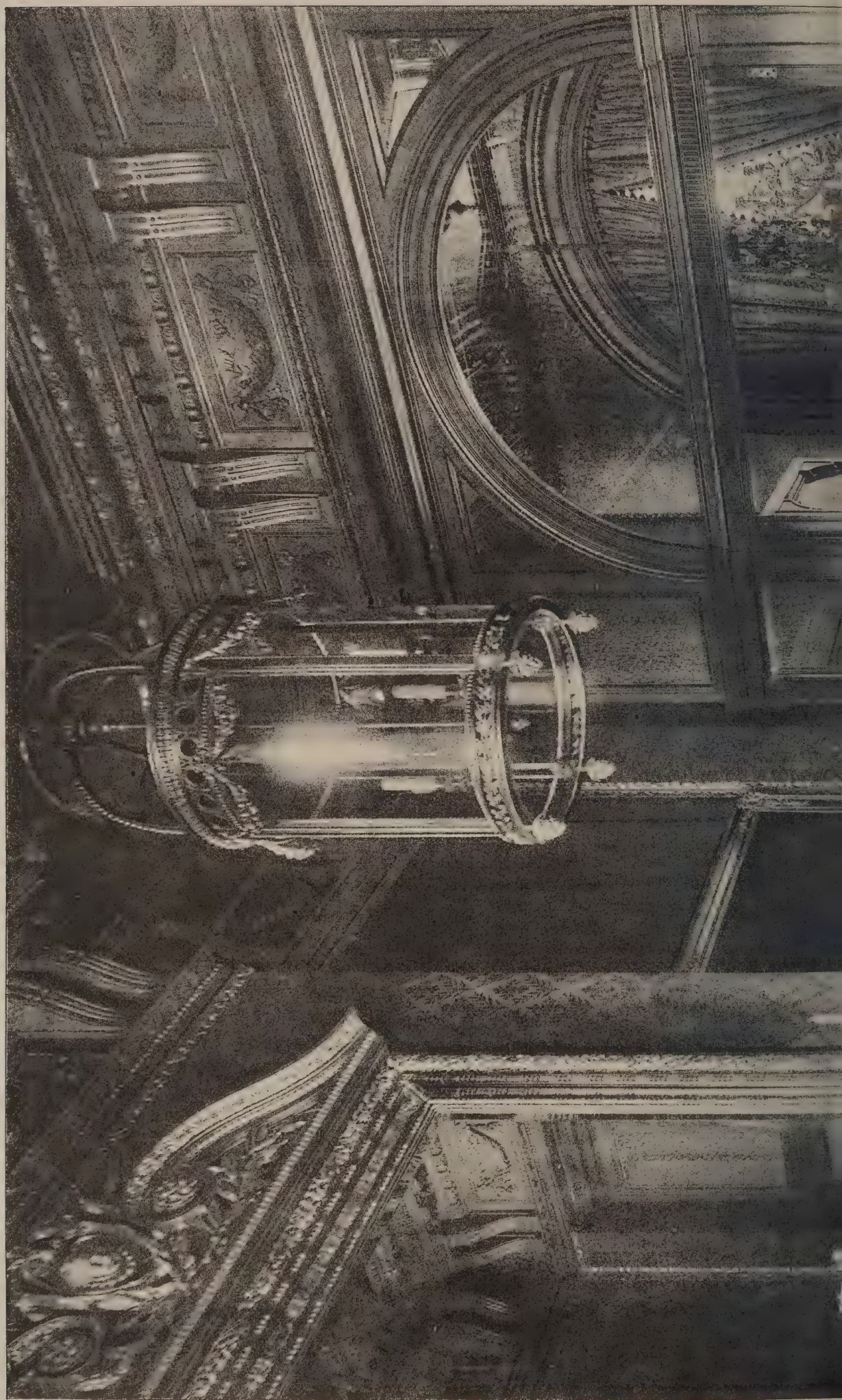
9th 1894.



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GROSVENOR SQUARE.

The Architect, Feb. 9th 1894.





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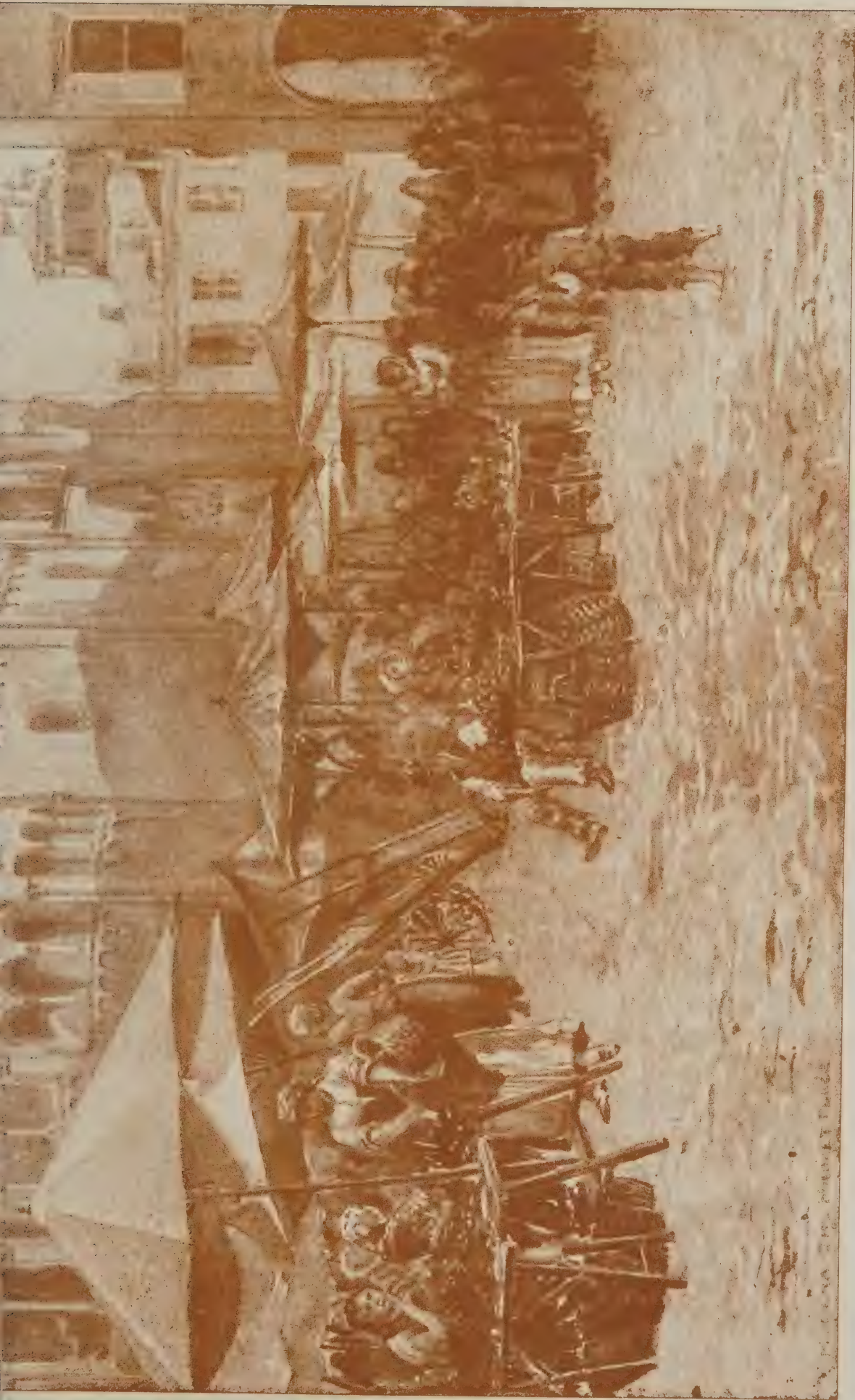
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"HALTON," HERTS.—THE ENTRANCE HALL.

The Seat of ALFRED DE ROTHSCCHILD, Esq.

The Architect, Feb 9th 1894.





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MODENA: THE MARKET PLACE.

By F. W. BEDFORD.

ILLUSTRATIONS.

SHOW-ROOM, DUKE STREET, GROSVENOR SQUARE.

HALTON, HERTS.—THE ENTRANCE HALL.

MODENA.—THE MARKET PLACE.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

The following gentlemen were elected members, viz. Messrs. C. H. Havers and J. H. K. Loas.

Mr. Fellowes Prynn was nominated to fill a vacancy on the committee, caused by the resignation of Mr. H. O. Cresswell, the election to take place at the next ordinary meeting.

Party Walls and Party Structures.

Mr. WOODTHORPE said:—It is with considerable diffidence I approach this subject to-night, one so full of interest to many of us, and one that contains so many points and questions upon which there seems to be very considerable difference of opinion among architects, surveyors, and lawyers (including even judges). The subject is such a very wide one that I have found it absolutely impossible to give in this paper anything like a full account of the many cases that are well worthy of consideration and likely to arise. My chief reason for choosing this subject was, that I thought it would be one likely to raise a good discussion; and it is most essential on questions of this kind to have as many different opinions as possible. It is also necessary for every architect practising in London to know something about this question and the necessary procedure thereon. Remembering that the majority of my listeners are probably either engaged in practice in London or likely to be so engaged in the future, I have treated the question mainly from a London point of view, and propose to divide the paper under five heads, as follows:—

1. The ancient statutes made from time to time, now repealed.

2. What is a party wall? (Illustrated by cases.)

3. The statutes and enactments now in force regulating party structures in London, mainly those that treat of the rights of building and adjoining owners, at the same time giving notes of some of the many superior court decisions which affect the subject.

4. The usual procedure.

5. The Bill to consolidate and amend the enactments relating to streets and buildings in London to be introduced by the London County Council as a private Bill in this next session of Parliament, so far as it affects the rights of building and adjoining owners.

I. Some of the Ancient Statutes.

I think it might be interesting to some of you to hear a few of the earliest enactments that affected this question, so, by way of introduction, I propose to take you back to the first record that I have been able to trace of any enactment concerning party walls:—

In the year 1189, in the time of Henry FitzAlwyn, the first mayor of the city:—"One great thing done in the time of this first mayor was about settling laws and orders for buildings in the City. And there still remains in the books of the chamber the order how to proceed in the assize concerning buildings between neighbours. It was provided and ordained by the discreeter men of the City, to appease contentions which might arise among neighbours in the City, upon inclosure between land and land; that twelve men, aldermen of the City, should be chosen in full hustenge, and there sworn that they would faithfully perform it, and come at the mayor's summons, unless hindered by some reasonable cause, and to be present with the mayor for executing the foresaid business. By these sworn men, orders were taken about party walls and about building them 16 'foot,' at least, in height and 3 'foot' in breadth, and to build them of stone for security against fire; and, concerning gutters, to receive and convey the water from their houses—all to be at common cost. Also concerning digging pits for water; concerning making windows 'upon' the neighbours; concerning putting corbels, *i.e.* girders or beams, into the neighbour's wall," &c. Note the curious meaning here of corbels, and also the expression "windows upon neighbours," meaning, I take it, ancient lights. It does not seem that this enactment, as to having party walls of stone 3 "foot" in breadth and 16 "foot" high for security against fire, was very strictly enforced, otherwise we should not hear of the divisions of timber that existed before the Fire of London.

The next records I can find of enactments concerning buildings were in the reign of Elizabeth, and contained in a strict proclamation to prevent overcrowding of buildings, and to abate the "embattling" of houses, yet to small effect; but there is no mention of any party division walls, though there were commissions granted "for the suppressing of hedges, ditches, and other such enclosures, to the hindrance of artillery, though the owners of the land were tenants in fee simple." There was also a proclamation in the second year of James I., in 1605, forbidding all increase of new buildings within the City and one mile thereof, and likewise commanding all persons henceforward to build their forefronts and windows either of brick or stone, as well for decency as by reason all great and well-grown woods were much spent and wasted (as timber for shipping waxed scarce). But this also had little effect. From this time began the new reformation of building, although it does not appear to have had much effect in preventing the spread of fire, and it seems apparent that any enactments that were in force to divide neighbouring buildings by walls had been allowed, by not being enforced, to lapse, as I can trace nothing else on the subject until after the Fire of London, though there was another Act in the year 1656 against overcrowding buildings outside the City, part of which I quote.

In the year 1656 an Act was made for the preventing of the multiplicity of buildings in and about the suburbs within ten miles thereof. The preamble sets forth how these new buildings, outhouses and cottages were found to be mischievous and inconvenient and a great annoyance and nuisance. This enacted that for every dwelling-house, outhouse, &c., erected at any place within ten miles of the wall of the City and not having four acres of land at least there should be paid one year's rent at the full and improved rack'd rent. And all that should after this build any house or cottage within ten miles should forfeit the entire sum of 100*l.* and 20*l.* per month so long as such house should be continued. After the fire in 1666 there was a long Act of Parliament for rebuilding the City; to carry out the enactments the Lord Mayor and Court of Aldermen nominated and appointed discreet and intelligent persons in the art of building to be surveyors or supervisors, to whom an oath was administered for the true and impartial execution of their office. This Act set forth that: "There shall be party walls and party piers set out equally, on either builder's ground, to be built upon by the first beginner of such building, and that no man be permitted to build on the said party wall, or on his own continuous ground, until he hath fully reimbursed the said first builder the full moiety of the charges of the said party wall and piers, together with interest at 6 per cent., to be accounted from the beginning of the said first building." The party walls by this Act were made thicker than the external walls. This Act also provided "That the surveyors shall take care for the equal setting out of all party walls and piers, and no person be permitted to build until that be done, and the builder was required to pay to the Chamber of London 6*s.* 8*d.* before the foundation was laid." At the same time the Common Council made regulations against fire. Some of these are very quaint. I will read one:—"That every alderman who hath passed the office of Shrievalty provide twenty-four buckets and one hand squirt of brass, and those who have not been sheriffs twelve buckets and a hand squirt, to be kept in their respective dwellings; and every other person being a subsidy man to keep in their houses a certain number of buckets according to their quality, and every man in case of alarm of fire had to turn out to his door with a bucket full of water ready to hand.

The next Act dealing with party walls was in the sixth year of Queen Anne, and made the regulations more stringent; and in the following year, the seventh of Queen Anne, a further Act was passed enacting that "the party walls were to be wholly of brick or stone, except door-cases, windows, lintels," &c., and be built "9 inches on each man's ground," and giving the first builder power to pull down the old wall, whether it was of brick, stone, or timber, and build a new wall, the owner of the next house paying for same at the rate of 5*l.* per rod. Next we come to the Act of the eleventh year of George I., in which it is provided that "if any person refuse or neglect to build his share of a party wall after due notice given him, his next neighbour may build it for him and oblige the person so neglecting it to pay the charges of rebuilding."

A three months' notice is required by this Act when the parties cannot or will not agree, and each party, after notice, was required to appoint two workmen (instead of, as now, one surveyor), to say whether the wall was a sufficient or sound wall; but it was sometimes found difficult to get the workmen to agree, and so in a further Act in the thirty-third year of George II. provision was made for a fifth "able workman" to be called in. However, this method was not found to work well.

A further Act was passed in the sixth year of George III., which enacted "that any person who shall build next adjoining thereto and make use of the party wall thereof, shall pay to the person or persons who hath the property in such wall

one-half of the value of such wall or of so much thereof as such person shall make use of, to be estimated and determined by two indifferent persons."

I might remark here that it seems to me a matter of regret that this provision has not been handed down to us and included in the present Act.

A further Act was passed in the twelfth year of George III. to consolidate the previous Acts as to party walls. It enacted that they should be still built half on each owner's soil, but their thickness was to be "according to the cost of the houses." This seems rather a curious regulation. The next Act was in the fourteenth year of George III. and repealed the last Act. In this Act buildings were divided into seven classes, and iron doors were first required to openings in party walls. This Act was repealed in 1844.

Now we come to the 1844 Act, the last one no longer in force. I cannot help thinking there are several enactments of this Act that had been better inserted in the 1855 Act; for instance, in section xxviii. (that dealt with damage arising from the erection of an external wall against a party wall), the building owner had certain rights to excavate the ground against the party wall, but only on condition that he underpinned the party wall; and in section xxxi. the building owner had a right to raise the party and the external walls and chimneys; but if at any time the adjoining owner wished to make use of any portion of the part so raised, it was lawful for the owner of the premises so first raised to recover the cost of a proportionate part of the portion so used together with such parts of the chimney-stacks. This seems a very fair and necessary regulation, and was contained in many of the old enactments, but for some reason or other omitted from the present Act. This Act of 1844 assigned to the official referees and district surveyors the parts now taken by the one, two or three surveyors.

In certain cases it also allowed "reasonable compensation" for any loss which the adjoining owner suffered by reason of the work of the building owner. It also gave a right to the adjoining owner of land abutting on other premises for further protecting his interest, where the building owner opened windows abutting on the adjoining owner's ground; to serve notice on the building owner calling on him to stop up these windows; if the building owner failed to comply, then the adjoining owner had the right to brick them up himself, and recover the costs of same. I have always understood from architects who practised under this Act that except in some few instances it worked fairly well, and the official referees formed an excellent tribunal, which I hope some day to see restored in the form of a special court. It has been inserted in the proposed Bill.

2. What is a Party Wall?

The definition of party wall given in the Metropolitan Buildings Act, as you all know, is as follows:—

"Party wall" shall apply to every wall used, or built in order to be used, as a separation of any building from any other building, with a view to the same being occupied by different persons. The first point that strikes one about this definition is that if it gives an adjoining owner a right of user of a wall that has been erected by the building owner by his placing a building against such wall, if it is allowed to remain, he, the adjoining owner, acquires a right of enclosure, and the building owner will find it very difficult to get of this right. An acquired right of this kind cannot be too carefully guarded against in the first instance; for by the judgment of *Angus v. Dalton*, which is a House of Lords case, "after twenty years' uninterrupted user of support, if it be open and not surreptitious, by the Prescription Act the owner of the dominant tenement is given the indefeasible right of support for his building from the land and building of the servient tenement."

I will explain shortly a case by an illustration. A has a house, bounded on one side by an external wall, *xx*, built entirely on A's land, and in this wall A has windows above the ground-floor which have existed for over twenty years. B one day erects a lean-to building that does not affect any lights or injure in any way A's wall *xx*. After twenty years B acquires a right of user and enclosure in A's wall, and therefore practically he acquires a small slice of land. This really might be the effect of the doctrine in the case of *Angus v. Dalton*. A's only remedy, it seems to me, in the first instance, being either to restrain the adjoining owner by an injunction (which would be difficult to obtain, as the wall has not been interfered with or in any way damaged), or to pull down his own wall (which of course would be absurd) so as to prevent the right being obtained.

Several cases similar to this have come to my knowledge, and the losing, practically, a slice of land might not, perhaps, be A's only hardship. Suppose, for instance, A wishes to pull down his building and rebuild. Section xvii. of the Metropolitan Buildings Act says, "And every party wall shall be carried up above any part of any roof opposite thereto and within four feet from such party wall;" and section xiii., "But no opening shall be made in any party wall except in accordance with the rules of this Act."

If these sections are to be read literally, A will be debarred from having any windows in his own wall, as now it has become a party wall under the definition in the statute. This is a case that I am inclined to think sometimes arises in this way. A, perhaps, is a neighbourly man, and on good terms with his neighbour, and is not to his knowledge in any way interfered with by the lean-to put up by B, nor does he understand the rights he may lose, and probably does not even know that B has not a wall of his own inside under his roof, and the difficulties do not arise until A wishes to take down his building and rebuild.

Now the question we have to consider in respect of this wall is, first, Has the upper part above the lean-to, namely, that part that encloses A's building, become a party-wall? It certainly does not separate two buildings at this point, and is entirely built by A on his own land. I think that the well-known case of *Weston v. Arnold*, though a Bristol case, must apply to a case of this sort in the Metropolis. In that case it was held that where a wall for a few feet from the ground was the dividing wall between two houses, and above that was the outside wall of one of them, the lower part might be a "party wall," and the upper part was not. A wall might be a party wall within the meaning of the Bristol Improvement Acts, 1840 and 1847, for part of its length or height, and an external wall for the remainder of its length or height.

There is another case, namely, that of *Knight v. Pursell*, and it was there held that "so far as the buildings extended on both sides of the wall it was a party wall within this Act," namely, the Metropolitan Buildings Act. Now, how are we to answer the question, Is the upper part above the lean-to a party wall? I think in the face of the Bristol case, which, though a local case, interpreted Acts which contained provisions somewhat similar to the clauses in the Metropolitan Buildings Act, namely, that there should be no openings in the party walls except under certain conditions, and in the face of *Knight v. Pursell*, and after reading the definitions of party wall, I should say, No; the upper part is not a party wall, but an external wall—that is, of course, from 15 inches above the top of the lean-to upwards. The second question is, Can A have his windows again?

I think so, certainly. The Bristol case of *Weston v. Arnold* again helps us here.

A wall in Bristol separating buildings, but having in it, above the buildings, windows enjoying rights of light, was condemned as a party wall under the local Acts, on proceedings taken by the owner of the light, and ordered to be rebuilt. The Acts contain provisions that there shall be no openings in party walls of new or re-erected buildings, except iron doors for communication between the separate buildings. It was held that the Acts did not apply to these windows, and that the owner of the lights could maintain a suit to restrain the erection of a building that would interfere with them; also in *Crofts v. Haldane*, and this is a London case. It was there held that the right to raise a party structure does not authorise the raising of a structure so as to obstruct ancient lights in the adjoining premises, and Mr. Justice Blackburn said, "There is a series of enactments in Part iii. of the Act (*i.e.* the 1855 Building Act) which do, for obviously good reasons, enable the building owner to deal with party structures in a way in which he would have no right at common law; but there is not one word in them to indicate an intention that he shall be at liberty to raise a wall so as to interfere with a neighbour's right to light, any more than there is to take his land."

This view also seems to me to agree with the definition of party wall, namely, a wall used as a separation of any building from any other building. I do not think anyone could say that that portion of the wall *xx*, some 40 feet above the lean-to building, was a separation between two buildings. Either we must accept in London the Bristol case or sections xiii., xvii.; and definition of party wall cannot always be complied with literally without great injustice.

I will give another example, while we are considering this question, of what is a party wall. *Y¹ Y²* is a party wall separating two buildings belonging to E and D, and supported on girders, stanchions and piers. F is a public passage at ground floor, E has a shop front between *Y²* and *Y³* next public passage; D takes his building down, and wishes to erect a higher building. The party wall *Y¹ Y²* is insufficient in thickness and strength for the greater height and weight, and the stanchions and foundations that are in E's building are insufficient in strength for carrying the greater weight to be placed on them. E objects to have his ground floor or shop front or his basement interfered with at all. D has a right to take down the party wall if insufficient, but of course he must go through the proper procedure; but has he a right to go into E's premises and build up sufficient piers and stanchions to carry the extra weight he proposes to place on them? I think not, without E's consent, and probably E would not allow him to do so without adequate compensation, as I do not think it could be maintained that the lower part is a part of the party wall, though there is certainly a right of support thereon.

This is a very difficult case, and one which I do not think

the Act provides for, and the only way in my opinion to arrive at a satisfactory settlement would be to place the whole matter, including the easement of support from the external part below first floor, before the third surveyor, and for the two surveyors to abide by his decision on the whole case, and to agree to sign the award; but even then the award might not be altogether in accordance with the Act, and if either D or E did not agree to it, it might be upset.

While we are on the question of what is a party wall, I shall read what Mr. Justice Fry said in the case of *Watson v. Gray*, which was a Middlesbrough case:—"As to the meaning of 'party wall' in a conveyance, it has a meaning 'rather popular than legal.'" He goes on to say the word "party wall" may be used in four different senses:—

1. A wall of which the two adjoining owners are tenants in common; this is the most common and the primary meaning of the term.

2. A wall divided longitudinally into two strips, one belonging to each of the adjoining owners.

3. A wall which belongs entirely to one of the adjoining owners, but is subject to an easement in the other to have it maintained as a dividing wall between the tenements.

4. A wall divided longitudinally into two moieties, each moiety being subject to a cross easement in favour of the owner of the other moiety.

As this case was a Middlesbrough case, and does not affect us here in London very much, except so far as party fence-walls are concerned, I do not intend to go very deeply into it, but if anyone wishes to see the case he will find it fully reported in Professor Banister Fletcher's book. Shortly it was this:—The plaintiff occupied a house; the defendant occupied another house adjoining. The yards adjoined at the rear. The plaintiff erected a shed against the wall, and raised the wall between the yards. The defendant knocked down with a hammer the raised portion of the wall. The plaintiff then brought an action for damages.

Mr. Justice Fry said:—"I am of opinion that the wall in this case belongs to the plaintiff and defendant as tenants in common; either tenant might have wished to train fruit trees there, or to amuse himself by running along the top of the wall," so the defendant was quite within his rights in knocking the raised portion of the wall down.

Mr. Beadel, in his able paper on the subject read before the Surveyors' Institution, gives the apt illustration of the showman Barnum, which I shall quote here. The showman Barnum and his partner had an elephant used for exhibition purposes; the partner not handing over to Barnum his half share of the profits thus arising, Barnum threatened if he did not do so that he would shoot "his half" of the elephant. There he was wrong, as he could not kill his half without injuring his partner's half, and, therefore, wronging him. So it is with a party wall; the owner on one side, if he damages the wall, though on his own side, injures the enclosing wall of his neighbour's house, and therefore it is only right and necessary that he should be restrained by enactments from doing any injury to what is really part of his neighbour's house.

(To be continued.)

At the conclusion of the paper, after remarks from Mr. J. Douglass Mathews, Mr. H. Lovegrove, Mr. Bernard Dicksee, Mr. White, Mr. Blashill, Mr. H. C. Clarke, Mr. Cole, Mr. Huntley Gordon and Mr. C. H. Bedells, a vote of thanks was passed by acclamation to Mr. Woodthorpe.

LEEDS ARCHITECTURAL SOCIETY.

AT the meeting of this Society, held on Monday in the Law Institute, Albion Place, Leeds, and presided over by Mr. G. B. Bulmer, a paper entitled "Notes on Some Bavarian Towns" was read by Mr. E. Guy Dawber. Sketches and photographs of streets, buildings, &c., were shown on the screen, and served to illustrate the lecture. Mr. Dawber took his audience through some of the quaint old towns around Wurzburg. For the artist as well as the architect, he said, there could not be a richer field. The houses in Rothenburg, although plain on the outside, had courtyards of great interest. The churches were exceedingly quaint, and the interiors of some were magnificent. At Wurzburg the bridge spanning the river was a feature of special interest. On it were rows of stately statues. The glory of Aschaffenburg was the palace standing on a noble terrace overlooking the river. Frankfort contained some beautiful examples of slate-hung houses. He remarked that the small slates used are, perhaps, preferable to the large ones of England, and that the slates used here are often greatly out of scale with the walls underneath them. A vote of thanks to Mr. Dawber was accorded on the motion of Mr. Dodgshun, seconded by Mr. C. Hall. In responding, Mr. Dawber said Rothenburg was simply a museum of beautiful architectural specimens. For an architect it was a perfect place.

ADAM ARCHITECTURE IN LONDON.*

By PERCY FITZGERALD, M.A., F.S.A.

(Concluded from last week.)

DESCENDING from general principles, we now come to his particular works. His first really important enterprise was the daring and ambitious scheme of the Adelphi—that is, the raising on the low-lying shore of the river a large and handsome quarter which should be on a level with the Strand.

My friend Mr. Wheatley has described this enterprise in an interesting monograph, and has dwelt particularly on the enormous underground structures which support the streets. These vaultings and arches are quite cyclopean in their character. The very areas of the terrace are like houses, and a couple of storeys in depth. The design of the terrace itself, thus raised in the air with its side streets, is really imposing. We at once recognise that the inspiration came from the palace at Spalato. Most of us will recall the fine effect when it overhung the river, from which it is now removed a long way. The houses which were occupied by Garrick and other persons of consideration are fine and spacious, and the rooms beautifully proportioned.

The Adam buildings have suffered so much from alterations and additions, that it is difficult now to form a correct idea of their original appearance. The pilasters and ornamental work are usually painted over, thus destroying the original natural tone of the stucco and the effective contrast between it and the brick. In this quarter of the Adelphi we have even a shop designed by him—Mr. Attenborough's.

In St. James's Street we often pass by without notice a rather uninteresting building, Boodle's Club, but where the great central window clearly proclaims its purpose—a large chamber within where the members could assemble. Mr. Fergusson bestows almost extravagant praise on the University Buildings in Edinburgh, which he commends for their perfect good sense and sincerity of expression. "The centre is bold and well marked and ornamental, without any feature so gigantic as to overpower the other portions." The wings are properly subordinate, and the arch at the bottom supplies a little piquancy. The cornice, he objects, is rather too slight. But on the whole, he says, "there are few buildings so truthful and so well balanced in design, or so satisfactory."

It will be interesting now to see what Adam has done in the case of a private mansion. In St. James's Square, on the club-house side, is found one of the most pleasing and effective of his works, the residence of Lady Williams-Wynn. Here he seems to have been allowed a free hand, and the result is most satisfactory. This stately house is at once solid and ornamental. We have his "large" style, and at the same time all those special ornamental graces in trifles of which he was a master. There are arches over the rectangular windows on every storey which, as the house is of stone, suggests strength. They really do duty in the way of support. The area windows have very marked arches a foot deep, which is fitting, as they have to bear the whole weight of the mansion. The arches of the parlour storey are less pronounced, as they have less weight to carry; those of the drawing-room still less; while the top storey, having no weight to carry, has no arches. This treatment gives, as in the case of Gosford House, an animation and life to the face of the house. Then there is the doorway with its graceful fanlight and expanding steps. Adam excelled in fanlights, though modern owners invariably remove them and substitute plate-glass. Instead of bold mouldings on his doors, Adam was partial to a sort of fluted pattern, which supplied richness of detail. The original knockers even of his design are here. Note also the fan-like flowing line of the stair-railings and the balconies, which have a logical purpose, simply as a support to rest on as you look out of the windows. I pass over the fine original stair, the beautiful chambers with their graceful alcoves crossed by columns, the charming little dressing-rooms and circular or hexagonal chambers. The whole is a masterpiece that will give pleasure to any one of true taste.

The Adams built a vast number of these stately mansions or palaces for the nobility. The most important of these was Scarsdale House—almost a palace—and which Dr. Johnson said would serve admirably for a court of justice. It is of a rather conventional pattern, and shows little of his peculiarities. Luton Hoo, which he built for Lord Bute, and which now belongs to the Danish Minister's wife, is rather conventional, though there is a pleasing piquancy in the semicircular portico.

But we find the most favourite—almost stereotyped—Adam type in Lansdowne House, Berkeley Square; that is, an ordinary square mansion with wings, decorated merely with a pediment and pillars and with wings added, originally built for

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Lord Bute, a valuable patron, who then built two palaces from the designs of the same architect. Of this type, also, is Kenwood, Lord Mansfield's place at Highgate. They are what might be called good, workmanlike patterns.

At the bottom of Stratford Place is a house of similar pattern, very pleasing, from its correct proportion and its elegant colonnade. This harmonises with the place itself. The whole was built for Lord Aldborough, for whom he also built a more magnificent house in Dublin, one wing of which was a theatre, the other a chapel. It is now used as a barrack.

Adam's touch was always light and elegant, and was shown even in altering or remodelling existing structures. There was an ugly building in Whitehall—the old Admiralty—with an ungainly portico, the columns of which are out of all proportion, and for this he supplied a screen, which most of us will notice as we pass by every day. I was always puzzled at the praises lavished on this work, which was extolled as a great classical work. Its three openings seemed unmeaning enough. Examining it closely, I found that the pillars had been removed to make these side entrances, and that the architecture had been completely spoiled by the alterations, which destroyed its character as a screen. The old picture of the structure shows how different it looks when it was a real screen. But this is not all. The original design with its decorations seems really an elaborate and most effective one, and its present condition is a good instance of the way architects suffer from official interference with their designs; for all the ornamentation was suppressed.

I will give some other specimens of his delicate touch as applied to trifles. He built a bank for Mr. Coutts, the banker, in this quarter of the Adelphi. It was desired that he should connect the buildings by a bridge which crossed the street. We know what flimsy things these usually are—glass passages, ungraceful and uncomfortable to look at or to cross. Adam felt that, in the case of a bank, solidity and an air of solid security were the proper associations, and his bridge accordingly has an air of perfect propriety, and is almost Venetian in character. The eye rests on it with perfect satisfaction. The adjoining buildings have the same correctness, and even picturesqueness, expressing exactly, with their circular windows, the notion of the strong-room of a bank. In such matters as stabling, coach-houses and yards he always shows the same simplicity and effective design.

In Mansfield Street, out of Portland Place, is to be seen a little back yard with a coach-house that was inconveniently close to the back drawing-room. Not much can be made of a back yard, but with a few touches he made it an object pleasing to view. The whole is pleasing; the curves very graceful. Close beside Inigo Jones's Banqueting Hall, in Whitehall, stands the old, dilapidated United Service Institution. I have discovered that this was the joint work of two eminent architects, Sir John Vanbrugh, the builder of Blenheim and Castle Howard, and of Adam, who supplied the two rather insignificant wings. Here he certainly failed, just as he did at Finsbury Square, which is certainly a rather deplorable piece of work.

Sometimes to add an attraction to the front of an old house he would design a little lodge and railing. These ornaments were always effective. Other architects deal with such things in a rather ambitious way, and make Greek temples in miniature, like the Park lodges—just as Goldsmith said of Johnson, that if he were to write a fable on the little fishes he would make them talk like whales. There is a specimen of this class of work in front of the War Office, which shows power of expression, and another in front of Ashburnham House. Another of his *hors d'œuvres* was a showy gateway which he designed for Sion House, at Isleworth. We know the usual pattern of the nobleman's gateway; the lodge, the piers, the heavy railings and the rest. His theory was that the passer-by was entitled to such a display for his entertainment, even though it were a little theatrical.

The Adams were great contractors and concerned in many building speculations, such as the familiar Portland Place and the adjoining streets, Fitzroy Square, Finsbury Square, George Street, Westminster, and other streets. As Mr. Papworth, the curator of the Soane Museum, has pointed out to me, the money for some of these ventures was found by that eminent miser, Mr. John Elwes. No one can form an idea of the original appearance of Portland Place; it has been so much altered, storeys having been added to almost every house, the pilasters painted over, the pediments even removed. The interior spacious chambers remain, with their fine chimney-pieces and stucco ornaments. They were disposed in architectural blocks, the central ones being the most marked and most prominent. No. 25, now occupied by Captain Blake, Adam built for himself, and no doubt he made it as attractive as possible. Even as it stands, there is a pleasant correctness and reserve in the treatment.

Fitzroy Square, which I dare say few Londoners have visited, and some do not know, is a picturesque and architectural monument, worthy of Bath itself, which is saying much. The two sides are of stone, garnished with his favourite stucco

friezes, which harmonise admirably. But it is now in a forlorn and dilapidated condition. It was a favourite principle of his to treat a row of houses like this as though it were one long, single building. It has been objected to on æsthetic grounds that this treatment is an architectural fiction or deception, as it is really only a number of houses grouped together. But it may be said that when a whole terrace of houses is thus erected at the same time, it is really one great mansion, for they are under one roof, and each has not its own four walls, but is separated from its neighbour merely by a party wall. It is, in fact, one great house partitioned off into compartments. In Portland Place we find one of his pleasing mansions, Foley House, the back of which has an almost theatrical grace. There is something of the Italian villa here.

Adam also exhibited his talents in theatre-building, always attractive to an architect, and designed the New Drury Lane Theatre for Garrick—a sensible and expressive bit of work conceived in a Classical spirit. The interior showed all the regular and correct Adam ornamentation, and can be recognised at once as his work. It was engraved by Bartolozzi, and the figures on the stage are portraits of the manager and his wife. I believe there are only two instances of his having designed a church, that of Mistley, in Essex—and this is not a very successful work—and that of St. George, in Edinburgh. The ecclesiastical style was, perhaps, not in his way. He also designed tombs, some of which are in Westminster Abbey.

But while thus contributing to the beauty of the street and the country, the architect was even more brilliantly successful in his arrangement of interiors. He wished to offer a complete contrast to the style then prevailing—to the flat ceilings and enormous, ponderous cornices, huge monumental chimney-pieces—which were called tabernacles, all in imitation of the treatment of rooms in palaces. They were dark and gloomy chambers, heavy in treatment, of which we can see specimens in Grosvenor and Portman Squares. Nothing could be more original and imposing than his grand suites of rooms, staircases and lobbies. We may, however, wonder how he got so much out of the limited space. From this nice sense of proportion, they always suggest the idea of grandeur and size. In his mansions he introduced the fine arched, not coved, ceilings profusely decorated, and he would separate a chamber from a lobby by an opening supported by pillars. There were also oval and circular rooms.

Most striking are the original curves of the ceilings, the arched recesses at the side, the pillared vista at the end, the chimney-piece, the urn and the chaste reserve of the frieze in such abundance of decoration. My friend, Mr. Sala, says justly that a lovelier room does not exist than the circular breakfast-room at Lansdowne House.

Such was the house of Lord Derby which was unnecessarily pulled down many years ago, and a modern mansion erected in its stead. But even a greater surprise would be the result if we visited the library of Sion House, the Duke of Northumberland's mansion at Isleworth, when this splendid elaborately decorated apartment would greet us. The luxuriance of the decoration here is quite astonishing. Here, again, we have perfect wealth of decoration, and yet it scarcely seems overcharged. It will be noted that the shelves make part of the construction, being sunk in the wall, which is fitting enough, as the "motive" of the room is books. The shelves or book-cases, therefore, should not be treated as pieces of furniture.

In the decoration of the ceilings Adam displayed an amazing fertility of grace and fancy. It is said, however, that here he was largely indebted to Pergolesi, an Italian he brought from Italy, and who has published his own designs in a handsome volume. But on comparing these I find a greater formality and less freedom than characterise Adam's work. These ceilings were wrought in his favourite stucco, in light relief, and tinted in pale colours. These designs Adam styles "grotesque" in the strict meaning of the word—that is, such as were discovered in the old Roman grottoes. They are of the same type as that used in Raphael's Loggia in the Vatican. This tinting and colouring of the raised work does not seem to me very successful. I have seen in old mansions beautiful designs of this pattern flowing over the wall, half Pompeian, half grotesque. Indeed it is a difficult matter to know how to treat it. I have also seen some rooms elaborately gilt which produced an air of heaviness and emphasised the details too much. In the Soane Museum some thirty or more volumes of Adam's designs are preserved. I suppose there are some thousands of these drawings, some of them beautifully finished, and proving the astonishing power of the architect.

It is difficult to trace the origin of the decorative details in which he showed such a lavish profusion of invention. There is at times something Eastern in the complexity of the patterns. His borders leave a suggestion of the shawl pattern or Turkey carpet. He was fond of the repetition of a spade-shaped motive. Yet, notwithstanding this multiplicity of detail, there is nothing niggling, and breadth and richness of effect is secured without confusion. No one understands better that

canon of decoration which produces the effect of detail by broad touches without the aid of details.

In a striking passage Mr. Ruskin has explained this. He is praising one of Turner's exquisite vignettes in Rogers's "Italy," a little picture only a couple of inches square, representing the Doge's Palace at Venice, and he points out the rich effect of the carvings on the arches; but on using a magnifying glass we find that there is no attempt at representing carvings or details, but that the effect of such is conveyed by a number of artful strokes, dots and the like. This proves that the exact simulation of details does not produce the effect of detail.

Adam kept this principle well in view, and his decorations, when seen at a distance, seem to take more effective shape and do not become confused. The border which runs round the top of the hall of the Society of Arts has this effect.

The favourite garland, which he so regularly employed as a decoration, was not the common realistic imitation, but the refined abstraction of a garland. He sought merely the elegant repetition of the form—the refined form of the garland—the flowing, drooping, and rising of the line which is so pleasing to the eye. Even in his houses of an unpretending class, built for "jobbing" purposes, he did not omit to add his favourite graces and decorations. Thus a narrow hall he would set off by a rather elegant frieze, the details of which wore his favourite bull's head and rosettes, disposed alternately.

Adam had a fine eye for circular and oval forms, and there are refinements in these that would escape less delicate natures. Some of his oval medallions show a most refined feeling. Considering the affinity there is between the Adam style and that of Wedgwood, it is curious that we find no suggestion of any relation between the two men. One would have thought that artists so devoted to beautiful form and contours, in vases and other directions, must have been brought into contact; but I doubt if Wedgwood could have found any legitimate place in Adam's system. Adam was too conscientious to allow his chimneypieces to be mere frameworks for Wedgwood plaques and medallions, which would have diverted the attention from the general effect.

We find, however, from Miss Gerard's recent life of Angelica Kauffmann, that that artist's work, as well as Cipriani's and Zucchi's, were often found in company with Adam's. I doubt if even this co-operation is harmonious; and the delicate tracery and light tints seem to contrast too violently with the dark heavy tones of a centre painted in oils.

In such decorative adornment as ceilings and chimney-pieces and doors, our architect seemed to expend all his graces. An Adam door is a beautifully proportioned thing on which the eye rests with pleasure. They are nearly always double—what the French call *portes à deux battants*—which are always the true proportion. A single door is too broad in proportion to its height, and too great a burden to be balanced on hinges. They were usually of mahogany, with fluted or fluted work instead of mouldings, and of the finest workmanship. A friend of my own was decorating his house at the West-end, when his builder told him of some of these doors, which belonged to an Adam house that had just been demolished. He secured them. I never enter that mansion without being inspired by the sight of them, which have really a dignified and ennobling effect. With arches over them and a graceful entablature, they become most effective ornaments. The balance between height and breadth is perfect.

It will be noted what grace and originality is shown in the treatment of even the door-handles and door-furniture, which are truly elegant. The keyhole and handle are united by a graceful garland.

An Adam chimneypiece is a very choice and *recherché* thing; it finds its way to the dealers' shops, and now fetches high prices. The proprietor building a new house carefully removes the old chimneypieces. They are really exquisite works of art. Adam treated them constructively much as one would a doorway or a window. It forms really an entrance to the fireplace, and as an opening is made in the wall, there must be a construction to support the mass above. Nor did he adopt the false principle of making the top do duty as a broad shelf to carry all manner of articles. The top was merely broad enough to furnish a cornice, hence the effect is quite architectural. They were usually made of the finest statuary marble, and the carving is exquisite. I have seen some specimens in noblemen's houses, with inlaid marbles, lapis-lazuli, and set off by gilt ormolu that were astonishing.

I find in Adam's notes that for one house in Portland Place he made separate designs for every chimneypiece, even for that of the garret, nearly thirty in number. The same originally extended to his fireplaces, the ironwork of which is in perfect harmony with the rest.

I must now hurry on to another department which further displays the genius of these astonishing men. As I have said, they not only built the house, decorated it from top to bottom, but they furnished it entirely. It might be said, indeed, that they were the Maple & Co. of the era, only displaying more careful art than does that popular firm. In the house that I

described in St. James's Square, they supplied designs for everything—chairs, tables, mirrors, girandoles, wine-coolers, tea-caddies, knife-boxes, carpets, hangings, room-papers, all the silver, even to the cruet-stands, and it must be said every one of these articles is distinguished by an elegance of design that is surprising. Their room-papers were charming, both for tint and pattern, and I am glad to say there is a firm in Marylebone, Messrs. Woollams, who have reproduced many of the forms. The silver is designed rather after the Wedgwood-Bentley pattern, vases of classical shape, the work very slightly raised. We know what little design is usually expended on what is called door furniture—handles, plates, keyholes, &c.—yet even the garrets are furnished in this respect with his elegant designs.

Adam furniture is now much esteemed and sought, and is as much admired as sought. It is truly elegant in design and construction, and has much of the lightness, combined with strength, which distinguishes French makers, such as Reisner. His chairs—often graceful, oval designs—were intended as a protest against the broad, sinuous and somewhat coarse lines of the Chippendale chair. The Empire furniture often suggests the Adam in its outlines, and naturally enough, as it came from the same source. Much of Adam's art was in designing his furniture for the room, and even for the place in the room, it was to occupy. Thus his mantelpiece mirror, with the attendant girandoles, made part of the decorations of the fireplace. When he came to combine a mirror with a console table he was equally logical. Nothing can exceed the airy grace of these console tables, with their delicate limbs. He would combine, too, with his table and mirror, tripod candelabra.

His elegant fancy seemed to revel in these fanciful arrangements, and his imagination never seemed to fail him. In his designs for ironwork we find the same sense of propriety and gracefulness. There is a reserve and perfect sense of the capabilities of the material. His railings, balconies and lamps all show this correct and appropriate feeling. The balconies are delicate and geometrical in the details; they scarcely suggest the notion of cast-iron. They can be seen in abundance all over London. He had two or three favourite patterns for his balconies, all simple in design and suitable to the material, and contrasting with the tortuous and florid attempts of our time. He was equally successful in his area railings. Instead of the meagre top rail, pierced with holes, in which the vertical rails were fixed, he used a sort of ribbon with a pattern, which was better for the construction, and more romantically effective. On these railings were reared the standards for lamps and the extinguishers, a picturesque addition to the ornamentation of a house. These were in pure and correct taste, somewhat Greek in pattern.

Another article in which Adam displayed his ingenious variety of fancy was knockers. Though knockers have practically "gone out," we find the Adam knocker retained in many instances, a tribute, no doubt, to their artistic merit. He has many patterns of these, and showed himself conscientious in designing for each separate occasion. In this he resembled that admirable and versatile architect, whose loss we have to lament, Mr. Sedding, whose every effort shows the same spirit of thoughtfulness and fancy. He has a little "trade knocker," as it might be called, in the shape of a lion's head, full of expression. It suggests Stevens's, the sculptor's, little lion on the railing outside the British Museum; a sketch, but so quaint and spirited that artists often come and model it.

Of all the furniture found in modern drawing-rooms, perhaps the least art is expended upon the pianoforte. It pretends to be no more than a ponderous case of machinery. Adam designed a harpsichord, in coloured woods, for no less a personage than the Empress of Russia, and he made a rather elegant thing of it. Our architect even condescended to such things as sedan-chairs, and designed one for Queen Charlotte.

Such, then, is a review of Adam's work—imperfect, no doubt—but prompted by sincere admiration and diligent searchings.

THE STUDY OF IRISH ARCHÆOLOGY.

THE first meeting of the Waterford and South-Eastern Archæological Society was held on Thursday in last week, when the president (the Most Rev. Dr. Sheehan, Bishop of Waterford and Lismore) delivered the following address:—Archæology is properly defined to be the science which deduces the knowledge of past times from their existing remains. The term has, however, a much wider meaning in the title and work of our Society. It embraces for us men and things that have passed away, leaving only memories behind, as well as those which still exist in their ruins. While we have, therefore, nothing to do here with the concerns of to-day or yesterday, for they have their own societies, those which are conversant with contemporary literature, the progress of modern science, the present state of legal and medical knowledge and such like, we, on the other hand, include in our scope everything from the past that may interest or instruct us.

We seek to know what manner of men those who came before us from the beginning in the south-eastern counties were, and what manner of life they led, what they thought and did, what they said and wrote. We seek to trace their descent from Celt or Dane or Norman progenitor as well as their intermarriage one with the other. We push our way into the domain of history too. The archaeologist, in one sense, must precede the historian if history is ever to be written, as men of every civilised land have come to think it should. There was a time, indeed, and that not long since, when the historian thought it unbecoming the dignity of his art to write about anything less important than the large public actions of nations and their rulers. For such their history was little better than the record, more or less skilfully put together, of sieges and battles, of the rise and fall of dynasties, and the births, deaths and marriages of the royal and princely personages who composed them. The student of the past seeks a great deal more to-day, and it is fast becoming freed for him in all other countries.

We must not be behindhand; nor can we forget that this corner of Ireland has its own local history, which the ordinary historian will not describe for us, and could not if he would, and yet for many of us the events recorded there are just as important as most of those which form the staple of what is known as Irish history. Every county, every barony in every county had its own men of light and leading in their day. They are altogether forgotten for the most part, and where they are remembered it is only by their names and one or two leading facts in their lives. It is for the people in each district of the country to revive the memories of such men, where there is anything in them to revive. There are many historic spots and historic buildings; there are, for instance, many places in which battles were fought, not such as decided the fate of the nation, but that transferred power, very great if not altogether supreme within its own sphere, from sept to sept, from family to family, from the native to the stranger, and from the stranger back again to the native. There are graveyards to be found in almost every parish, where the dead of the parish sleep—many who left after them no story; the few who in their day had the making of the country's history. There are the raths and the cromlechs and the ogham stones. Some are still sealed books, others have, in the hands of earnest, skilful investigators, thrown a bright light upon chronology and family history.

But far beyond any of these we have in greater or less abundance in every county two classes of ruins possessing an attractiveness all their own to the lovers of antiquities—old castles and ecclesiastical buildings, such as old churches and monasteries. The number of Irishmen who are so dead to the stirring memories of the past as to go past these unheeded is small indeed, but a love of country, high and holy, has invested them for the Irish antiquarian with an interest that is as delightful as it is absorbing. Every stone in the ivy-clad ruins is dear to him. He examines them with care. He gathers up the fragments wherever he can find them. He cares to know by what Irish chieftain they were raised and what particular purpose they were destined to serve, the sieges through which they passed, the fate which attended them when they came into the hands of the conqueror. The church may be one of those great piles with massive wall and strong-set arch and delicate tracery of window and doorway, like that which stands not far away at Cashel; or perhaps it may be the small rural chapel, like that at Tubria, without any work of beauty upon it or even ordinary skill, as we should regard it, but only bare, decayed walls now, for the weak roof fell in long ago. Grass and weeds are tall and thick on the untrodden floor. High or lowly—it matters not to the true antiquarian—each has its spell for him. More attractive still, because more extensive and beautiful, are the old monasteries. We in Waterford possess, I believe, only two monastic ruins of any importance—one in the city, and another in the county, on the Blackwater, but Wexford and Wicklow have several, and in Tipperary Holy Cross stands almost without a rival in Ireland. The monks who prayed and chanted within those walls and their names are forgotten for centuries. "The loud hosannah no longer rolls" along the arches there, and the bats and the wild birds have built their nests in the sanctuary, but there is no one, no matter who or what he may be, that does not feel himself touched by the genius of the place as he faces the ruined cloisters and wanders over the desolate chapels. In an age when time and money are unsparingly given with the applause of Christian peoples to the preservation of Pagan monuments in countries thousands of miles away, it were certainly not creditable that Irishmen should permit the few traces of past glory that still remain to them to sink into the utter oblivion that now covers the once great monastery and school of Lismore.

There are besides existing remains four different sources from which a knowledge of the past may be derived by our archaeologists—printed books, manuscripts, newspapers and traditions. The number of printed books available for our

purpose is unfortunately very small. The Irish were the last people in Europe, it is said, to use a printing-press. Before the middle of the last century but little attention was paid to the history and antiquities of the country. Of the books published on these subjects before or since that date many have been lost to us. Still a sufficient number must remain to be of material help to the diligent student. Indeed, there are few of us who have not at some time or another heard of a book found in some neglected corner, stowed away in an attic, or lying forgotten on the shelves of a bookcase, that contained information of an interesting, if not important, character about places, persons or events connected with the locality.

If our national literature be poor in printed books it is surpassingly rich in manuscripts. Few persons who have not given special attention to this branch of the subject are, I believe, at all aware of the extent and variety of this manuscript literature. Time and its vicissitudes have dealt hardly with our ancient records. Not to go far back, Keating, when he wrote his History of Ireland in the woods and glens of Tipperary, about the year 1630, had many which have long since disappeared, and the author of the "Annals of the Four Masters," writing about the same date, had a still greater number which have shared a similar fate. Those that remain, however, may be counted by hundreds and probably by thousands. The author of the article on "Ireland" in the recently published edition of "Chambers's Encyclopædia," speaks of a M. de Jubainville who has counted 953 in the libraries of England and Ireland. How many are to be found in the Burgundian Library at Brussels, in the Spanish national archives at Limancas, as well as in the libraries of France, Italy, Germany and Switzerland, we cannot tell, though it is certain there are many. Dr. Douglas Hyde, in a lecture lately delivered in Dublin, stated that the number of existing Irish manuscripts written between the eleventh and seventeenth centuries would fill a thousand octavo volumes. O'Curry does not hesitate to say that the materials for writing the history of Erin are perhaps more abundant than the ancient and contemporary records of any other European country. These older manuscripts embrace every branch of knowledge possessed by the civilised world at the time they were written—the Greek and Roman classics, the writings of the Fathers of the Church, Pagan mythology, history, grammar, poetry, law and medicine. By far the greater part has never been as much as examined. It was so at least when O'Curry wrote his classic work on Irish manuscripts, five-and-thirty years ago. Something has been done since then, not merely by Irishmen, but, strangely enough, a good deal more by foreigners, and especially by German scholars, towards unlocking these treasures.

There are not wanting signs that we are on the eve of witnessing still greater and more successful efforts at home in the same direction. Irishmen are beginning to awake to the thought that they have a literature that is worth preserving, that much more remains to them as their inheritance from the days when Ireland was the "Island of Scholars" than those vague memories which have served to minister to patriotic pride in the rounded oratorical periods and the stirring cadences of the poets. The causes which have tended to turn the attention of capable men amongst us in other directions are fast disappearing, and, what is better than all, an earnest and it would seem a well-considered movement is being organised for the purpose of obtaining a thorough knowledge of Gaelic, without which all efforts, no matter how earnest, well meant and widespread they may be, are clearly foredoomed to failure.

The value of popular tradition for archaeological purposes has been almost altogether overlooked in Ireland. Three or four novelists of the last and second last generations just tapped the source and drew a little for the moment's need and then turned it off, leaving a rich supply behind for those industrious enough to draw it before it comes to be dried up for ever. No one who has enjoyed familiar intercourse with the Irish peasantry, particularly with those of remote districts, can have failed to observe that there exists among them an abounding store of such traditions; nor is that store less varied than abounding. It has preserved to us the tales and stories of our ancestors, the knowledge of their customs and manners, their amusements, their ballads, their songs, their superstitions, and the thousand and one things that go to make up the private and domestic life of a people. No one need be told of the interest that naturally attaches to such subjects; besides, they form a part, and that no mean one, of history, as it is understood, and rightly understood, to-day, and so we find that at this moment every nation in Europe is busy in the preservation of its folk-lore.

I should wish to put in a special plea for the collection of our old Irish airs. I suppose I show myself very much behind the times in expressing a liking for them beyond many others that I know of, but I cannot help having this liking, nor can I help thinking that, no matter what may be said to the contrary, they have for every Irishman a charm that no amount of

popular neglect or fashionable disdain will ever kill. There is not, I believe, a feeling in the Irish nature that they have not power to evoke, not a chord in any Irish heart that they may not touch, not a passion that they may not sway. And this is true not of one class, not of one phase of existence only. It is all the same for the grey-haired old man and the child that sits on his knee, for the student and the farm labourer, for my lady and her maid. In the hall and in the hut, in joy and in sorrow, in success and in failure, to welcome the wanderer home or to mourn the dead, by the banks of the Shannon or the Mississippi, on the Indian hillside or in the cities spread beneath the Southern Cross, it has the same magic power to reach, to hold, to stir.

THE LATE GOURLAY STEELL, R.S.A.

WE regret, says the *Scotsman*, to announce the death of Mr. Gourlay Steell, one of the oldest and best known members of the Royal Scottish Academy, and Her Majesty's animal painter for Scotland. Mr. Steell, who was seventy-five years of age, has of late been a victim to asthma, and for several winters past has had to take the greatest care of himself. During the recent severe weather he had suffered considerably, but was engaged on a picture which he had hoped to finish before the sending-in day for the annual exhibition. It was entitled *Lochaber no More*, and showed a Highland interior with the bagpipes lying on a wooden table, a Scotch terrier on the floor, with a doleful expression, and a small portion of a box-bed in the right corner, suggesting that the occupant would no more play his favourite instrument. The subject is a pathetic one, and is doubly so in the light of what has occurred. The brush dropped from the hand of the painter before the picture was finished, and before the paint was dry the artist had been called away for ever. Mr. Steell had evidently caught cold, and this developing into pneumonia within the last few days, cut him off rather unexpectedly.

Born in 1819 in Edinburgh, and educated there, Mr. Gourlay Steell was the son of John Steell, a well-known wood-carver of his day, some of whose public works still remain to testify to his artistic tastes and skilful hand. Mr. Steell's older brother was the late Sir John Steell, the well-known sculptor, and it was in their father's atelier that both the lads developed their artistic instincts. His early art training Mr. Gourlay Steell received in the school of the Board of Manufactures under Sir William Allan, the first president of the R.S.A., and in the private studio of Robert Scott Lauder, whom so many of the older generation of Scottish artists can claim as master. At the early age of thirteen Mr. Gourlay Steell exhibited in the Royal Scottish Academy Exhibition, then held in a gallery in Waterloo Place, which is now converted into the Edinburgh and Leith Gas Offices, a model of a greyhound. This was in 1832. In 1835 he exhibited a life-size study of a bloodhound, and from that time to this—well on to sixty years—his name has rarely, if indeed at all, been absent from the catalogue of the exhibition. He had from the first a fondness for animals, and it was as their painter and delineator that he was to make his mark. Going over the list of his exhibited works in the Royal Scottish Academy, it is surprising to find how many of them are portraits of horses and dogs, or of Highland cattle in the field or in the byre. Mr. Gourlay Steell was an admirable draughtsman; he had studied the horse and the dog to some purpose, and could draw them with great facility and vitality. He thoroughly understood their nature also, and could hit off their characteristics with singular truthfulness of expression. His excursions into the Highlands brought him into contact with the picturesque Highland cattle; and, as the frequenters of the exhibition on the Mound know, many of these beautiful animals formed frequent subjects for his brush. Some of these pictures were executed with an expressiveness and power which, as early as 1857, led the Edinburgh papers of the time to speak of him as the Scottish Landseer. A picture of Mr. Steell's which attracted much notice in that year was *Llewellyn* and his brave hound *Gelert*, a replica of which was afterwards painted for the Queen; and a few years later he produced his *Highland Raid*, which was also highly spoken of. In it he depicted the Clan Macgregor defending the cattle they had "raided" against a sudden attack of the Royal troops—a subject which he treated with much spirit. The excellent painting of the cattle and sheep was, of course, a feature in the work. It was bought by the Royal Society for the Promotion of the Fine Arts, and was made the first prize in the art drawing of that year. Mr. Steell, who had been elected an associate in 1846, was in 1859 raised to full membership, and he signalled himself that year by producing a picture of prize West Highlanders, and another having for subject the death of *Old Mortality*—one of many pictures suggested by incidents in the *Waverley Novels*. In these early days Mr. Gourlay Steell did a good deal of book illustrations—drawing his pictures on the wood blocks; and for a dozen or more

years—in the forties and fifties—he was the successful teacher of modelling at the Watt Institute in Adam Square—a position in which he succeeded his father. He had a distinct gift for modelling as well as for painting, and from his hands there came many designs in clay of presentation groups of dogs, horses and cattle, which were afterwards executed in silver by Edinburgh silversmiths who had entrusted him with such commissions. Of teaching he was very fond, and many of his students took good positions in the art world.

Early in his career Mr. Gourlay Steell formed a connection with aristocratic patrons, which he maintained until the close of his life. He was constantly requisitioned to paint some favourite dog or pony belonging to members of the nobility or landed proprietors of Scotland, and his commissions often included their children along with some pet animal. He was in this way known in many of the mansion-houses of the land, and was a favourite wherever he went, for he was a man of most agreeable manner, and, like many of his brother-artists, a good conversationalist. He painted two important hunt-pictures which were engraved, viz. an equestrian picture of Colonel Carrick Buchanan of Drumpellier, accompanied by his huntsmen and squires and the favourites of his pack of foxhounds (exhibited in 1872), and a similar picture of the late Earl of Wemyss, which was presented at a dinner at Coldstream in 1863. He also executed equestrian portraits of the Earl of Eglinton and Winton and of Mr. Andrew Gillon of Wallhouse; and a notable picture of his in 1868 was the late Lord President Inglis and a shooting-party at Glencorse. One of his best-known pictures, painted in 1865, was entitled *A Cottage Bedside at Osborne*, and depicted one of those gracious Royal incidents which have made the name of Her Majesty beloved in every cottage in the land. It shows the Queen seated at the bedside of an old fisherman, reading to him the Scriptures. The picture was engraved, and had an immense sale all over the land. In 1872 Mr. Gourlay Steell had the distinguished honour conferred on him of being appointed animal painter to Her Majesty for Scotland, and in pursuance of his office he painted portraits of many favourite animals belonging to the Queen and Prince Consort that are now in the Royal collection. One of his large pictures, *The Pass of Leny—Cattle Going to Falkirk Tryst*, is also owned by Her Majesty. Latterly Mr. Gourlay Steell has been engaged in executing a number of colossal works in oil, tempera—a medium in which he greatly excelled—and in charcoal, chiefly for the decoration of Highland and other mansions. The subjects were of a sporting character—introducing deer, horses, cattle, sheep and wild animals of the chase. Mr. Gourlay Steell's charcoal studies were always good, executed as they were with great freedom and power, and at Lord Tweedmouth's shooting-lodge at Guisachan some very fine decorative works by Mr. Steell were placed a year or two ago. A later work of note was *A Challenge*, exhibited in the Royal Academy (where he had frequently exhibited) and in the R.S.A. Exhibition; and his last model was a Highland bull, now cast in silver, for the late Lord Seafield. For many years Mr. Gourlay Steell held the office of animal painter to the Highland and Agricultural Society. In 1882, in succession to the late Sir William Fettes Douglas, Mr. Gourlay Steell was elected curator of the National Gallery of Scotland, and in that position took great interest in the national collection of pictures under the care of the Board of Manufactures. With the students and others who copy there on Thursdays and Fridays Mr. Gourlay Steell was a great favourite, always ready as he was to give them a word of encouragement, and on occasion, brush in hand, helping them out of some difficulty. He was a man of excellent taste, and in the course of his life had got together a fine collection of armour and antiquities of various kinds, bits of which occasionally appeared in his pictures.

In his earlier years Mr. Gourlay Steell was in the Yeomanry, and all his life was fond of outdoor exercises. He was a good shot and a keen angler, and had many pleasant stories to tell of both pursuits. One of the outstanding features of his life, however, was his enthusiasm for his art. He was a most industrious artist, and was never happier than when he had the pencil or brush in his hand. The amount of work that came from his hand must have been great. In his day few could excel him in the delineation of animals—dog, horse, or shaggy Highland cattle. He did not belong to what used to be called the "Spiritualist School" of animal painters, in which Landseer was included. In his representation of animals he was eminently true to nature. Their varied characteristics were well known to him; he had studied them in all their aspects—their different expressions of countenance he understood, and could depict with unerring fidelity; but he was not given to reading more humanity into the face of horses or dogs, for example, than they actually possess. As a colourist Mr. Gourlay Steell had his faults. Latterly especially, his colour was sometimes wiry and thin, and his tendency to over elaboration of the background and accessories of his works often detracted from their pictorial character. But it would be manifestly unjust to judge of an

artist by his later day work; and in his prime Mr. Gourlay Steel did credit to that particular branch of art to which he was so much devoted. Personally Mr. Gourlay Steel was one of the most likeable of men. Though exceedingly sensitive in many respects, he had a genial and kindly manner, which made him many friends. From his place in the Academy and National Gallery he will be greatly missed.

Mr. Gourlay Steel, who was twice married, is survived by three sons and a daughter. One of his sons is Mr. D. G. Steel, A.R.S.A.

THE FRENCH "ECOLE DES CHARTES."

A CORRESPONDENT of the *Manchester Guardian* who is enjoying the advantages of study in the Ecole des Chartes gives the following account of the institution:—

The teaching of the Ecole des Chartes has a double aim. It is at once scientific and practical. The student is taught the subjects necessary for a first-hand knowledge of Mediæval French history, and is at the same time trained for the work of a librarian or archivist. The school, which possesses a library of its own, is now housed in a building adjoining the national archives. It is under the control of a director and "Conseil de Perfectionnement," chiefly elected by the Academy of Inscriptions and Belles Lettres. The staff consists of eight professors. The course of study extends over three years. Only twenty pupils can be admitted each year, and every candidate for admission has to present the diploma of Bachelier èt Lettres, and in addition pass an entrance examination in Latin and French history, with a foreign language. During his first year the pupil attends courses on palæography, Romance philology, and bibliography and classification of libraries. Before passing into the second year he must pass an examination in the subjects of the first year, and a similar examination has to be gone through at the end of the second and third years. The second year's course consists of diplomatics, history of French institutions, sources of the history of France and classification of archives. The third year's course consists of the history of the civil and canon law, Mediæval archaeology and a continuation of the course on the sources of the history of France. After passing the examination at the end of the third year the pupil must present a thesis on some subject connected with the studies of the school. If it is accepted he receives the diploma of "Archiviste Paléographe."

The lectures, which are open to anyone who likes to attend them, are given in a not over-large room, with a horseshoe-shaped partition surrounding a table in the middle, round which the pupils sit. The general public sit at the tables outside the screen, to which the pupils also often overflow. The general public, or auditors as they are called, take only a passive part in the work of the classes, though they are supplied with facsimiles, &c., in the courses where these are needed. The course on palæography is conducted by M. Léon Gautier, who strives to communicate to his pupils a sixth sense, which he calls the "sens paléographique." He urges them on in the reading of facsimiles by exclamations of "Allons!" "Marchez!" "Courage!" "Bon!" the last sometimes ironical, after the laborious decipherment of some obvious word by a pupil. He is the embodiment of life, energy, enthusiasm and humour, and truly declares that his heart is still young in spite of his sixty odd years. M. Giry, who is about to bring out a large treatise on the subject, is the professor of diplomatics. He comments on the various Mediæval documents, facsimiles of which are in the hands of his hearers, explaining their nature, pointing out the elements which establish their authenticity and validity, and criticising the abstracts of them made by the pupils. The latter extremely valuable exercise trains the future archivist and historian in disentangling the essentials of a document and preparing inventories of the documents under his charge. Other courses worthy of particular notice are those of M. Paul Meyer, the director of the school on Romance philology, and M. de Lasteyrie on Mediæval archaeology. M. Paul Meyer, whose name is held in honour by philologists everywhere, begins his course by a most interesting sketch of the extent and distribution of the Romance tongues, especially French, before proceeding to the study of the dialects and periods of old French. M. de Lasteyrie begins the history of Mediæval architecture by giving a sketch of the art of building in Roman times, and shows how each change in style was brought about by practical needs. Of the other courses, it may be said that their most valuable feature is the imparting of an extensive and systematic bibliographical knowledge. The student who has followed the three years' course ought to be well equipped for the work of his thesis. The theses very often result in extremely valuable work. We may cite as instances that of M. Bémont in 1876, which has since expanded into the best all-round biography of our English hero, Simon de Montfort, and that of M. Langlois in 1885, "Le Gouvernement de Philippe le Hardi," since expanded into the standard monograph

on the reign of that king. The list of distinguished *alumni* of the school includes M. Paul Meyer, the present director of the school; M. Gaston Paris, the distinguished philologist; M. Himly, the Dean of the Faculty of Letters at Paris; M. d'Arbois de Jubainville; M. L. Delisle, the Administrator-General of the National Library; the late MM. Luce, Mas-Latrie, Boutaric and others. Foreigners can become pupils on passing the same examinations as Frenchmen, but they are not included in the order of merit in the examinations, though they receive the diploma after duly passing through the courses and presenting the thesis.

GENERAL.

Mr. E. Burne-Jones has been created a baronet, being the third English painter who enjoys the distinction. A baronetcy was also offered to Mr. G. F. Watts, but was declined.

Christ Church, Sowerby Bridge, was nearly destroyed by fire on Sunday night, when a fireman was killed. The building was erected in 1819.

Professor W. R. Ware having reported on the designs sent in for the library and museum in Milwaukee, which is to cost half a million of dollars, Messrs. Ferry & Clas, of that city have been appointed architects.

Mr. J. B. Wilson, of Glasgow, has been successful in the competition for the new United Presbyterian Church at Clydebank.

The National Gallery of Scotland has been reopened after being closed for nearly a month for its annual cleaning.

The Society of Engineers meet on Monday, the 12th inst., when the president, Mr. G. A. Goodwin, will deliver his inaugural address.

The Kilmarnock Art Exhibition, which was opened on December 21, has just been closed. It is stated that the sales of pictures amount to 904*l.*, and it is expected that they will exceed 1,000*l.* At last exhibition, three years ago, the sales amounted to 1,193*l.*

The Library Committee of the Edinburgh Architectural Association have issued invitations to a meeting to be held on the 15th inst. in the reference-room of the library, the committee being anxious to make the valuable works on architecture and kindred arts as widely known as possible. Sir T. Clark, Bart., will preside, and addresses will be given by the Lord Provost and Mr. Robertson, president of the Association.

Mr. Wm. Morris will give an address to the students of the Birmingham Municipal School of Art on the 21st inst., and distribute the prizes.

An Anonymous Lady Donor has sent 1,000*l.* to Archdeacon Blakeney towards his appeal for 6,000*l.* to put the Church day schools of Sheffield in a thorough state of efficiency.

The French Government have offered three prizes of 3,000 frs., 1,500 frs. and 1,000 frs. for the best designs for a postage-stamp to supersede M. Sace's allegorical composition.

The New Road west of Thirlmere was formally declared open on Saturday to the public by the Lord Mayor of Manchester. The road has been constructed according to the Act of Parliament which sanctioned the waterworks scheme, and at a cost of 29,000*l.* It is five miles and a half long.

Mr. A. J. Bloor is engaged on a history of the American Institute of Architects, for which he is to receive suitable remuneration from the members.

Messrs. Steel & Balfour, of Glasgow, have been appointed architects for the new Congregational church which is to be erected in Govan.

The "Ancient Company of Marblers or Stonecutters inhabiting within the town of Corfe Castle, in the island of Purbeck" held their annual meeting on Tuesday, for "the enrolment of apprentices, the registration of members' marriages and the discussion of questions affecting the company's rights and privileges." For centuries past only members of the company and sons of members duly bound as apprentices have been allowed to quarry stone or marble in Purbeck.

The Trustees of the late Mr. W. B. Barbour, formerly M.P. for Paisley, have agreed to vote 15,000*l.* for the erection of a new infirmary in the town, also 15,000*l.* for a new local grammar school, and to increase to 15,000*l.* the sum already contributed to the United Presbyterian Church.

The Earl of Chichester has given his consent to the Sussex Archaeological Society's request to be allowed to excavate the galleries and chambers recently discovered beneath the castle at Hastings.

The Architect.

THE WEEK.

THE gale on last Sunday night was destructive for buildings. The most important ancient example that suffered was St. Mary's Church, Shrewsbury. The upper part of the steeple, for a length of about 45 feet, fell on the roof of the nave, destroying the timbers and the greater part of the oak ceiling. The Vicar, in appealing for aid towards the cost of restoration, says that the building stands on the site of a previous Saxon church and has a Norman tower, on which a very lofty spire, reaching to a total height of 222 feet, was placed about A.D. 1440. The nave arcade is Early English, and the oak ceiling was of Perpendicular period. The tower and spire had shown signs of weakness, and workmen were engaged in replacing a part of the top of the spire. A heap of ruins 5 feet or 6 feet high can now be seen in the nave. Had the fall occurred an hour earlier about three hundred worshippers might have lost their lives.

LIFTS have become almost a necessity of life in cities and large towns, but owners of buildings in which they are introduced will do well to insure that lifts are made by firms who have gained reputé by such appliances. The mechanism is not quite so simple as is commonly supposed, and a defect in the materials or workmanship may involve expense that is many times in excess of the cost of the most perfect lift. The case which was decided on Tuesday in Mr. Justice CHARLES'S court exemplified the extent of the risk which is daily incurred. The plaintiff was a commercial traveller, who in last March, in company with two friends, called on the occupant of rooms on the fifth floor of a mansion in Oxford Street. In descending the lift stopped working. The attendant and the plaintiff's companions were able to jump on the landing. The load being lightened the lift again rose, and the plaintiff in his endeavour to escape was crushed, and when rescued was found to be in a precarious condition, although happily his injuries were not of a permanent character. The nerve weakness which followed interfered with his business. For the owners of the building it was contended that the injuries were not serious. The jury assessed the damages at 450*l.*, which was not an excessive sum. It is quite evident from the accident that lifts will have to possess an automatic governing power. The attendant in the mansion was without confidence in the machine, and his flight naturally excited the passengers. The effect of three men suddenly jumping from a lift would strain some parts, and the rebound is easily understood. Contingencies of the kind must always be assumed, for one effect of modern education is to make men readily panic-stricken, especially when in the company of a machine, and therefore provision must be made for safety to an extent which in theory appears to be exorbitant.

WE have mentioned that Mr. W. FRANK CALDERON was about to open a school of animal painting. It is now proposed to combine landscape with that subject, and accordingly Mr. C. E. JOHNSON has joined in the direction. The divisions will be treated alternately. There is no studio in London in which the practical training that is contemplated can be obtained, and the new school should therefore offer many advantages for students. The following artists have undertaken to serve as visitors:—Mr. BRITON RIVIÈRE, R.A., Mr. H. W. B. DAVIS, R.A., Mr. ANDREW GOW, R.A., Mr. HEYWOOD HARDY, Mr. S. E. WALLER, Mr. W. Q. ORCHARDSON, R.A., Mr. J. MACWHIRTER, R.A., Mr. COLIN HUNTER, A.R.A., Mr. DAVID MURRAY, A.R.A., Mr. E. A. WATERLOW, A.R.A. The term will commence April 23 and terminate July 14.

AN undertaking on which a Russian gentleman, M. THEODORE SABACHNIKOFF, has decided will do more to distinguish his country than the gaining of a victory over one of the Asiatic tribes. He has arranged for the publication of all the manuscripts by LEONARDO DA VINCI which are considered genuine. It is a most onerous and costly

task, but one that would be worthy of an imperial or royal amateur. The artist, as is well known, would not follow the everyday practice in writing, and his words run from right to left. In many cases he would appear to have used a peculiar code of words. From their novel character the preparation of facsimiles of many of the manuscripts has been all but impossible. By the agency of photography reproductions can be obtained which will be more perfect than the most careful copying. The first volume has been completed, and is the "Codice sul Volo degli Uccelli," an investigation of the principles of flying, with the object of creating machinery for aerial transit, which was one of the artist's dreams. The reproduction is accompanied by translations in modern Italian and French.

THE late Mr. COMBE, who was printer to the University of Oxford, was smitten with pre-Raphaelitism, and bought several examples of the works of the brotherhood. His widow has bequeathed them to the University. Among the pictures are *The Early Missionaries*, dated 1850, *The Afterglow in Egypt*, *London Bridge on the Night of the Marriage of the Prince of Wales*, and *Festival of St. Swithin*, by Mr. HOLMAN HUNT; several early pictures of Sir JOHN MILLAIS, including *The Return of the Dove to the Ark*, &c.; two oil-paintings and a drawing by BONNINGTON, sketches by DAVID COX and W. HUNT, and ROSSETTI'S *Dante's Celebration of Beatrice's Birthday*. A bust of Mr. COMBE, by the late T. WOOLNER, is also given. One of the conditions of the bequest is that the pictures are to be kept together for twenty years after the death of Mrs. COMBE's last surviving executor.

UNDER the title of "Documents Décoratifs Japonais," a new series of examples for students has been produced by the Librairie de l'Art, Paris. The examples have been faithfully reproduced from drawings of flowers, plants, birds, &c., and are useful not only from their suggestiveness, but as examples of facile draughtsmanship. The whole series will be published at a price that is almost nominal, and will be an ornament for the drawing-room as well as an aid in the studio and workshop.

THE Principal of the Technical School, Sheffield, Professor RIPPER, M.I.M.E., delivered an address on "The Testing of Materials," at the meeting of the Sheffield Society of Architects, on Tuesday. He explained the construction and method of using the testing machine, and afterwards conducted a series of experiments of a practical character, and including tests for cast-iron by tension, crushing and breaking a transverse test-bar. Mild steel and wrought-iron were also subjected to the tensile test. Samples of red deal were broken transversely and crushed. The crushing test was also applied to a sample of the ordinary red brick used in the neighbourhood. Lists of the experiments to be shown were distributed to the members; these gave the usual breaking weights of the various materials and spaces in which to record the results of the experiments witnessed. At the close of the address the Professor drew attention to the facilities afforded by the school for the pursuit of many branches of study necessary to the young architect, and expressed his willingness to meet the requirements of the architectural students by arranging for other classes.

AT this week's meeting of the Society of Antiquaries of Scotland, Mr. WALTER J. KAVE described a series of rubbings of memorial brasses from Yorkshire, which were exhibited to the meeting. The series included a full-size figure of a priest in eucharistic vestments from Wensley, date 1360; a figure of a knight from Aldborough of about the same date; figures of THOMAS DE TOPCLIFFE and his wife, at Topcliffe, near Thirsk, date 1391; of Sir JOHN MAULEVERER and his wife, at Allerton Mauleverer, date 1400; of WILLIAM FITZWILLIAM and his wife, at Spotborough, date 1474; an Archdeacon at Sessay, date 1550; and of THOMAS GASCOIGNE, at Burgh Wallis, date 1554. The varying details of costume and armour over the two centuries embraced in the period between the earliest and latest of the brasses exhibited were pointed out, and the total absence of brasses of the type in Scotland gave interest to the exhibition.

THE JARDIN DES PLANTES.

STYLES may come and styles may go, but whichever is fashionable, the Parisian designer remains faithful to flowers. In spite of all that lawgivers for art have laid down about geometric conventionalism being the one salutary principle for all ornament—a doctrine which he sometimes is compelled to respect, in spite of himself—his best work is sure to be heterodox, for it reveals his belief that the purest delight is to be obtained by employing floral subjects courageously. He is, of course, supported by the gratification of his countrymen and countrywomen, whose passion for flowers, and especially the costliest, is well-known; but it may also be said that he owes much to the associations which arise out of the existence of the Jardin des Plantes within the city. If the large area which is occupied by beds of flowers, conservatories, cages, libraries, offices, museums, lecture halls, &c., were sold to speculators for buildings, and if a new botanic garden were established outside Paris, say at St. Cloud or St. Germain, there can be no doubt that a great change would be produced in the industrial ornament of the French. It might be considered an advantageous change by the advocates of conventionalism, and there would be no lack of grace in the examples; but neither designers nor purchasers would be so well satisfied as they are at present. As the Jardin des Plantes is therefore a factor in French art which is not sufficiently appreciated by strangers, some account of its origin may have its use.

The gardens, as our readers are aware, form a sort of outskirt of the Quartier Latin on the left bank of the river. Where they are placed is not a fashionable quarter of Paris, being near the Halle aux Vins, the Salpêtrière Hospital and the Prison of Mazas. The inmates of dreary boarding-houses in the neighbourhood, like the Maison Vauquer, where BALZAC'S PÈRE GORIOT suffered, find the gardens to be a welcome refuge. They are far quieter than the Luxembourg, and a man who is melancholy through misery will not excite attention, for he will resemble the speculators on the Origin of Species and similar problems who there abound. When the first garden was called into existence in the seventeenth century, there was no intention of making it a refuge or introducing zoology, which for many visitors is the most interesting constituent of the institution. At first it was contemplated to create only a garden of medical Herbs, and it was the forerunner of the Apothecaries' Garden in Chelsea. In the seventeenth century there was a necessity for physicians to be herbalists, and HÉROUARD, who dosed LOUIS XIII., therefore proposed that His Majesty should order the formation of a garden in which that knowledge could be obtained. A model for it was to be found in Montpellier, which was established by HENRI IV. The king agreed; it may be he expected remedies for himself would be discovered. The death of HÉROUARD did not delay the realisation of the project. GUY LA BROSSE, his successor, was, if possible, more eager about the garden. Land was purchased in the Faubourg St. Victor, consisting of about twenty-four acres, and in 1640 the royal garden was inaugurated. During the first year LA BROSSE was able to have a space measuring 292 feet by 227 feet planted. In the catalogue which appeared in 1641, there are mentioned 2,360 plants. LA BROSSE died the same year, and was buried in a chapel in the garden. LOUIS XIII. followed in 1643, and the garden was neglected for a time.

It was not until 1652, when FAGON, a nephew of LA BROSSE and the favourite physician of LOUIS XIV., became superintendent, that progress was renewed. FAGON was no less of the enthusiast than his uncle, and travelled throughout France at his own cost in search of plants. He gained the support of COLBERT, who was able to recognise the advantages of the gardens for others besides students of medicine. The Minister may be said to have secured the co-operation of art in the place. GASTON OF Orleans had employed ROBERT, the painter, to execute a series of drawings on vellum of the plants in the garden of Blois. On the death of the duke in 1660 COLBERT not only was able to persuade LOUIS to purchase the collection of drawings, but to appoint ROBERT as artist to the gardens, which office he held until 1684. Many other able artists succeeded during the next two centuries, and hence it is that the collection of drawings of botanical subjects belonging

to the Jardin des Plantes is the most valuable in the world. About 1671, when a vacancy on the direction occurred, COLBERT arranged that the chief control of the gardens should be held by the surintendant des bâtiments, or in other words, by himself, while the first physician to the king should be intendant. A staff of professors was appointed, the most renowned being TOURNEFORT, who taught botany. He was the first who established a rational system of grouping plants. He filled the chair of botany for about thirty years, and students came from all parts to hear him. In 1708 he was crushed by a waggon in one of the narrow streets of Paris, and died from the injuries he received. TOURNEFORT left his herbarium and collections to the gardens. His successor was a failure, for he retired after giving a few lectures. The chair was next filled by JUSSIEU, whose name is familiar to all botanists. One of his assistants was SEBASTIAN VAILLANT, who is supposed to have anticipated many of the discoveries which gained fame for LINNÆUS. He died in 1722. It is not necessary for us to attempt a continuous history of the gardens. The appointment of BUFFON is, however, too important an event to be passed over in the most cursory account of the institution. When, in 1739, he obtained the direction of the gardens in consequence of the dying request of M. DU FAY, the intendant, he was no more known as a naturalist than was CHRISTOPHER WREN as an architect. Both were students of mathematics and physical science, but had not applied their abilities to one class of objects. What WREN did for architecture was equalled by BUFFON'S success in creating interest in natural history. Under his guidance a new era in the history of the Jardin des Plantes was commenced. He employed his remarkable powers of persuasion to obtain the funds required for increasing the collections, and for the erection of buildings in which they could be properly displayed. He arranged for the public exhibition of all the collections. He had avenues planted, and the grounds were laid out in more artistic style. In his dealings with professors and officers he was most generous. In 1749 BUFFON began the publication of his "Histoire Naturelle," which was destined to fill thirty-six large volumes. It cannot be considered scientific in the modern sense of the word, but the remarkable eloquence compelled people to cultivate an interest in the study. The Jardin des Plantes became a fashionable resort, and it was necessary to assign to DAUBENTON, the naturalist, the duty of attending in the galleries in order that he might answer all the inquiries of the visitors concerning the objects in the collections. The reputation of the place was extended, and from many parts of the world presents for the museums were despatched. There was a danger that the original objects of the gardens would be ignored. An anatomical collection was presented by the Academy of Sciences, the King of POLAND despatched a collection of minerals, the Emperor of RUSSIA gave skeletons of rare animals found in the northern regions, and French missionaries in China contributed the most interesting objects they could obtain. In the last century it was impossible for BUFFON to attain a knowledge of the relations between organised beings. His ambition was not unlike the showman's. He was eager to captivate the attention of the public, and knew he would be most successful by presenting things that were novel and strange. At that time much was sacrificed which, in our day, would be considered as invaluable. When collections were obtained, they were sifted, and what appeared to be most surprising was alone exhibited. The remainder was destroyed or left to moulder, for space was limited, and it was not easy to accommodate anything that was not attractive. With all his defects, it cannot be denied that BUFFON succeeded beyond his predecessors in gaining admiration for his charge. A more exact method was not likely to succeed in that age. BUFFON'S name threw a sort of halo over the collections, for it was considered he was the most philosophic as well as the most eloquent of naturalists. When he died, in 1788, the Marquis of BELLARDIÈRE was appointed chief intendant; but, as France was then on the eve of revolution, his tenure of office was brief. The Constituent Assembly was not likely to regard with favour a garden which was designated as royal. An inquiry into the expenditure was ordered, and it was found that the annual expenditure was about 90,000 francs, which was not

a large sum to pay a staff of professors, officers and workmen. It was, therefore, decided that the intendant's salary must be reduced from 12,000 to 8,000 francs, that several offices were to be suppressed and economy to be sought after in all branches.

It required some courage to undertake a responsible office under the authorities of that stormy time, when the slightest error might be made out high treason. The gentle BERNARDIN SAINT PIERRE, the author of "Paul and Virginia" and the "Indian Cottage," was in 1792 thrust into the directorship. That dreamer, who appeared out of place in France and out of time, was soon by accident enabled to transform the character of the garden. Attached to the palace of Versailles was a menagerie, and after the king's execution the animals were in danger of being starved or shot. They were offered to SAINT PIERRE, but he had no dwelling-places for wild beasts. He courageously addressed a letter to the Government, and advised the setting-up of a menagerie. The police had also seized on three travelling menageries, and it was proposed to utilise them for the edification of the public. After a deliberation that was far longer than those which concerned the taking up arms against the rest of Europe, it was decided that living animals as well as skeletons should be seen in the Jardin des Plantes.

In spite of that conclusion, there was more than a possibility of the dispersion of all the collections. Orders were given that institutions for imparting knowledge which was supposed to be obsolete and dangerous to the Republic should be abolished, and the gardens were by some people considered to be as favourable to royalty as the university; but when it was explained that medicines were derived from the beds and hothouses, while the laboratory provided saltpetre, they were spared. By one of those freaks or reactions which were common at that time, the enemies of the gardens suddenly resolved that the collections should be preserved, and that the establishment should be enlarged. A library was to be set up, to which all books on natural history in the public collections were to be transferred, as well as the duplicate copies in the Bibliothèque Nationale. Twelve courses of public lectures were to be given, the subjects being mineralogy, chemistry, applied chemistry, botany, rural botany, agriculture, zoology (two courses), human anatomy, comparative anatomy, iconography. The last subject suggests that the gardens and collections were turned to account by artists as well as students of the sciences. Among the professors selected for the courses we find some who were celebrated, such as FOURCROY, the chemist; LAMARCK, whose doctrines about the variety of beings have the same tendency as DARWIN'S; PORTAL, the author of the "History of Anatomy"; FAUJAS DE SAINT FOND, the earliest investigator of volcanic phenomena; DESFONTAINES, the author of "Flora Atlantica"; LACÉPÈDE, who was entrusted by BUFFON with the continuation of his "History."

On paper the professorial staff and the affairs of the garden appeared most satisfactory; in reality little could be accomplished. For the war every available *sou* had to be secured, and there was no money to pay salaries or to purchase plants. Precious collections were sent to the gardens, but as the buildings were not dry they could not be removed from the cases. The unfortunate animals were kept on short commons, and some became very ferocious. The professors and officers appealed for aid to keep up the gardens, but the Government were without funds. The financial difficulties were so pressing that an order had to be given authorising the destruction of some animals to provide food for the others.

The attainment of supreme power by BONAPARTE was again for the gardens. CHAPTAL, who was appointed Minister of the Interior in 1800, had been a professor of "chimie végétale" at the Polytechnic School, as well as director of the powder factory at Grenelle. He was competent to realise the utility of the gardens and collections, and endeavoured to improve them. LUCIEN BONAPARTE, when Minister, had decided on the appointment of a controller of the place, who would have the sole responsibility and privilege of corresponding with the Government. The professors, on the other hand, considered that every department must have a responsible director, as it was impossible for one man to understand all

that the collections represented. CHAPTAL adopted the professors' views. He approved also of FOURCROY'S proposal, that illustrated memoirs should be issued regularly, recording the results of the investigations which were conducted in the gardens, an enterprise which was cordially welcomed by lovers of science everywhere. The additions to the collections were valuable. For the collection of minerals formed by WEISS 150,000 francs were paid, a large sum in those days. Foreign States were eager to show their appreciation of BONAPARTE by sending presents to the gardens. Exploring expeditions were sent to distant places to collect specimens. ALEXANDER HUMBOLDT at one time gave plants of 5,600 species, which he had derived from South America. The CUVIERS increased the importance of the collection by explaining the difference between fossil remains and living animals and plants. As long as the Emperor held dominion, the Jardin des Plantes flourished, and by spoliation as well as by purchases and presents the collections surpassed all others. But as NAPOLEON'S power waned the gardens proportionately suffered. The money assigned to conservation and extension was diminished, and owing to the demand for conscripts the students were much reduced in number. On the entry of the Allies in 1814 the gardens were assigned to the Prussian troops, and it must be recorded that not the least injury to any object was inflicted. In the following year, when Paris was again in their power, it was apprehended that the collections must be dispersed, for the spoils taken from foreign museums were reclaimed. It was, however, admitted that natural science was more likely to be served by leaving the collections complete, and the diplomatists and savants agreed to a compromise. As a rule only historic objects, such as precious stones which were taken from the Vatican, and objects which were the property of private individuals, were returned. The Emperor of AUSTRIA, after examining the gardens, sent plants which were needed from his own garden, and he found several imitators. On the whole, the establishment did not suffer by the downfall of the Empire. The gardens were visited by Sir WALTER SCOTT at that period, and he gives an interesting account of them in his Letters, which is applicable to-day. In one he writes:—

I know that nothing in Paris would delight you more than the Jardin des Plantes. This grand botanical garden, of several acres extent, richly stocked with the most varied and curious productions of the vegetable world, is equally interesting to the scientific student and to the idler, who seeks only for shaded walks and interesting and beautiful points of view. The variety of the ground, the disposition of the trees, and the neighbourhood of the Seine, afford the last in considerable variety; while the shade, so grateful in this warm climate, is secured by many a long alley and avenue. The establishment is maintained entirely at the expense of the public. The learned in physics may here have the advantage of a chemical laboratory, of lectures upon botany and natural history by men of approved science, of an anatomical collection and valuable library, composed of works relative to natural history. There is also a menagerie upon a great scale of splendour, as well as of comfort to the animals with which it is tenanted.

The succeeding Governments of France were compelled to keep the establishments on the level that was attained under the Empire. In 1830 we read of a vote of 90,000*l.* to construct new galleries for mineralogy, geology and botany. Land for extensions was also acquired from time to time, additional professorships and studentships were founded, and the aim was to make the collections become illustrative of the advances in science.

At the present time the Jardin des Plantes may still be considered unrivalled as a museum of natural history. For students of botany it is invaluable. The gardens are wisely laid out to suit the needs of students, and on that account strangers are sometimes disappointed, because parts are not picturesque. It is in the museums, however, that the botanical wealth is most apparent. There are innumerable preserved specimens of the flora of all parts of the world. Some are arranged to exhibit the vegetation of different countries, and may be said to have a geographical basis. Others exemplify the theories of famous botanists, and thus possess historical interest. All of them reveal the variety which nature presents, and they exercise so much fascination, we need not wonder that French designers so constantly seek inspiration in the galleries of the Jardin des Plantes.

THE ROYAL SCHOOL OF ART NEEDLEWORK.

ON Wednesday H.R.H. Princess Christian presided at a meeting at the Imperial Institute in support of the Royal School of Art Needlework. The Princess briefly explained the scope of the scheme, and invited Mrs. Dunlop Hopkins to give the meeting an account of a similar school which she successfully founded two years ago in New York City.

Mrs. Hopkins stated that the New York school had already attained three objects. In the first place it offered remunerative employment to women; secondly, it supplied manufacturers with trade designs; and in the third place it was self-supporting. She collected 2,000*l.* to found the school, but the experiment was so successful from the first that she was able to return three-fourths of this sum to the subscribers. There was a balance in hand at the end of the first year's working, and that balance had since been increased. The fee was 10*l.* a year, and there were now 300 students receiving instruction. Work completed in the school had been sent to three exhibitions, and at the World's Fair the students received five gold medals and four diplomas. She described the course of study pursued, dwelling particularly on the importance of that in historic ornament, to which in America students devoted two years or more. At South Kensington there was a similar course, but it was not carried far enough. The instructors of the New York school were the paid designers of the great manufacturers of the city, men who were actually engaged in the factories, and what was wanted in England was a practical ornamental school of design taught by similar instructors.

Thanks were afterwards tendered to Princess Christian and Mrs. Hopkins.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. Macvicar Anderson, president, in the chair.

The PRESIDENT announced that the Council had nominated Sir Frederick Leighton as recipient of the Royal Gold Medal.

The PRESIDENT moved that sanction should be given to the Council to lodge a petition against the Bill the County Council proposed to promote in Parliament in regard to London streets and buildings. He said the Council did not intend to oppose the Bill, but they wished to have a *locus standi*, so as to appear before any select or other committee in Parliament to oppose some details of the Bill which they considered objectionable, and therefore could not agree to.

Mr. TAVERNOR PERRY asked the President if his motion required seconding.

The PRESIDENT said Mr. Perry could second the motion if he liked.

Mr. TAVERNOR PERRY said he would then move that the matter be referred to a special or other meeting of the general body of the Institute, in order to give the Fellows an opportunity of considering the matter and instructing their delegates as to action to be taken before the select committee.

Professor KERR next rose, but the President intervened, saying that the business of the evening was somewhat long, and asked the members to pass his motion.

Mr. WOODTHORPE spoke in support of Mr. Perry's motion, and referred to a report of the Standing Committee, published in the "Journal," which showed that the committee had quite misunderstood the matter.

Mr. FOWLER followed with some remarks.

The PRESIDENT said the matter might be left in the hands of the Council.

Mr. PAYNE said the Fellows of the Institute would evidently have no voice in the matter if the President had his wish.

Other speakers followed.

Professor KERR then said he would second the motion of the President, and the motion was put and carried.

Professor KERR then called attention to the motion of Mr. Perry, which, as he had previously tried to explain, was not to be considered an amendment, but a motion.

The motion of Mr. Tavernor Perry, to the effect that a meeting of the Institute should be convened to discuss the Bill, having been duly seconded, was put by the President to the meeting and carried.

Mosaics and Frescoes.

Mr. HARRISON TOWNSEND read a short paper. He alluded to the high position that England held in regard to decorative and art productions, our reputation for such being acknowledged by other countries. Principles were studied, and craftsmen had loyally carried out the conditions of their art. They had not depended on sensational effects, but had worked under necessary limitations, applying the principles of their art with conscience. Mosaic was used for construction of decorative design by aid of small cubes or tesserae. Mr. Townsend then described different processes and compositions employed

for bedding the tesserae, also the methods of execution of mosaic work, and among these alluded to a not uncommon method of gumming the tesserae upside down on to paper, and then reversing them set in pozzolana cement. Gold tints and colouring he described, saying that a multitude of tints should not be worked from; a box of thirty tints was quite enough. Working in mosaic certain conditions were imposed on the artist, which he alluded to. Joints, for instance, should play their part in the design. Aerial and atmospheric effects were to be avoided. The work should not be smoothed down to one dead level. Impressionism, he also said, was what should be aimed at. He described a treatment in monochrome he said he had carried out in a church, his method of obtaining a certain amount of flat surface for ceiling-decoration, for production of life-sized figures, and the method of execution; the preparation of the plaster-work, rough-rendered plaster serving as the basis, and also the uses of various chemical washes, and fixing solutions which atmospheric conditions or acids could not affect.

Mr. POWELL confined himself to wall and roof decoration in glass mosaic, as he did not propose to speak of floor work or of marble mosaic. He described different materials used for glass mosaic and methods of colouring and chemicals and metals used for producing different colours, processes for glass enamel, and the conditions when plain or fractured-surfaced tesserae should be employed. He mentioned the processes for making the gold tesserae, silver being made in a similar manner. Examples of gold work so made he traced back to the fourth century. Earlier work of the third century found in the catacombs showed that the Romans employed gold in mosaic work. He alluded to different methods of working for curved surfaces and the preparation of models for it, in contradistinction to working on the flat. He several times referred to the mosaic work carried out in St. Paul's Cathedral. He also favoured the plan of working *in situ* rather than executing the work in the studio. Time was saved by the former plan, and the dead level appearance of the second plan avoided. He concluded by some suggestions which he considered required attention if mosaic work were to flourish in this country, and among these suggestions an important one was to design according to the distance the work would have to be viewed by the eye.

A paper by Mr. Salviati was read by the manager to the firm. He said mosaics might be divided into two classes, mosaic work for marqueterie, brooches, table-tops, &c., and the monumental or Byzantine kind, best fitted for architectural decoration. A short review of the rise and development of mosaic was made, the successive steps towards improvement described, and the materials and processes for making enamels mentioned. The author of the paper also alluded to his father's, Dr. Salviati's work, and his efforts to establish schools of training for workers; also to Dr. Salviati's systems of work, methods which he pronounced as most simple and least costly, the process of manufacture being also so quick. The paper concluded by calling attention to the excellent condition of the mosaic work on the Albert Memorial.

Mr. Westlake's paper was read by Mr. Carøe. Mr. Westlake proposed the following questions:—Whether mosaic and fresco works could be revived here; if they could, would they be suitable here; and thirdly, whether our modern methods would not be the best, especially in regard to climate. The modern mosaic work in Russia and France was alluded to, and mosaic work and fresco work considered from the æsthetic point of view. There was no real school of fresco here, neither did he think there was here anything that could be called patronage of it. He was inclined himself to favour the modern methods as regarded mosaic and fresco work.

A vote of thanks was passed by acclamation to the authors and readers of the papers.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the meeting of this Association, Mr. W. W. Robertson, president, in the chair, Mr. J. M. Gray, F.S.A. Scot., curator of the Scottish National Portrait Gallery, read a paper on "Engraving on Metal: its Technical Processes and Artistic Results." After remarking upon the pleasure to be derived from a study of the *technique* of the various processes of art, from a perception of the adaptation of the artist's method to the object which he had in view, the lecturer considered in detail the various processes of engraving on metal and the artistic results which they yielded. The method of line-engraving Mr. Gray styled as *par excellence* the classic mode of engraving, and stated that its highest function lay in translating into black and white by the most careful, finished and accomplished method, the great masterpieces of the painter's art. It was noticed that the early line-engravers were original artists who reproduced their own designs, and special reference was made to the plates engraved by Martin Schongauer, Van Mechlin, Albert Dürer and Lucas van Leyden. In Marc

Antonio they had, however, an early engraver who devoted himself to reproducing another artist's work—the designs, namely, of Raphael. The line-engravers of France and Holland of the seventeenth and eighteenth centuries, and the great school of English line-engravers who reproduced the landscapes of Turner were dealt with, and the technical processes of etching were explained. Etching, he said, was pre-eminently a process for sketches in which the line should be used with the finest selection and be as expressive as possible. Rembrandt was instanced as the great master-etcher, and reference was made to the modern revival of etching as an artistic process in France and England, and to the work of such etchers as Meryon, Flameng, Whistler and Haden. The lecturer stated that the most typical dry point was one rendering vivid and telling contrasts of light and shade, his remarks being illustrated by a reference to plates by Legros, Geddes and Wilkie. Mezzotint was the last method with which the lecturer dealt, a process fitted for realising perfect tonality, and as it worked by spaces, not lines, for rendering the breadth of effect that is attained by the painter's brush. Reference was made to the magnificent renderings of Reynolds's portraits by this process, and to its use by Turner and Constable in reproducing their landscapes.

THE PHŒNICIAN RELICS AT THE BRITISH MUSEUM.

A REARRANGEMENT of great importance has just been made in the British Museum of the valuable historical monuments of the ancient Phœnician peoples which that institution possesses. The second Northern Gallery, which has the inestimable advantage of good overhead lighting, has been devoted to their display, says the *Standard*, and will be a treasure-house for popular instruction when the addition of a concise descriptive guide-book has been published.

In the wall cases on the landing of the north-west staircase before entering this gallery are a considerable series of sculptures and inscriptions, chiefly from excavations at Idalion, in Cyprus, in 1870, by the British consul, Mr. R. Hamilton Lang. The order of their arrangement is on a chronological basis, and they illustrate the Archaic and Hellenistic periods of Cyprian art from about 650 B.C. to 150 B.C. Amongst the most interesting of these objects are numerous heads of the Tyrian Hercules; a marble slab with bilingual Phœnician and Cyprian inscriptions made by Baalramus, son of Ebed-Melek, in honour of the god Resel-Mikal; a group of figures for a tomb, and a limestone stele with bilingual inscriptions, in Greek and Phœnician, of Artemidorus of Sidon. The first room is devoted to Cyprian antiquities, mainly of small sculptures and terra-cottas, showing the effects of Egyptian, Assyrian and Greek influences upon Egyptian art. There are also bilingual Cyprian and Phœnician inscriptions of historical and philological importance, some belonging to the Archaic period and others to the Hellenistic. In the centre of the room is an alabaster monument, from Larnaca, of Sardalus, son of Ebed-Melkarth, grandson of Resefyathan, in honour of his god Eshmun, about 380 B.C.

The second room contains monuments from Phœnicia, or ancient Canaan—the lowland of Palestine—Carthage and Cyprus, as well as from Palmyra and Arabia. The land occupied in very early times by the Phœnicians or Canaanites extended from Lebanon on the north to the Dead Sea on the south, from the river Jordan on the east to the Mediterranean on the west. These ancient inhabitants were probably immigrants, Strabo thinks, from the islands of the Persian Gulf. As early as the time of Abraham there was a settlement on the plain at the foot of the mountains of Lebanon. Herodotus says that the Temple of Hercules, in Tyre, had existed for twenty-three centuries. About 1300 B.C. the Israelites, led by Joshua, invaded the country, and driving the inhabitants from the interior, restricted their occupation to the narrow tracts of coast between Aradus and Askalon. This position, however, gave them the command of the Eastern Mediterranean Sea, and they thus maintained their vast trade with the ancient world. Their chief cities were Tyre and Sidon, both settlements of high antiquity. Their “new city,” Carthage, dates from very many centuries before Christ. In all parts of the earth traces of the Phœnicians remain. Their language is closely allied to the Hebrew, and it has given birth to the Greek and Latin, and eventually the modern European languages. The oldest Phœnician inscription known is that of Mesha, King of Moab, 900 B.C. Amongst the chief objects in this second room is a cast of the Phœnician inscription on the celebrated Moabite Stone, presented by the Museum of the Louvre. This stone was discovered by the Rev. F. Klein, at Dibhan, in August 1868. It is 3 feet 10 inches high, 2 feet in breadth and 14½ inches in thickness. It will be remembered that the Arabs resented its removal, and, after vainly attempting to smash it with hammers, heated it by fire and splintered it into fragments by pouring vinegar on the hot mass. The restoration has been effected through a paper cast previously taken—28 of the frag-

ments of the original having been secured. The inscription consists of 44 lines. Its date is 900 B.C., and it gives account of the war of Mesha, King of Moab, against Omri-Ahab and other kings of Israel. The Moabites were surprised by the Jewish league, and mercilessly routed from city to city until Kir-hareseth. Here, with 700 men who drew swords, King Mesha made a vigorous onslaught upon the King of Edom, but was repulsed. After this he publicly sacrificed his eldest son upon the city wall, in view of the invaders. His troops fighting with fresh courage drove back the victorious armies of the allied Israelite kings. Mesha restored Korchah and its gates, towers, palace, reservoirs, and rebuilt other places, and made a road over the river Arnon. He set up this monument at Kermost; and it is very instructive to compare this inscribed narrative with various passages in the Jewish Book of Kings.

Another monument of interest is the inscription which was cut from the wall of the conduit which filled the Pool of Siloam. It states that the excavators met in the middle of the tunnel, and at 3 cubits apart they worked towards each other by the sound of their picks. The water flowed through from a spring 1,200 cubits away. In the inscription of the sarcophagus of Eshmun-Azar, King of Sidon, B.C. 350, he complains of dying before his time, and forbids men to search his tomb for treasure, for there is none; or to remove his tomb; or to build anything over it. The inscription further states that he, the son of Tabnith, King of Sidon, and Queen Ammestoreth, his mother, the priestess of Ashtoreth, built the Temple of Ashtoreth and Astarte in Sidon, the Temple of Eshmun, the Sacred Grove of Enfidal in the mountain, the Temple of Baal at Sidon, and that of Astarte-Shem-Baal. He, the Lord of Kings, bought at great price the most excellent land of Dir and Joppa, in the territory of Shatan, and joined it to the borders of Sidon for ever. Amongst the other relics of note are the inscription from the Temple of Juno at Carthage; casts of Hebrew square characters from the so-called “Tomb of St. James,” in the Valley of Jehoshaphat; busts from Palmyra—the ancient Todmor built by King Solomon. There is an important series of tombstones, and on the centre tables of the room are seals, scarabs, and other articles engraved with Phœnician devices and inscriptions—many probably the work of engravers settled in Egypt—the period of work extending from 700 to 100 B.C.

GLOUCESTER CATHEDRAL.

TWO years ago, in response to an appeal by the Dean and Chapter, the sum of 6,000*l.* was subscribed for the restoration of the fabric of Gloucester Cathedral. With this money the Norman turret of the south transept has been repaired; the bells have been readjusted and rehung, repaired and strengthened; the south ambulatory of the choir has been repaired as regards roofs, walls, parapets and windows; the north ambulatory is nearly finished; two of the large south windows of the lady chapel have been repaired and reglazed, and other windows restored; the parapets and pinnacles are completed and the roof strengthened. The famous chimes have been renewed and the quaint tunes properly set. A special appeal is now made for the necessary restoration of the lady chapel, and a sum of 650*l.* is already forthcoming. The Dean and Chapter urge that the work of restoration in connection with the lady chapel should be proceeded with as quickly as possible, especially the external parts and the glazing of the windows. The structure has fallen into a shocking state of decay. At present the wet gets in everywhere. The sum of 4,150*l.* is named in the architect's report for the necessary works. It is hoped that the lady chapel may be so repaired and fitted up that it may be used for Divine service, it having been disused for over forty years.

ROMAN ROCHESTER.

DURING the excavations carried out in connection with the rebuilding of Sir Joseph Williamson's Mathematical School at Rochester an interesting archaeological discovery was made. It was found that the Saxon work of the old city wall and Eastgate Tower rested on Roman foundations, and during the progress of the operations Roman remains were opened up to a considerable extent. The Rochester Town Council have now taken steps to preserve for public inspection these interesting works of the Roman and Saxon periods of the history of their ancient city. A strong desire was manifested to continue the investigations and to further open up Roman Rochester, but the Corporation came to the conclusion that they could not fairly and legitimately devote the money of the ratepayers to this purpose. Therefore, whilst they are doing all that is necessary to maintain access to the Eastgate Tower and the other ancient relics, the Corporation have decided to leave any future researches to antiquarian and kindred societies.

TESSERÆ.**Gerrard's Hall, London.**

IT has been too much and too long the custom to view the manners and habits of remote times through a medium highly tinged with the results and conveniences of modern life, and therefore they have been seen under a false aspect: it is only by looking carefully into the dry schedules of the household effects of our remote ancestors, and taking the number of their pots and pans, their beds and tables and other domestic goods, that we can be enabled to judge how meanly they were lodged and how far from luxurious their daily modes of life must necessarily have been. Thus we see in London, as in other towns that are old, the lower storey of the house was usually half underground and almost invariably vaulted over, and this when the superstructure was of wood. It was, indeed, the most common arrangement to have the lower storey only of stone and vaulted, and the upper part of wood. These lower apartments served as store-rooms or warehouses for valuable goods, or for cellars only, according to circumstances. In the decayed town of Winchelsea many of these vaulted chambers remain perfect, although the timber houses which were originally built upon them have entirely disappeared, or have been rebuilt. There are many traces of these vaulted chambers also in London. The fine room in the building, commonly known by the name of Gerrard's Hall, was, in fact, a merchant's warehouse of this kind, and not strictly speaking a hall; that is to say, it was never the hall or living room of the house. It had no fireplace in it and no place for a hearth in the centre, and the manner in which the original staircase descended into it clearly showed that it was always half underground. It was an excellent example of the lower storey of a large merchant's house of this period, but the hall was over this and was apparently of timber, with the gable ends only of stone; these were partly standing in May, 1852. The room called the hall would more properly have been called the cellar, and though a fine room for that purpose, scarcely finer than the cellar of the bishop's palace at Norwich, and other examples, both English and French. It was evidently the lower storey or cellar of the house of a wealthy merchant of the time of Edward I. It was an oblong room vaulted in two parallel divisions, with a range of arches between them, carried on rather slender round pillars, with moulded capitals and bases of early decorated work. The shell of the vault was of small ashlar-work of hard chalk, with ribs on the groins and longitudinal; the ribs had hollow chamfers but no bosses. Its dimensions were 42 feet long by 21 feet wide. The entrance was by a flight of stone steps in one corner, carried upon a half-arch, part of the original work. At the opposite end of the hall was a small doorway opening into a passage in the thickness of the wall, in which there had been a staircase.

The Chandos Portrait of Shakespeare.

This picture has for many years been known as "The Chandos Portrait of Shakespeare." It came into possession of the family of the Duke of Buckingham from Mr. Nicholl, of Minchenden House, Southgate, whose daughter married the Duke of Chandos, who was father of Anna Eliza, Duchess of Buckingham. It is presumed to have been the work of Richard Burbadge, the actor, who originally represented most of the great tragic parts in Shakespeare's plays. Burbadge is known to have had considerable skill in painting, and left behind him, amongst other pictures, his own portrait—still preserved at Dulwich College. Those who compare the Chandos portrait of Shakespeare with the Dulwich portrait of Burbadge will not fail to remark proofs of similarity of style and treatment. Joseph Taylor, the actor, who outlived Burbadge many years, is stated to have been the next owner of the picture, and it has been added that "he left it by will to Sir William Davenant"; but as no will by Taylor has been discovered, and as he was very poor in the later period of his life, it seems much more probable that Davenant obtained it by purchase. There is no doubt that the picture once belonged to Davenant, who, having been born in 1605, died in 1668. If he never saw Shakespeare himself, he knew many who had lived in the greatest familiarity with him, and who must have been acquainted with every feature of his face and with every turn of his expression. It is quite certain also that Sir Godfrey Kneller made a copy of the portrait and gave it to Dryden, for Dryden states it in the verses he sent to the painter in return for the present. Dryden was thirty-seven years old when Davenant died, and must often have heard him speak of Shakespeare and of this portrait. Thomas Betterton, who may be called the last performer of the school of Shakespeare, is said to have bought the picture at Davenant's death; it was therefore Betterton's property when Kneller copied it for Dryden, because Kneller did not visit England until 1674. Davenant would not have prized it, Betterton bought it and Kneller copied it, if the resemblance to Shakespeare had not been accurate. Its resemblance to the engraving on the title-page of the first folio, which must have been selected by Heminge and Condell on

account of the likeness, to which Ben Jonson bears direct testimony, is apparent. The only material differences are the earring, which was not inserted, and the dress, which in Martin Droeshout's engraving is more ornamental and elaborate. The copy made by Kneller for Dryden devolved into the hands of the Earl of Fitzwilliam; and such was the estimation in which the original was held at later periods, that a painting was made from it by Sir Joshua Reynolds for Bishop Newton in 1760. An anonymous copy was presented by Capell to Trinity College, Cambridge, in 1798; and Malone engaged Ozias Humphry to make a drawing of it in crayons in 1783, which is now in the collection of the Garrick Club. Ramberg and several artists employed by engravers also imitated it, but generally with little skill and less fidelity; the enamel by the elder Bone is, however, a beautiful specimen of art. The original passed from Betterton to Mrs. Barry, the famous actress. She sold it to Mr. Robert Keck, of the Temple, for forty guineas, and from him it came to Mr. Nicholl. It afterwards went, as already stated, to Stowe, and at the sale of the Duke of Buckingham's effects in September 1848, it was bought by the Earl of Ellesmere for 355 guineas. Lord Chancellor Ellesmere was acquainted with Shakespeare, and, by an appropriate coincidence, a possessor of the title became the possessor of the portrait. It is painted on canvas and is 22 inches high by 17 inches wide.

Types in Painting and Sculpture.

The qualities which constitute the elements of the formative arts may be reduced to form, colour and light as exhibited in the organic and inorganic world. Of these, form may be said to comprehend the most definite and universally applicable principles, and therefore claims our attention first. The definition of any given fact in the outward world in its relation to the sense of sight is arrived at when that assemblage of qualities which constitutes its distinctness from all other facts is made intelligible. The definition of visible characteristics with this view is accomplished in a great degree by the comparative anatomist, the botanist, and other votaries of science. Such investigators may consequently render more or less service to the artist. But the paths of the two classes of inquirers soon diverge. To the painter such researches are not an end, but a means. On the one hand, his attention is invited by the infinite variety of nature no less than by her order and method, and on the other, his selection of distinguishing facts has a wider application than the mere purpose of recognition or the mere fidelity of representation. He regards the prominent characteristics of objects not as isolated details, but rather in the arrangements and relations. When, therefore, we here speak of characteristic qualities in reference to the productions of nature it is always to be understood that the term comprehends the idea of a whole, and that the prominent qualities are supposed to be considered in their relation to the general appearance. This mode of observation may indeed be considered common to the zoologist and to the artist, but the latter in one sense goes further. What may be called the representation or archetypal form in animals is arrived at not merely by comparing individuals of the same species together, but by comparing them with other creatures, which decidedly but not radically differ from them. There can be little doubt that this was the principle which enabled the Greeks so constantly to arrest the great characteristics of human beauty. Their process in this respect is more especially evident in their representations of what were called divinities. Making every allowance for the powers of gifted artists and the excellence of models, the supernatural yet beautiful treatment of the human form, which some of the finest antique statues present, is only to be explained on the principle above noticed. That form, as the most complete development of its class, can only be so elevated by departing (as far as the verge of possible, or rather conceivable, nature warrants) from the characteristics of inferior animals. It can be so elevated with perfect success, because it is the only instance in which an animal may slightly overpass its own characteristics without encroaching on or too closely resembling those of another.

Roubiliac's Agreements.

The following copy of an agreement is evidence of the care taken by the French sculptor—whose thoughts were said to be conceits and his compositions epigrams—to avoid misunderstandings between himself and his clients in England:—An agreement made the 18th day of April, in the year of our Lord one thousand seven hundred and fifty-nine, between Louis Francis Roubiliac, of St. Martin's Lane, in the parish of St. Martin-in-the-Fields, in the county of Middlesex, statuary, of the one part, and Ann Lynn, of Southwick, in the county of Northampton, widow, of the other part, as follows:—That is to say, that the said Louis Francis Roubiliac, in consideration of the sum of two hundred pounds of good and lawful money of Great Britain to him the said Louis Francis Roubiliac in hand paid at or before the sealing and delivery hereof by the said Ann Lynn, and the receipt whereof is hereby acknowledged

and of the further sum of three hundred pounds of like lawful money to be paid to the said Louis Francis Roubiliac, his executors or administrators, by the said Ann Lynn, her executors or administrators, when the monument hereafter mentioned shall be completed, doth hereby for himself, his executors and administrators, covenant and agree to and with the said Ann Lynn, her executors and administrators, that he the said Louis Francis Roubiliac shall and will make, erect, and set up in and upon the ground purchased by the said Ann Lynn in the parish church of Southwick aforesaid for that purpose a marble monument to the memory of George Lynn, the breadth whereof to be at least seven feet and the height thereof to be at least fourteen feet, and complete the same in a good and workmanlike manner according to a plan drawn thereof, agreed to and signed by the said Louis Francis Roubiliac and the said Ann Lynn: the choice of the colours and quality of the marble for erecting the said monument to be left to the discretion of the said Louis Francis Roubiliac. And the said Ann Lynn for herself, her executors and administrators, in consideration of the above agreement, to be performed by the said Louis Francis Roubiliac, his executors or administrators, doth hereby agree to pay or cause to be paid unto the said Louis Francis Roubiliac, his executors or administrators, the said further sum of three hundred pounds when the said monument shall be so erected and completed according to the said plan thereof. And further, that it is mutually agreed upon by and between the said parties that the said Ann Lynn, her executors and administrators, shall not be liable to pay or be at any further expense above the said sum of five hundred pounds for or on account of engraving or cutting the inscription upon the said monument, packing-cases, carriage of the same, putting up, and iron rails round the said monument, parish fees, and anything done to the foundation where the said monument is to be erected—mending or alterations in the church wall on account of erecting the said monument excepted.—In witness whereof the said parties have hereunto interchangeably set their hands and seals the day and year first above written.

Myths and Greek Art.

A general history of mythic tradition can only result from the separate investigation of the individual myths—it is the sum of these biographies. Many of them we cannot trace to any intelligible origin. The cumbrous learning of the last century failed to prove their derivation from exotic or from esoteric sources—the ingenious sagacity of German criticism will scarcely divine how and when they were first engendered. Each myth is a separate thread—the whole system an intricate network. We cannot subject it to a strict anatomy, lay bare its tissues and trace each fibre to its insertion, but it is possible to learn something of the organic laws as well as of the external circumstances which have influenced its growth. It is possible to compare the popularity of myths by noting the relative frequency of their recurrence in art and literature; to arrange their varieties locally, and in many cases chronologically, and to note the successive predominance of special influences in causing these varieties. With what success such a method of inquiry can be applied to mythology has been shown in the masterly dissertation in Grote's "History of Greece," how it can be further carried out in mythography it is the province of the archæologist to show. His part in the division of labour is to arrange the monuments of Greek art now extant as far as possible in chronological sequence and in geographical relation, and then on the base of this arrangement to enter on the mythical subjects which they represent. His task will then be one of interpretation. He must seek out the motive of each composition, the names and attributes of the beings represented by each figure or symbol. He must gradually master every phrase and idiom of the language of ancient art. He must read the expression of the mental qualities in the external form, he must appreciate that fine delineation of character which the ancients called ethnography. Having acquired the intuitive sagacity which at once recognises mythical affinities and distinctions, he will follow the history of the types by the aid of his chronological and geographical data. Art will be his guide to pursue the myth through all its windings and interpenetrations, its evasions and subterfuges—as his eye pierces through its Protean disguises, his mind will learn to analyse and decompose its subtle combinations. He will discern under the poetic or sculptural garb of the myth the traces of its more ancient hieratic form, half obliterated like the original text of a palimpsest. He will separate off from the primary idea such peculiarities of treatment as are the result of the conditions of art; he will distinguish the purely religious symbol from accessories chosen as a means of expression by the sculptor. He will detect the presence of an exotic element in the myth, and point out the probable sources whence it was derived. He will show how the streams of tradition flowing onward for a time in separate channels had a natural tendency to confluence as time and conquest broke down the barriers which

divided races—how, as the types of the earlier paganism were thus fused and blended, the language of art, expanding with these new ideas, became not figurative merely but transfigurative, more copious but more obscure, full of the barbarous corruptions of a pantheistic age.

Runic Memorials.

From ancient time poetry was highly esteemed and generally cultivated in the North. The mightiest kings and chiefs regarded it as a great honour to be praised by the songs of the bards or skjalds. A chief characteristic of the Danes and their northern kinsmen was a thirst for glory in this life, an honourable name after death, and above all, a high veneration for the gods. It was therefore a common custom to erect runic stones on the graves of well-known men and women. In several runic inscriptions in Denmark the mighty god Thor is invoked to protect the graves. His mark, the "swastika," is sometimes engraved on the stones, together with Odin's mark, the "triskele." In Norway and Sweden, but less frequently in Denmark, the graves were also adorned with high-standing "bautastones" without inscriptions. In Norway and Sweden the people continued, according to old heathen custom, to erect large barrows, in which the deceased chiefs were often buried in fully-equipped ships, with arms and ornaments, and with their favourite animals, chiefly horses and dogs, which were sacrificed to the gods at the burial feast. In certain parts of Sweden, chiefly in the island of Gotland, the images of the mighty gods were often engraved on the runic stones in honour of the deceased. On the top of the Sandastone is represented, in a special panel, the northern triad, Odin with the spear, Thor in the middle, and Frey with a large goose, which bends its neck over him. On other stones are represented Odin with his horse Sleipner, with the ravens Hugin and Munin, and the wolves Gere and Freke. The smaller graves were frequently decorated with surrounding stones, often in the shape of ships, by which doubtless not only ordinary ships were intended, but also Frey's sun-ship, *Skidbladner*, which is also represented on several runic stones in Gotland. Other low, triangular barrows, with sides curved inwards, which shape would otherwise be inexplicable, have evidently been shaped after Odin's mark, the triskele, and others again with straight sides after the triad mark, the triangle. Similar grave-mounds were also constructed in Denmark, but owing to the earlier influence of Christianity in that country they are found less frequently. Burial in ships has not yet been proved to have taken place in Denmark. A favourite burial custom in that country, and one not less imposing, was to bury the chiefs with their carriages and horses, so that they, as is told in the old Sagas, might make their entry with the gods and the Einheriars into the lofty Valhalla, either driving in their carriage or on horseback. Indeed, the carriages and horse-trappings, collar-harnesses, head-gears, bridles, stirrups, &c., which were placed in the graves plainly illustrate the peculiar richness and splendour which must have predominated in the time of the Vikings in Denmark.

Mosaic Glass-Painting.

The mosaic system of glass-painting is admirably adapted to the nature of the material. It is, however, unsuited for mere picturesque effect, owing to the nature of its colouring, which being produced by broad pieces of glass, whose tints can scarcely be varied either in the lights or shadows (the latter being represented by means of the enamel brown) imparts to works executed in this style the flat and hard, though brilliant character, of an ancient oil-painting. The revival of art in the sixteenth century, and the extraordinary effects then achieved in oil-painting, by which the hard and dry illumination of the Middle Ages was transformed into a beautiful picture, glowing with the varied tints of nature, and expressing to the eye, by a nice gradation of colouring, the relative position of near and distant objects, seem to have excited the ambition of the glass-painters. Not content with carrying mosaic glass-painting to the highest pitch of perfection it has hitherto attained, and with borrowing the excellent drawing and composition of the oil and fresco-painters, they strove to render their own art more completely an imitation of nature, and to produce in a transparent material the atmospheric and picturesque effects so successfully exhibited by the reflective surfaces of oil and fresco-paintings. The facility of applying colour to glass with the brush, at the pleasure of the artist, afforded by the discovery of the various enamel colours, about the middle of the sixteenth century, soon led to their extensive employment. It was not, however, until the eighteenth century that they entirely superseded the use of coloured glasses in large works. The introduction of enamels, though it certainly occasioned a great extension of the scale of colour in glass-painting, was not without its disadvantages. The paintings lost in transparency what they gained in variety of tint, and in proportion as their picturesque qualities were increased by the substitution of enamel colouring for coloured glass, their depth of colour sensibly diminished.

NOTES AND COMMENTS.

DEFECTIVE plans give rise to much costly litigation, and when it is remembered that the preparation of them is often entrusted to incompetent hands by solicitors, there need be no surprise at the consequences. We must confess, however, that we are amazed when we find the Corporation of London, that should set an example to men of business in all affairs, exhibiting the carelessness about plans which was revealed this week in the action about the site of Farringdon Market. The property was sold a couple of years back, and was bought by Mr. H. T. TUBBS for 98,100*l.* Attached to the descriptive particulars was a lithographed plan, which included property that could not be considered as belonging to the Corporation under the Act 5 Geo. IV. c. 151, which was the basis of their title. The extraneous portion (which was not possessed by the Corporation until 1864) formed about one-tenth of what was represented. It was one of the conditions that the purchase must be completed by June 24, 1892, and if there was any delay, unless it arose from the wilful default of the Corporation, interest at 5 per cent. was to be paid. In consequence of the duality of the titles it was not possible to make out a conveyance until September 29. The Corporation, however, insisted on the payment of three months' interest, although there could not be any doubt the delay was caused by their oversight. The case was heard before Mr. Justice CHITTY, who gave judgment in favour of the Corporation. The main ground of his lordship's decision was the clause in the conditions of sale about wilful default. It could not be supposed that the Corporation attempted any deception by issuing an incorrect plan, and a man who was not deterred by the clause is bound to abide by it. The judge also said that the purchaser could have inspected the original plans and compared them with the lithograph. With the utmost deference to his lordship, we must say that is a course which not one surveyor or solicitor in a thousand would adopt. The Corporation claimed to be possessed of a title under a special Act, and everybody was led to assume that they were about to transfer all that was comprised in that title, and not a hair's-breadth more of land. An Act of the kind is supposed to confer rights that are unquestionable. Besides, who could imagine that in so important a matter the Corporation would be at fault? The most wonderful part of the transaction is the claiming of interest for an interval when Mr. TUBBS could not be considered as purchaser, and did not enjoy the rights of an owner. Mr. Justice CHITTY's judgments will be invaluable precedents. Knowing that fact, he has to be circumspect and mindful of consequences. His lordship considered that if judgment were given against the Corporation, by considering the error to be a wilful default, it would be difficult hereafter for vendors to have the benefit of exceptions in conditions of sale. But if his lordship could treat the case by itself, we imagine his judgment would be in favour of the purchaser. The moral to be drawn from the action is that in case of sales lithograph plans are never to be trusted, unless there is a guarantee upon them that vendors will accept unrestricted responsibility for their accuracy, and that the phrase "wilful default" should always excite suspicion.

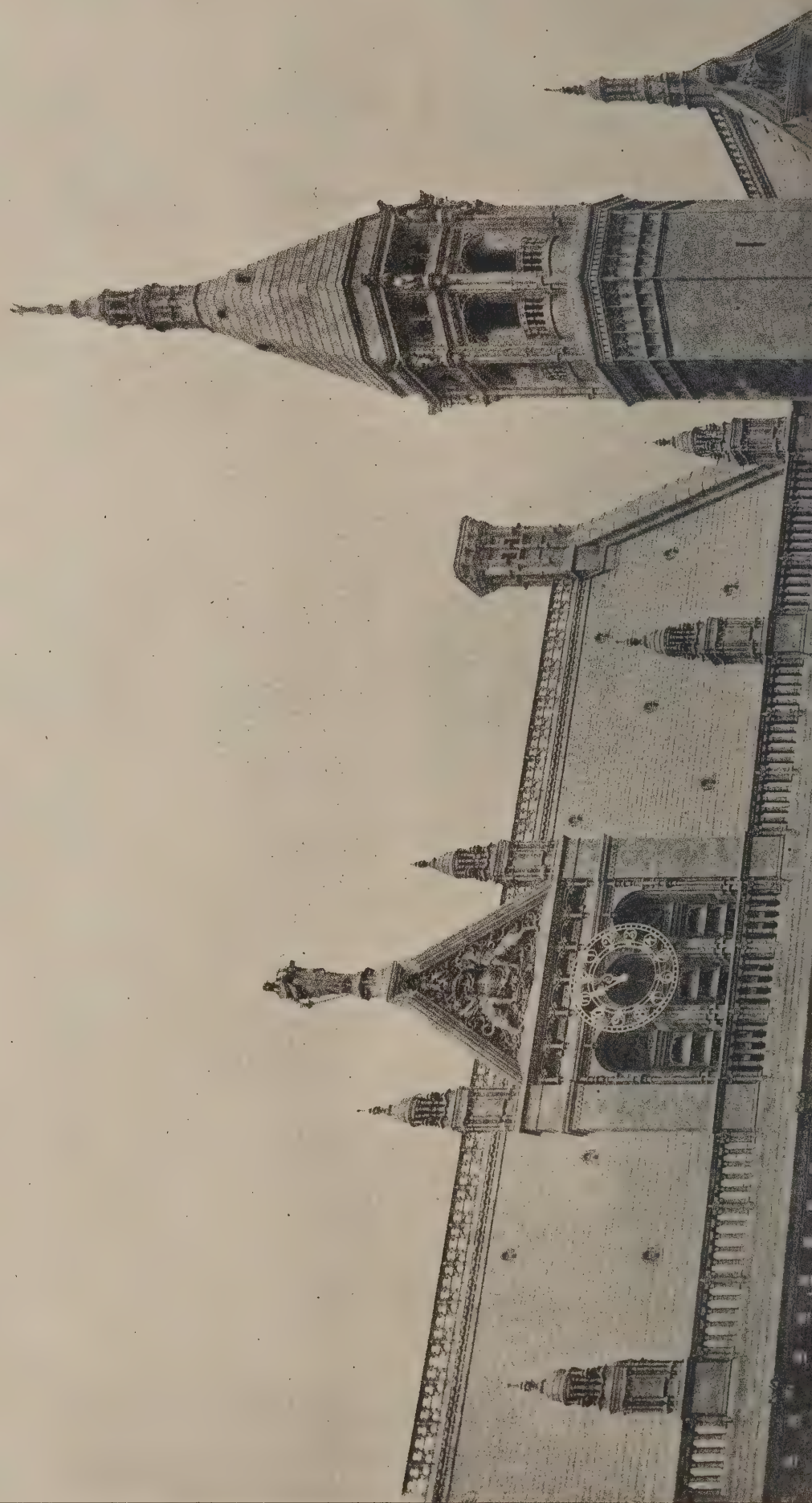
A COPY of a letter from ROBERT BURNS to PETER HILL, the Edinburgh bookseller, has been travelling from journal to journal as a discovery. It relates to the headstone which BURNS had erected at the grave of FERGUSSON, another poet, in the kirkyard of Canongate, Edinburgh, and runs as follows:—"My dear friend,—I send you by the bearer, Mr. CLARK, a particular friend of mine, six pounds and a shilling, which you will dispose of as follows: 5*l.* 10*s.*, per account, I owe to Mr. ROBERT BURN, architect, for erecting the stone over poor FERGUSSON. He was two years in erecting it after I had commissioned him for it; and I have been two years in paying him after he sent me his account; so he and I are quits. He had the *hardiesse* to ask me interest on the sum; but, considering that the money was due by one poet for putting a tombstone over another, he may, with grateful surprise, thank Heaven that ever he saw a farthing of it. My best compliments to Mrs. HILL.

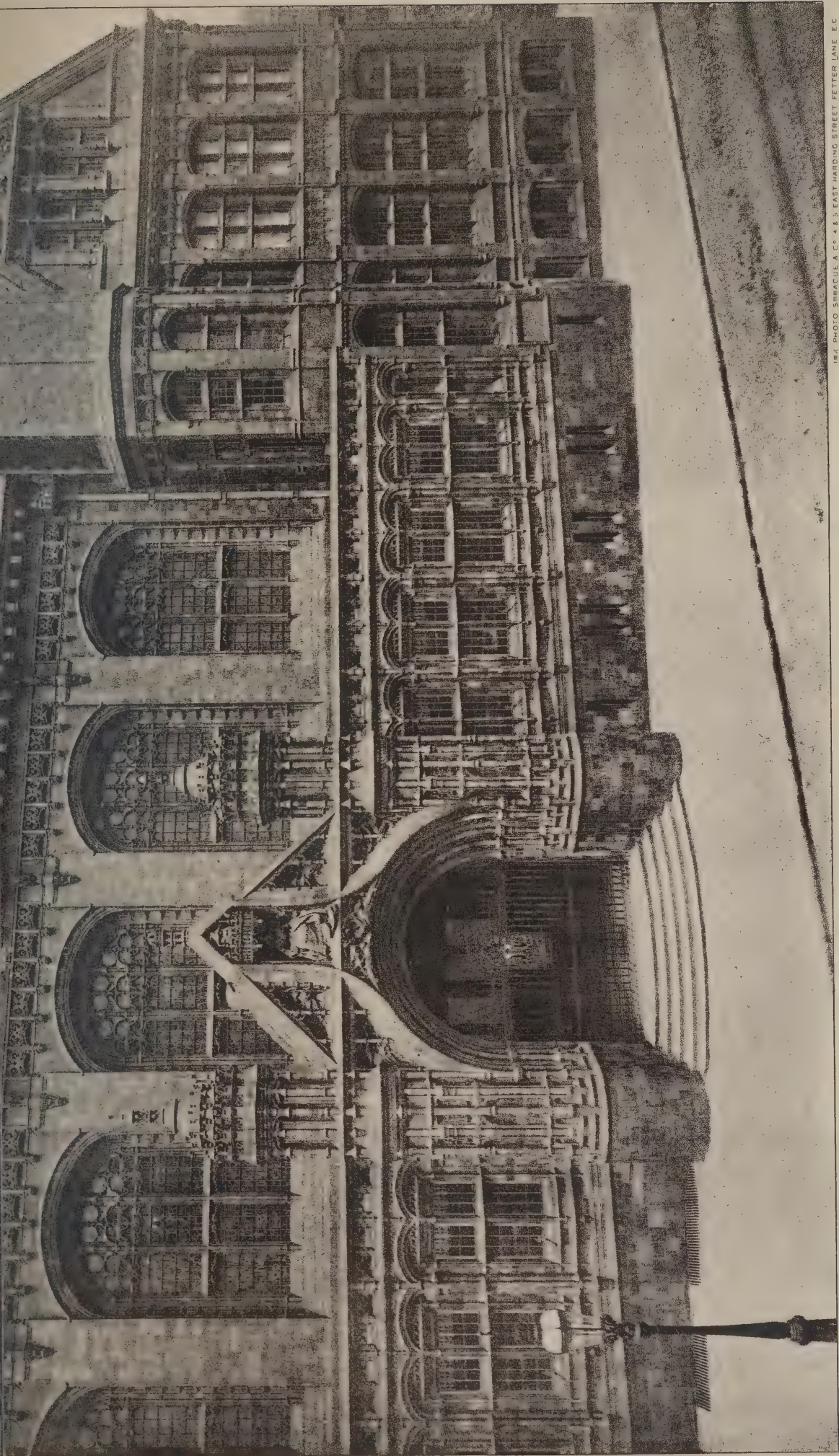
I sent you a mankin by last Friday's fly, which I hope you received.—Yours most sincerely, ROBERT BURNS." As the copy is headed "Burns and the Architect," we suppose it is now assumed that BURNS was exposing an attempt at extortion by an architect. The truth is, the letter (which has been several times printed since the poet's death) is a joke. ROBERT BURN was not an architect, but a partner in the firm of J. & R. BURN, stonecutters and masons. In sending the account for the memorial, he wrote to the poet, "I shall be happy to receive orders of a like nature for as many more of your friends that have gone hence as you please." The charges were evidently at cost price, and BURN was merely humorous when he asked for interest on 5*l.* 10*s.* 6*d.*, or, in other words, did not anticipate prompt payment. In a similar spirit the poet replied. The items in the account were as follows:—"54 feet polished Craighleith stone for a headstone for ROBERT FERGUSSON, at 1*s.*, 2*l.* 14*s.*; 10 feet 8 inches double base moulding at 1*s.* 6*d.*, 16*s.*; four large iron cramps, 2*s.* 10*d.*; two stones to set the base on at 1*s.*, 2*s.*; 320 letters on ditto at 8*s.*, 1*l.* 5*s.* 8*d.*; lead and setting-up ditto, 5*s.*; gravedigger's dues, 5*s.*" If all poets could be as economically entombed there would be fewer uncertainties about the positions of the narrow houses in which they were laid at rest. Fancy being able to have a quatrain by BURNS, to say nothing of a long prose inscription composed by WILLIAM SPOTT, clerk to the managers of the kirk and kirkyard, and the usual tombstone information engraved and leaded over one's remains for 1*l.* 10*s.* 8*d.*

In Italy agriculture is the most important of occupations, for the rural labourers number as many millions as there are thousands of industrial operatives. The quarrying industry is not, however, to be despised. In 1880 the total value of the produce of Italian quarries and kilns was estimated at 85,000,000 lire, and by 1889 it had risen to about 100,000,000 lire, or 4,000,000*l.*, one-fifth of which was contributed by the marble quarries of the Alps (Massa and Carrara). In 1890, 1,089,948 tons of marble, alabaster, granite, slate and various kinds of building stone were quarried in Italy, amounting in value to 27,765,484 lire. In the same year 11,290,229 tons of limestone, sand, gravel, lava and other materials used for building and road-making were produced, of a total value of 17,488,723 lire, and also 164,139 tons of mill-stones, pumice-stone, talc and other substances used for industrial purposes, worth 2,466,103 lire. The produce of the various Italian kilns in 1890 was 5,363,932 tons, valued at 103,010,946 lire. In all, then, the total value amounted to 150,731,256 lire, and exceeded considerably that of previous years. The hours of work in quarries are generally from ten to eleven per diem; the days of work are from 230 to 300 per annum, and wages vary from 60 centimes to 5 lire a day, according to the class of workers.

Two arbitration cases relating to claims for building works against the London School Board have been determined on remarkably economical terms. A year ago Messrs. ATHERTON & LATTA issued a writ to obtain payment of 733*l.* 0*s.* 3*d.*, alleged to be due for work done under the repairs schedule. A claim was also made for interest amounting to 60*l.* on overdue accounts, and for interest at 4 per cent. per annum from the date of the writ. A tender in cash, amounting to 40*l.* 13*s.* 2*d.*, had previously been made to Messrs. ATHERTON & LATTA to settle the account, but had been refused. The matter was referred by the Master to the arbitration of Mr. H. W. D. THEOBALD. It was agreed that neither of the parties should be represented by counsel or solicitors. The arbitrator has awarded to Messrs. ATHERTON & LATTA 325*l.* 18*s.* The costs of the award amount to 28*l.* 10*s.* Another writ was issued by Mr. PRICE (trustee of Messrs. BARLOW & ROBERTS) for the balance of 149*l.* 10*s.* 5*d.*, alleged to be due for repairs. Mr. L'ANSON was appointed arbitrator, and he has awarded to Mr. PRICE the sum of 13*l.*, and has given to the Board the costs of the reference, but has directed that the costs of the award should be borne by the parties in equal shares. The costs of the award amount to 52*l.* 10*s.*

The Architect, Feb. 16th 1894.

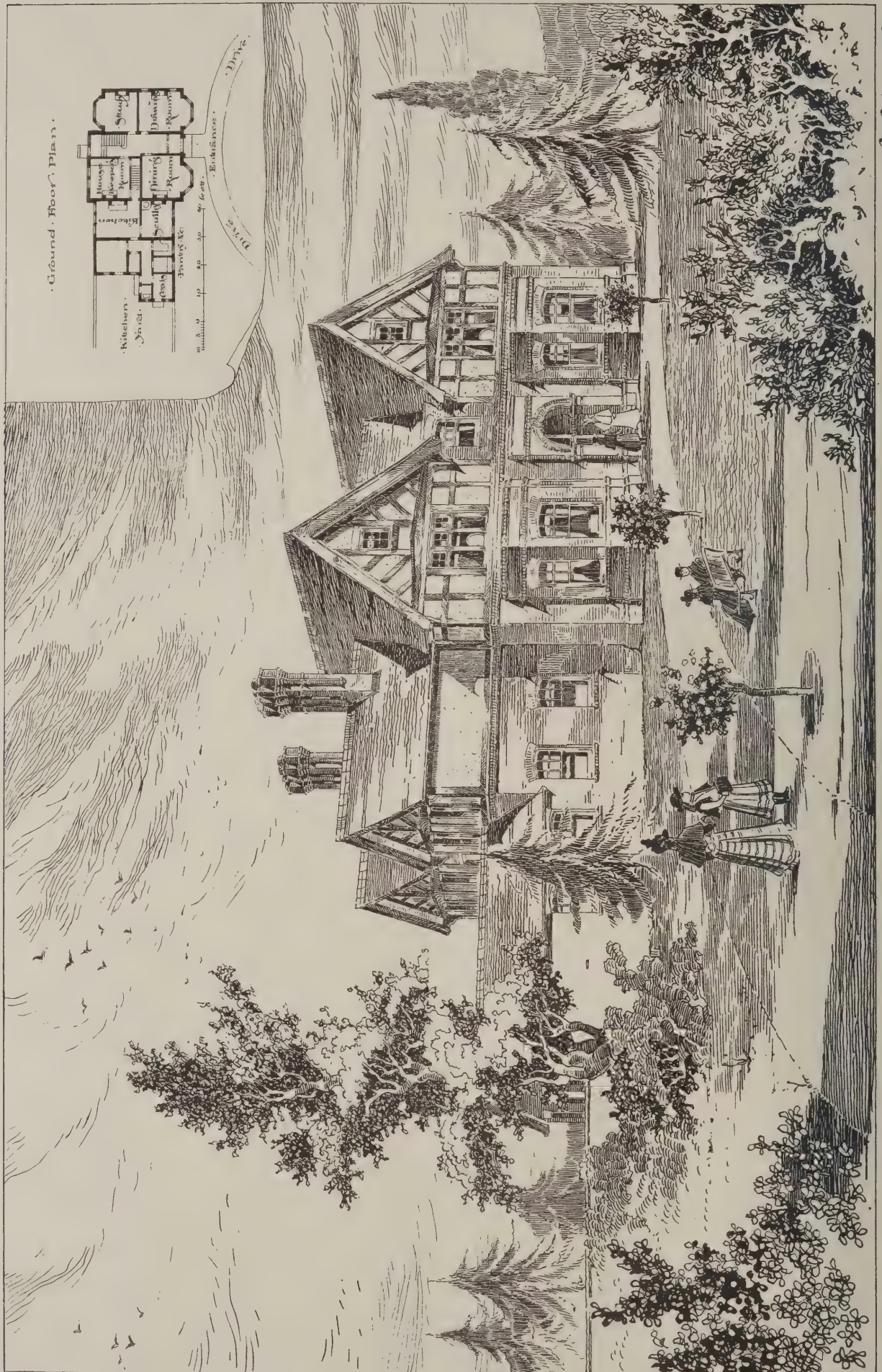




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1862. PHOTO SHREACUS & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

VICTORIA ASSIZE COURTS, BIRMINGHAM: DETAIL OF CENTRE BLOCK.
ASTON WEBB, Architect.





* • CHURCH • OF • THE • ENGLISH • MARTYRS • STREATHAM • S.W. •



CHURCH OF THE ENGLISH MARTYRS, STREATHAM, S.W.



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"BRITANNIA RECEIVING THE HOMAGE OF THE NATIONS."

Wall-Painting in Freemasons' Great Hall.

By J. M. BOEKBINDER.

ILLUSTRATIONS.

VICTORIA ASSIZE COURTS, BIRMINGHAM.

A GENERAL view of the Birmingham Courts was published lately in this Journal. We now show on a larger scale the central block of a building that has received general commendation from the Judges who have presided in it.

CHURCH OF THE ENGLISH MARTYRS, STREATHAM HILL.

THIS church, which is being erected, has been designed by Mr. A. E. PURDIE, Talbot House, Crownhill Road, Willesden.

NEW RESIDENCE, SULHAMPTON, BERKS, FOR GENERAL HAWLEY.

THIS house has recently been erected for General HAWLEY, on high ground, the site having been planted, &c., for a house some years ago. The house is built of red brick and half timber, the tiles being dark red. The contractor was Mr. W. H. SIMONDS, and the architect Mr. GEO. W. WEBB, Market Place Chambers, Reading.

BRITANNIA RECEIVING THE HOMAGE OF THE NATIONS.

THE Freemasons' Tavern in Great Queen Street was recently decorated in a costly manner by Mr. J. M. BOEKBINDER. In the great hall, which has so many historic associations with the craft, the wall-space at one end has been adorned with a large painting, of which we give an illustration. Adopting the system introduced by M. PUVIS DE CHAVANNES, the painting suggests to some extent a piece of tapestry, and is therefore not only expressive, but restful. At a time when foreign immigration causes uneasiness among London ratepayers, Britannia cannot offer much welcome to strangers, but when they come in graceful guise as the representatives of the arts and resemble the figures in the painting, they are not likely to be sent away unsatisfied. Masonry, like nature, can make the whole world kin, and the wall-painting is not without its mystic significance.

LONDON STREETS AND BUILDINGS BILL.*

THE subject for our consideration this evening is the Bill promoted by the London County Council to consolidate and amend the law relating to building in the administrative county of London, and is entitled the London Streets and Buildings Bill.

During the year 1891 the late Government prepared a Bill which proposed to consolidate the then existing Acts, and were prepared to incorporate with it such amendments of a minor and non-contentious character as experience in the working of the present Acts had rendered desirable; this Bill had made some progress, and several public bodies had sent in various suggested amendments, among which was a rather formidable array from the London County Council, of which it could not be said that all were of a minor or non-contentious character. But a change in the Government having occurred the Bill was dropped.

The London County Council, however, being desirous of ending the present anomalous state of things, whereby a builder is compelled, if he intends to keep in the right path, to make himself acquainted with something like thirteen separate Acts of Parliament, in addition to two or three sets of by-laws, and finding that the present Government had no time to prepare a Bill, decided to introduce one of their own, which is now before us.

I must assume that my audience is more or less acquainted with the Building Acts now in force, as the limited time at my disposal this evening will not permit me to go through the whole of the Bill, but only to touch on those points which differ from or amend the existing enactments. As to the necessity for consolidation only, I take it there can be no doubt, but it is only on the amendments that differences of opinion are likely to arise.

There appears to me ample evidence in the Bill that the suggestions made by different professional societies have been largely accepted, more especially those made by the Royal Institute of British Architects as to getting into one Bill all matters relating to streets and buildings, including lines of

frontage, sky-signs, &c.; but the London County Council have excluded, and I think wisely, for many reasons the suggestion that matters of drainage should be incorporated.

The Council, I think, have been anxious to make their Bill as complete and concise as the nature of the case would permit, and in my opinion they have succeeded, and the whole has been very carefully drawn and arranged.

The Bill is divided into fifteen parts:—

1. As to the formation and widening of streets.
2. Lines of building frontage.
3. Naming and numbering of streets.
4. Open spaces about buildings and height of buildings.
5. Construction of buildings.
6. Special buildings and temporary owners.
7. Rights of building and adjoining owners.
8. Dangerous and neglected structures.
9. Dangerous and noxious businesses.
10. Dwellings on low-lying lands.
11. Sky-signs.
12. Superintending architects and district surveyors.
13. Powers to make by-laws.
14. Legal proceedings.
15. Miscellaneous provisions, including the definitions.

There are four schedules, the first dealing with the structure and thickness of walls; the second defining what are considered to be fire-resisting materials; the third giving a scale of district surveyors' fees and fees payable to the Council in respect to proceedings under the dangerous structure clauses and the clauses relating to dilapidated and neglected structures or buildings; and the fourth relating to the Acts to be repealed.

We may, I think, pass over Parts 3, 6, 8, 9, 10, 11 and 12, which in the main simply consolidate the existing law, and confine ourselves to the new or amended clauses in the other parts.

Taking Part I, which deals with the formation and widening of streets, we find that the whole of the clauses have been entirely remodelled and simplified.

To anyone who is acquainted with the present regulations they will quite agree with the preamble of the new Bill, which states that "the existing provisions are complicated and in some respects doubtful and insufficient."

The existing law enables you to form a new street by giving four weeks notice to the Council in writing and, provided you comply with the by-laws, you may at the expiration of the time, proceed with your new street.

The Bill proposes to make all new streets subject to the approval of the Council, for which purpose plans and sections must be submitted, with such particulars in relation thereto as may be required, and the decision of the Council is to be given within three months after the receipt of the application, and if the decision is adverse to the applicant, he may, if he think the refusal unreasonable, appeal to the Tribunal of Appeal, of which further mention will be made later on. The time, three months, seems to be somewhat long, and might with advantage be reduced to six weeks.

There are in section 4 seven cases in which it shall be lawful for the Council to decline to sanction the formation of any new street, which cases seem to be fair and reasonable.

The rules as to widening existing roads or passage-ways and converting them into streets are very much simplified, and as heretofore plans must be submitted to the Council for approval, but with this additional advantage, that an applicant may, if he feels himself aggrieved at the Council's decision, appeal to the tribunal before mentioned.

There are in section 6 eight cases in which it shall be lawful for the Council to decline to sanction the widening of an existing way, which appear to me to be also fair and reasonable.

The Council also propose to take powers to enable them, should they deem it expedient in the public interest that any new street or widening of a street should by reason of its length or importance, or in consequence of its forming or being so situate as to be likely to form part of an important line of communication or other sufficient reason, be of a greater width than 40 feet clear, to make it a condition of their sanction that its width be increased to a maximum of 60 feet.

This, I think, is somewhat unfair to the applicant as it stands, as he has to sacrifice perhaps 50 per cent. more of his ground to form the street, simply because a road through it happens to be an important line of communication, which may or may not benefit his land; this is, of course, subject to appeal to the tribunal. But their appeal would, I take it, only decide how far it was for the public convenience, and could not deal with compensation for any sacrifice of ground which such public convenience might entail. There should be in fairness to the applicant a clause inserted to enable the Council, should the convenience of the public demand an extra width of roadway, to purchase such extra land required beyond the 40 feet at its market value.

Section 9 provides that buildings are not to be erected (without the consent of the Council) at a less distance than 20 feet from the centre of the roadway, if for carriage traffic,

* A paper read at St. James's Hall before the Society of Architects, by Mr. Ellis Marsland. Mr. George Baines, F.R.I.B.A., in the chair.

and 10 feet from the centre of the roadway, if for foot traffic only; this corresponds with existing provisions, but a further power is added enabling the Council to increase this distance to 30 feet in case of a carriage-way if, after consultation with the local authority, it is expedient in the public interest so to do.

I think this is also a little unfair to the applicant, unless compensation be granted, as I have previously suggested; as in some cases if the owner set back 30 feet the remainder of the ground might be valueless for his purposes. There is, however, in this case power of appeal to the tribunal, but I query as to whether they could deal with the question of compensation if they deemed it expedient to uphold the Council's decision.

The question of compensation is admitted in section 13, which deals with buildings projecting beyond the general line in a street, should they be destroyed by fire or other casualty, or demolished, pulled down or removed to a greater extent than one-half. In such cases the Council may require the said building to be set back and grant compensation to the owner, the amount of which, if not agreed among the parties, may be referred to the tribunal of appeal.

There is a proviso at the end of this section which, I think, should be known, as it is not in the present Acts. It runs thus:—"Provided that the tribunal in assessing the amount of such compensation shall take into consideration any increased value or improvement which may accrue to the building or other property of the same owner by reason of the setting back of the building." This has a flavour of "betterment."

Section 14 is a new provision giving the Council power in sanctioning plans for a new street (not being within three miles of St. Paul's Cathedral) to require a forecourt not exceeding 5 feet wide on one or both sides of the road; such forecourt may be enclosed in the case of private houses, but in the case of shops, public and refreshment houses, to be left open and dedicated to the public.

I think the forecourt is a good provision, but whether the retail trader will like his shop set back 5 feet from the foot-way is open to question, notwithstanding the compensating advantage the forecourt gives him to display his goods, as he generally prefers, at considerable inconvenience to passengers, to place them on the public way.

A like provision is inserted for existing private houses with forecourts when adapted for shops, &c., to be similarly treated. I have dealt somewhat at length with this division of the Bill, as so many of its provisions are new.

Coming to Part II., which deals with lines of building frontage, we find that—

The present rules are retained, and that no building or structure shall be erected beyond the general line without the consent of the Council, such general line to be defined by a certificate of the superintending architect, subject to revision by the tribunal.

Should the Council grant consent to a building beyond the general line, they propose to make it a condition that land to the extent they may think proper be dedicated to or left open for the public use, and that the building for which consent is given shall only be used for such purposes as may be specified, or shall not be used for any particular purpose, as the case may be, and may generally impose any other condition deemed expedient in the public interest. This is generally now done by the Council, but the right to do it is perhaps open to question. These provisions, however, make it clear.

Passing over Part III., which deals with the naming and numbering of streets, and needs little comment by architects, we pass to Part IV., which contains perhaps the most contentious portions of the Bill, dealing as it does with open spaces about buildings and the height of buildings, and alters the existing law to a very large extent.

Section 29 provides a very useful amendment as to open spaces to be provided in front of buildings which do not front upon a public way. It often happens that blocks of dwellings are placed one behind the other or fronting one another, and an insufficient amount of space is left between the blocks. This section provides that where the blocks are 40 feet high and upwards, 40 feet shall be the minimum amount of space provided in front of them, and if the buildings are less than 40 feet high then the space left is to be equal to the height of the building, but in no case less than 20 feet. I fail to see that this will be any hardship, but will, I think, be rather helpful than otherwise to the architect, as it will provide him with a fixed rule to enable him to overcome the arguments of an exacting and perhaps unscrupulous client who does not so much consider the health and convenience of the tenants as his own profit; and at present an architect is often compelled to crowd blocks of buildings together when his better judgment would lead him to keep them further apart.

The want of a rule such as this has caused large areas of ground from which insanitary dwellings have been removed to be again covered with high blocks of buildings, which will be in a few years, if they have not already so become, little better

from a sanitary point of view than the dwellings which preceded them.

It will be observed that this section applies to domestic buildings only, and not to blocks of offices and warehouses, and disarms to a large extent the opposition which might otherwise be expected.

A question, I think, might be raised on this section as to what was to be considered the front of a building, and this point should be defined, or the clause-redrafted and made to state definitely the spaces between blocks of dwellings, although section 34 may help in the matter, but it would be as well to save as much as possible appeals to the superintending architect.

Section 30 is an attempt to provide an adequate amount of open space in the rear of new buildings. At present the amount of open space required upon rebuilding a dwelling-house upon an old site is 100 square feet, which may be either at the side or in the rear, and need have no relation whatever to any room or window it is supposed to benefit, and need not be at the ground or any fixed level.

When a dwelling-house is erected upon a site not previously occupied by a building the open space in rear is regulated according to the frontage—from a minimum amount of 150 square feet for a dwelling-house having a frontage of 15 feet up to a maximum amount of 450 square feet for a building exceeding a frontage of 30 feet—and such open space is to be provided above the level of the ceiling of the ground-floor storey, and is to extend throughout the entire width.

This does not work well in all cases, for where there is any projecting addition to the building in rear which extends beyond the back front of the main building a very small space suffices to meet the terms of the section from which I have quoted.

It is now proposed to have a minimum of open space amounting to 150 square feet, but that there shall be a distance of at least 10 feet from the back of any building or addition in rear from the boundary of the property or other premises. This space is to be at the ground level in the case of a domestic building, and is to be open except a water-closet and receptacle for ashes, and in the case of a building other than a domestic building, the open space is to be provided 12 feet from the ground. This will insure in most cases more than the minimum of 150 square feet, as will be seen in the case of a building of 15 feet frontage, the whole of which space is obtained irrespective of any space left open alongside any projection from the back front.

In addition to this it is proposed to further increase the open space should the building exceed in height the space formed by a horizontal and diagonal line, which will perhaps be better explained by the diagram. It is proposed to draw a horizontal line at the street level through the centre of the plot of ground to the rear boundary; it is then proposed to draw from a point at the extreme boundary, a diagonal line at an angle of 45 degs., and no part of the new building is to come outside the space so drawn, except dormers, chimneys, gables, turrets or other architectural ornaments, aggregating in all to not more than one third of the width of the real elevation of such building, and when any doubt arises as to the application of this rule the Council's decision to be final.

I must confess I do not like this proposition, as it would tend to cut buildings about too much, and form awkward-shaped rooms and loss of much useful space, and would foster underground rooms, as where an owner found he could not go up he would go down, which is undesirable.

It is a very difficult subject with which to deal adequately, for although an increase of open space in rear is desirable, to make a rule for universal application is by no means easy, for what would be easy and fair in the suburbs, where land was less valuable, would be difficult and unfair where land was more valuable.

I think the method adopted in the model by-laws is as practicable as any, and that is starting with a minimum distance of 10 feet, as the new Bill proposes; this distance is increased according to the height of the building, not perhaps to the extent of the model by-laws; but I would suggest 5 feet additional distance for every 10 feet in height of the main building over 30 feet, and any additions from the main building carried up only to two-thirds the height of the main building.

There are also rules in section 32 which practically mean—when you find the new method does not work apply to the Council.

Provision should also be made to prevent any open space provided in rear being built upon, for which no provision is made in the Bill. *(To be concluded.)*

Mr. Whitworth Wallis, of Birmingham, on Sunday lectured in Manchester on "Sicily and its Art Remains." Two more lectures on the subject will be given.

THE DOMESDAY SURVEY OF WORCESTERSHIRE.

A PAPER was read at the last meeting of the Worcester Diocesan Archæological Society by Mr. Willis Bund, on the Domesday Book and the evidence it supplied about the condition of the county. According to the author, the Domesday was not in any sense a complete survey of the county, but a survey ordered by the king for the purposes of taxation, and only included the land which was subject to taxation, private land, such as the Hams, which were exempt from taxes, being excluded. They must not take the number of people mentioned in the Domesday Book—4,000—as representing the total population of the county. For instance, only one monk was mentioned at Evesham, whereas he would show that there was a large number, and there were only five churches mentioned, while probably there was a very much larger number. The fact was they could only get such details of names and land as were necessary for taxation. He had often heard it argued that because a thing was not mentioned in Domesday it did not exist, but that was an unsafe way of arguing, because unless the mention of a thing was necessary for taxation it was not included. A second point was that the Domesday Book did not give them a list of the parishes in the county. It only gave them a list of the manors in the county, and manors and parishes were by no means the same. The manors in the times of the Domesday were very much larger—they were afterwards subdivided—and consequently it was a matter of extreme difficulty to trace out limits of the land prescribed in Domesday. The modern parish by no means represented the old manor, although the name might be very similar. The history of the formation of manors and parishes was a very important and interesting one, especially at the present time when an attempt was being made to revive the old manorial assemblies in the form of parish councils, but it was one that could not be treated incidentally. The only point now to be insisted on was that Domesday was a manorial not a parochial survey of the country. Another point to be remembered was that the Domesday Hundreds, though in some cases having the same names as the present Hundreds, were by no means identical with them, that in fact they were now much larger, several of the Domesday Hundreds having ceased to exist. But it must be borne in mind that the Domesday Hundreds were made out of manors, the modern Hundreds of parishes, and this would go some way to account for the difference. The taxes that were levied under William and for which the Domesday survey was taken were in the main two geld, or Danegeld, which was a charge on each hide of cultivated land. William levied it at the rate of 2s. a hide. Probably the tax imposed in 1083-84 of that sum did not produce as much as was expected, and one reason for the Domesday survey was that the exact sum that a levy of geld would produce might be known. Hence it was that the survey, after mentioning each manor by name and who held it, then went on to say how many hides there were paying geld. There was also another tax levied on the number of ploughs; hence the mention of the ploughs in each manor, both those of the lord and those of the villein. So that the tax might be made to yield its proper proportion and to prevent an evasion of taxes—a matter that seemed not to have been unknown even in those early days—not merely the actual number of ploughs in use was given, but also the number that ought to be used, and there was but little doubt that the tax was levied not on the ploughs that were used, but on the ploughs that ought to have been used.

The three great Worcestershire abbeys were Pershore, Evesham and Worcester. Their importance measured by their estate was as follows:—Worcester had 19 manors, with 175½ hides paying geld; Evesham had 15 manors, with 140½ hides paying geld; Pershore had six manors, with 95 hides paying geld, so that between them the three had 40 manors, with 411 hides that paid tax. So far the main difference between the three houses appeared to have been in the size of the estates and the amount of the contribution to the Exchequer, but there was one fact that greatly altered the position of the Worcester house, and that was the influence of the bishop. The peculiarity with regard to the Worcester house was that the bishop seemed to have had a very remarkable power over it, and to have selected the best of the lands of the Worcester monastery for himself. He did not appear as the owner or holder from the Crown of any land in Worcestershire. All the land was held by the monastery, but the bishop appeared to have had various rights which were probably greater than those enjoyed by most subjects. Over 300 hides in the Hundred of Oswaldston he had the exclusive right of having all fines, forfeitures, and of holding all courts. He was, therefore, he would not say exactly in the position of king, but of being the source of all the jurisdiction over those 300 hides; and a hide being 100 acres, in a considerable portion of the southern part of the county the bishop was practically supreme. It was a curious point how the bishop could have this control when he was

really not the owner of the lands—the monastery being the owner. He could only give one explanation. In the Celtic, and probably in the Early British Church, the bishop was not what they knew him to be, a diocesan bishop, having control over a certain area, but he was an official of the monastery. That was certainly the case in Ireland; he believed it to be the case in Wales and also in the British Church generally. All the possessions were the possessions of the monastery, which was the religious settlement, and the bishop one of the officers of the monastery. Gradually the bishop came to be the head of the monastery, and the abbot and the bishop came to be the same person, and consequently the bishop, as the head of the monastery, had the management of all its property. In the time of Augustine, when the bishops began to have dioceses and became rulers over a distinct territory, the idea of the monastic bishop died out. But he thought the Bishop of Worcester found himself in a very comfortable position at the head of the monastery, and he was loth to give up the privileges he had exercised. Although the land belonged to the monastery, as it had always done, the bishop made a successful endeavour to retain the privileges which belonged to the head of the monastery, and consequently he retained the right of jurisdiction over a very large area of the county, and other rights and privileges as well. He really got all the advantages of a great landowner without the responsibilities and disadvantages. The monastery paid the taxes; the bishop held the jurisdiction and got the profits from the courts and the fines. The bishop's position was almost unique, and was certainly of considerable profit to him, and, he was going to say, of considerable loss to the monastery, but the whole position of the bishop with regard to the monastery of Worcester was one of very great interest, and would well repay prolonged and careful investigation. Of the nineteen manors the monastery of Worcester held of the Crown, the bishop held eight from the monastery, and the number of hides in the bishop's right that paid taxes was much larger in proportion than in the manors of the monastery. In other words, the bishop had secured the richest and the best manors for himself. It seemed clear that the jurisdiction of the bishop was twofold over the manors he held from the church of Worcester. He exercised ordinary manorial jurisdiction concurrent with that of the Crown; over the 300 hides he exercised an exclusive jurisdiction, independent of that of the crown; and he made good his claim to the satisfaction of the Domesday Commissioners.

In considering the question of the settlement of Worcester it was important to notice that a considerable part of the county was outside the pale of ordinary law, that the king's writ did not run there, and that a person who, so far as Worcestershire went, was no tenant of the Crown, was in all matters and in all causes, ecclesiastical as well as civil, supreme. The speaker then referred to the obligation which there was certainly in the case of Evesham, and probably also that of Worcester, to maintain men-at-arms for the king's service. This placed the defensive force of the country in an entirely new light, when it appeared that the men who composed it were not merely the vassals and tenants, the farm labourers and dependents, mustered for defence when required and then going back to their farm labours, but also trained soldiers who could take the command of the labourers, and whom the religious houses had to maintain for the defence of the country. In this they saw the beginning of the custom that was so zealously prohibited by the later Plantagenets and early Tudors, of private individuals keeping up a force to enable them to attack or to repulse their neighbours' attacks. This fact also gave them another reason for William's apparent harshness in putting into English ecclesiastical offices Norman bishops and abbots. He could not allow any one whose fidelity was doubtful to maintain an armed force. It would, therefore, not appear wonderful that among the steps William took to establish his power in this country was the manipulation of the abbeys and bishoprics. To those who submitted great favour was shown; on those who did not submit William's hand fell heavily. The speaker contrasted the treatment of the Abbot of Winchcombe and the Abbot of Evesham, the former being deprived and imprisoned, while the latter, who submitted and remained true to William, received great favours and increased powers. Mr. Willis Bund showed that the Worcester and Evesham abbots submitted at a very early period, and thereby saved most of their estates. Their example, he said, was followed by the other houses, and it was one of the curious points in the Worcestershire Domesday how little as a rule was lost by the ecclesiastical landowners. What was lost could be explained on other grounds than Crown confiscation. There were great changes. The old men were displaced for new ones, but in mere extent of possessions the religious houses lost little.

Referring to the Sheriff Urso, who was said to have been the chief of the subsequent spoilers of the monastery, the speaker admitted that there were numerous instances that, at first sight, went to prove it, but it was possible that there might

be another side of the question, and that even Urso was not so bad as it was the fashion to make him out. It must be remembered that Urso was sheriff, and that it was his duty as sheriff to seize and take possession of any land that a person had obtained a judgment to recover from another. It was his duty to hold lands in his possession which were disputed, and the probability was that he seized the land and kept it. He seized land of which the ownership was doubtful, and retained it until ownership was proved. Claims to ownership were never admitted, and the time for delivering it up never arose. Evesham lost a lot of land in these disputes. There was a claim by Evesham to Bengeworth, and the claim was referred to a council. The sheriff took possession of the land, and he certainly held Bengeworth for over 200 years, and although we spoke now of the delays of the law it was probable that cases lasted much longer in those remote days. Thus the sheriff got possession of lands, and he retained them, but it was more likely that he got eventual legal possession of them than was generally supposed. In this dispute Evesham was despoiled of a good deal of land by the sheriff. Worcester also lost some land. A great dispute was as to the right of the bishop over the south of the county, and that Abbot Walto disputed. This dispute was referred to a court of the king's barons, and Freeman's History said that in consequence of the decision the sheriff took possession of the land to hand it over to Worcester, but he did not do so. Mr. Willis Bund further remarked that the Domesday only mentioned one monk. It said that there was a monk placed in the church of Evesham to pray for the soul of Earl William. The church of Evesham did not seem to have objected when they got 240 acres of land to support the monk to allow prayers to be said for Earl William, although he had plundered many monasteries. Yet at this time it was clear that the Evesham monastery had at least 100 monks. Probably there were as many at Worcester, and perhaps 50 at Pershore.

A curious point was that Worcester was the largest holder of slaves of any of the monasteries of the county, and certainly one of the largest in the country. The county had 1,520 villeins, of whom Worcester had 216. Worcester had 131 out of the 1,728 bordarii, 116 of the 622 male slaves and 25 of the 101 female slaves. His suggestion was that the slaves came from the expeditions into Wales. When Wales was invaded, any prisoners who were taken were brought back as slaves and put to work on the lands of the monastery. He was aware it was said that the slaves were to a great extent criminals—criminals who had not the money to pay the fines for their offences, which were all condoned for a money payment more or less. He thought the Domesday Book, by showing that Worcester were the great slave-owners of the county, brought before them a feature of history which they would otherwise not get. It was remarkable to find the house of the blessed Dunstan, who had done more than anyone else to do away with slavery in England, was so long a holder of slaves. The number of female slaves was larger than in any other county mentioned in Domesday. In proportion to population Pershore had more bordarii than Worcester and fewer villeins and slaves. That was what they would expect, Pershore being rather in the second line of defence, and very likely having taken less prisoners. Evesham had 156 villeins compared with Worcester 216 and Pershore 115, and 96 bordarii against Worcester 131 and Pershore 113, and 42 slaves against Worcester 131 and Pershore 24. Mr. Willis Bund further remarked upon the large proportion of the total of the slaves in the country which were to be found in the Welsh border counties, Worcestershire having more than other counties, and upon the stimulating effect the slave market at Bristol might have on slave traffic.

PARTY STRUCTURES.*

(Concluded from page 99.)

NOW we come to "Party Structures." I must say a few words on this portion of the subject. The definition in the statute says, "Party structure" shall include party walls, and also partitions, arches, floors and other structures separating buildings, storeys or rooms which belong to different owners, or which are approached by distinct staircases, or separate entrances from without.

Then we have in section xxiv.:—"Every party arch and every arch over any public way or passage, &c., shall be constructed in a certain way. Please note the "and" here. This section and the definition of "party structure" contemplate clearly the construction of party arches.

Next we have the fourth right of the building owner in section lxxxiii.:—"In the case of buildings having rooms or storeys the property of different owners intermixed, the building owner has a right to pull down such of the said rooms or storeys, or any part thereof, as are not built in conformity with

this Act and the two preceding Acts, and to rebuild the same in conformity with this Act"—that is, I understand it, with proper party walls of incombustible materials, in accordance with section xxiv. And the enactment as to the expenses in section lxxxviii., namely, that the expenses "are to be borne jointly, regard being had to the use that each owner makes of such rooms or storeys." Clearly by this it is supposed they still will use such rooms or storeys. But then we have in section xxvii.:—"Every building shall be separated by external or party walls from any adjoining building." I will illustrate an example of a party structure by a case which occurred within my own experience. A was building owner of a house in X street. B was adjoining owner of a house in Y street. A pulls down his house, and finds that B has a room on ground floor that extends right beyond the other portions, i.e. as shown on plan G I K L. This B has owned as long as can be remembered, but there are no deeds to show where the boundaries between the two properties are. Can it be contended that A has a right to put up the party wall at G L, and remove this portion G I K L at ground floor and add it on to his house? I do not think so, any more than that B could have the right to put the party wall at I K. All A has the right and would be called on to do would be to construct the floor over and under ground storey in accordance with section xxiv.—that is, either with arches or an incombustible floor, though this will not be literally in accordance with section xxvii., rule 1. There is clearly an omission in the Act. Either "party wall" should have included "party structure" in the definition, or rule 1 of section xxvii. should be, "Every building shall be separated by external walls or party structures from any adjoining building," as the definition of party structure includes party walls, but it is quite clear that party structures were contemplated by the Act, otherwise they would not be enacted for as they are.

3. The Statutes and Enactments now in Force. The Rights of Building and Adjoining Owners.

Part 3 of the 1855 Buildings Act, section lxxxii. explains that the building owner is the owner of premises adjoining a party structure, who is desirous of executing any work to a party structure; the owner of the premises on the other side being called the adjoining owner. As to who is an owner under the Act, the definition in the statute is as follows:—

"Owner" shall apply to every person in possession or receipt, either of the whole, or of any part of the rents or profits of any land or tenement, or in the occupation of such land or tenement, other than as a tenant from year to year, or for any less term, or as a tenant at will."

There are many Superior Court decisions on this subject, but I only propose to touch upon a few:—In *Hunt v. Harris*, the judges (Chief Justice Erle, Justice Byles and Justice Smith) decided that the owner responsible for the payment of his share of a wall that was rebuilt, after having been condemned as a dangerous structure, was the beneficial owner, who held a long lease of certain premises, and not his underlessees, but it was remarked by Mr. Justice Smith that it was expedient to deal with each case as it arose. In *Filmingham v. Wood*, Mr. Justice Chitty decided that it was necessary to serve party wall notices on every underlessee, whose term was greater than that of a tenant from year to year. It will be seen by these two decisions that it is necessary to serve underlessees with separate notices, though in the case of a dangerous wall which has been condemned, they may not be responsible for the cost of rebuilding. In the case of *Cubitt v. Porter*, it was held that in the absence of evidence of ownership of a party wall, which is included in "party structure," a jury is entitled to find that it is owned by the adjoining proprietors as tenants in common. But in the *Standard Bank of Africa v. Stokes*, whatever the rights at common law in the case of buildings under the Act, such a right no longer exists, but the right depends upon the Act itself. This is a very important decision and shows us how necessary it is to follow out strictly all the enactments. And again, in *Cubitt v. Porter*, the common user of a wall separating lands belonging to different owners is *prima facie* evidence that the wall and the land on which it stands belongs to the owners of those adjoining lands in equal moieties as tenants in common.

The general practice, as far as I know, among architects is to serve notices on the underlessees, and in certain cases to receive contribution from them.

Section lxxxiii. gives the rights of the building owner. Section lxxxviii. enacts how the expenses shall be apportioned.

I think, perhaps, it will be best to read these sections together. The building owner shall have the following rights:—

1. To make good or repair any party structure that is defective or out of repair, and the costs in such case shall be borne by the building owner and adjoining owner in due proportions, regard being had to the use each makes of the structure.

2. To pull down and rebuild where so far defective or out of repair as to be necessary or desirable, and the expense shall be

* A paper read at the Architectural Association on February 2, by Mr. E. Woodthorpe, M.A.

borne jointly, regard being had to the use each makes of the structure.

3. A right to pull down any timber or other partition that is not in conformity with this Act or with the two preceding Acts, and to build a party wall, each owner bearing his due proportion of the cost, regard being had to the use he makes of the structure, and also to the thickness required by each building.

4. In the case of buildings having rooms or storeys, the property of different owners intermixed, a right to pull down such of the said rooms or storeys not in conformity with this Act and the two previous Acts and to make conformable, the cost to be divided, regard being had to the use each owner makes of such rooms or storeys.

5. To pull down irregular arches over passages belonging to other persons, on the same terms as to costs.

6. A right to raise any party structure permitted by this Act to be raised or any external wall built against such party structure on condition of making good all damage to adjoining owners' premises or to internal decorations, and on condition of carrying up to the requisite height all chimneys of the adjoining owner on or against any such party structure or external wall.

The cost of all this is to be borne entirely by the building owner.

It must be remembered that this clause does not give the building owner any right to raise a structure so as to obstruct ancient lights in the adjoining premises (see *Crofts v. Haldare*, before quoted), and of course the wall must be the requisite thickness required by the statutes to allow of the extra height. Under this section the building owner has the right to underpin. The Master of the Rolls (Jessel), in *Standard Bank of Africa v. Stokes*, explained that the word "to raise" meant *inter alia* "to extend, to enlarge," and accordingly this clause allowed the extension of the wall downwards in underpinning.

In the case of *Bradbee v. Christ's Hospital (Governors)* it was held that "the defendant had no right to underpin the party wall, either partially or wholly, unless that could be done without injury to the plaintiff's house, even though it might be doubtful whether the interests of the parties were several or whether they stood in the relation of tenants in common."

I think it necessary to mention shortly a case recently decided, namely, *Williams v. Bull*. Williams, the plaintiff, owned a house. After serving notice on the adjoining owner, Bull, the defendant, Williams pulled down the party wall separating his house from the defendant Bull's house. He then rebuilt the wall partly on his own land and partly on Bull's land, but raised it to nearly double the height at his own expense. In course of time the defendant Bull pulled down his own house and rebuilt it to a greater height, using the upper part of the wall in accordance with a party wall notice. The plaintiff, Williams, then brought a trespass for interfering with the upper part of the wall that he had raised, seeing that the defendant had not paid for it. Mr. Justice Mathews gave his judgment in favour of the defendant.

It is not at all clear to me from the report I saw of the case whether there was any award in either case. I should think not, otherwise it would never have arisen. I shall only make one remark on the case, namely, that it seems to me an unfair decision and contrary to the recognised custom, but I cannot help thinking there was either some other point in the case, or the action should not have been one for trespass but for the sum of money for the share of the wall built by the plaintiff and afterwards used by the defendant. Apply this decision to the first case I illustrated of the lean-to roof, and a great injustice might be perpetrated, but every case must be considered on its own merits.

In excavating ground for building or repairs any carelessness or negligence causing or accelerating the fall of an adjoining house will give a good cause of action (*Dodd v. Holme*).

And a man who orders a work to be executed on his own premises lawful in itself, but from which, in the natural course of things, injurious consequences to his neighbour must be expected to arise, unless means are adopted by which such consequences may be prevented, is bound to see to the doing of that which is necessary to prevent the mischief; and cannot relieve himself of his responsibility by employing someone else to do what is necessary, and so prevent the act he has ordered to be done from becoming wrongful (*Bower v. Peate*).

Then we come to 7. Right of building owner to pull down any party structure of insufficient strength for his purpose and to rebuild the same of sufficient strength on condition of making good all damage, the whole expense, including all the damage, to be borne by the building owner.

8. A right to cut into any party structure on condition of making good all damage, the whole cost, including the damage, to be borne by him.

9. He may cut away any footing, any chimney-breast, jambs, or flues projecting from any party wall, to erect an external wall against such party wall, or for any purpose, on condition of making good all damage; similarly the cost of all this must be borne by the building owner solely.

Of course, in the case of cutting down a chimney-breast,

provided the district surveyor has first certified that it may be done without danger to any adjoining building in accordance with rule 15, section xx.; and, of course, provided that he gives another footing to the wall where cut away, either lower down by underpinning or in his own wall, otherwise he would be causing damage to the wall, and further, it would contravene the first schedule by not having proper projection of footing on either side thereof.

10. The building owner has a right to deal with the wall of an adjoining owner that overhangs his ground, on condition of making good all damage.

11. A right to perform any other necessary works.

But it must be borne in mind that unless either the consent of the adjoining owner or a proper award has been obtained, these works cannot be carried out by the building owner, even though he has given the three months' notice—I mean, if he wishes to act within the law and protect his client from hostile action.

Again referring to the case of the *Standard Bank of Africa v. Stokes*, such a work as underpinning, even though unattended by any danger to the wall, cannot be carried out where a difference has arisen between the building owner and the adjoining owner unless they concur in the appointment of one surveyor, except by an award as provided by section lxxxv., rule 7. A building owner who pulls down a party wall is not bound to protect, by a hoarding or otherwise, the rooms of the adjoining owner during such pulling down and rebuilding (*Thompson v. Hill*); only I must say this is not the usual custom.

Section lxxxiv. deals with the requisitions of the adjoining owner to the building owner to build chimney-jambs, breasts, flues, piers or recesses.

4. The Usual Procedure.

Section lxxxv. gives the rules to be observed with respect to the exercise by building and adjoining owners of their respective rights.

Rule 1 of section lxxxv. says:—No building owner shall, except with consent of adjoining owner, or where structure is dangerous and has been condemned, exercise any right unless he has given three months' notice. If the wall has been condemned as a dangerous structure, it would be lawful for either owner to take down the party wall without the three months' notice, but when it has been taken down the usual procedure will have to be gone through before it can be rebuilt again.

Rule 2 states that the notice must be in writing or printed, and state the nature of the proposed work and the time at which it is proposed to be commenced.

3. That no building owner shall exercise any right to the inconvenience of adjoining owner.

5. Deals with the requisitions of the adjoining owner.

6. If either owner does not consent within fourteen days after the delivery of any notice or requisition, he shall be considered to have dissented, and a difference shall be deemed to have arisen.

7. In all cases not hereby specially provided for the building owner and adjoining owner, unless they concur in the appointment of one surveyor, shall each appoint a surveyor; the two surveyors shall select a third surveyor, and such one or three or any two of them shall settle by their award all matters in dispute, including the costs of award. "Such one surveyor" of course refers to the surveyor appointed by both the building owner and adjoining owner, and not the third surveyor; he, the third surveyor, is not an umpire, but only on an equal footing with the other two, although he generally has to adjudicate between them; but it must be remembered that an award signed only by him as third surveyor is not in accord with this section; either one or both of the other surveyors must sign as well. Whenever possible it is best to have the signatures of all three surveyors. It is also necessary for the two surveyors to select a third surveyor, though it is not imperative to call him in; but it should be clearly stated in the award (which in this case, of course, would be signed by the two surveyors) that he has been selected.

I am inclined to think that if these necessary steps were always taken, as they certainly should be, and a proper award made before any work were done to a party structure, and before, in fact, the structure were touched, an immense amount of difficulty might be saved, and it would be a rare occurrence to have recourse to the law courts. Where litigation has arisen it will almost invariably be found that some link in the chain of this procedure has been omitted.

In the case of the *Standard Bank of Africa v. Stokes* the judge said that "The Act gave the three surveyors power to determine the time and manner of doing any work, and it would be reducing the Act to an absurdity to suppose that the building owner had a right to proceed with the work until they had so determined."

In certain cases not specially provided for here—namely, where a surveyor dies or refuses to act, &c.—section xxi. of the Amendment Act of 1882 gives the necessary procedure in the appointment of another surveyor.

8. The award by such one, three, or any two of them is conclusive, or must be appealed against within fourteen days of delivery.

9. If either owner fails to appoint a surveyor for ten days after notice has been given to make such appointment, the party giving notice may appoint.

Rules 11 and 12 relate what appellant from award is to do.

Section lxxxvi. gives power to building owner to enter premises to effect works (of course only when entitled to do so under an award).

Section lxxxvii. deals with security to be given by building owner if required.

Section lxxxix. Account of expenses must be delivered to adjoining owner within one month of completion.

Section xc. Adjoining owner may appeal against account within one month of its delivery.

Section xci. If adjoining owner does not appeal within one month, building owner can recover as a debt.

Section xcii. Until adjoining owner pays, the building owner is sole possessor of such structure.

Section xciii. Where building owner has incurred expenses, adjoining owner liable as a debt.

Section xciv. is an important one. It enacts that where a building owner fails to do anything, upon condition of doing which his right to execute certain works is hereby limited to avenge or to make good damage within a reasonable time, he incurs a penalty not exceeding 20*l.* for each day during which such failure continues.

Section xcvi. Consent how given on behalf of persons under disability.

Section xcvi. Consent how given on behalf of a person not to be found.

Part IV. deals with payment of expenses by owners.

5. *The proposed Bill to be introduced by the London County Council, so far as it affects the rights of Building and Adjoining Owners.*

A separate evening might very well be set apart for the discussion of this bill, and to-night I shall only have time to touch upon one or two points.

By section xlv., a wall shall be deemed a party wall, though part only of it is actually used as a party wall, in the following cases:—

(a) When a wall is after the commencement of this Act built as a party wall in any part.

(b) Where a wall built before or after the commencement of this Act becomes after the commencement of this Act a party wall in any part.

Practically this means that a person, by erecting surreptitiously a w.c. against his neighbour's wall, converts the whole of it into a party wall, or at any rate for 10 feet above the lower building. Nor is there any provision to prevent any openings above that height being made in a new wall over an adjoining owner's building. This, I think, should be guarded against.

Rights of Building and Adjoining Owners.

Section lxvii. is a new section altogether.

Rule 1 reads:—If the building owner desires to build a party wall on the line of junction he may serve notice thereof on the adjoining owner.

Rule 2.—If the adjoining owner consents to the building of a party wall there (that is, on the line of junction), the wall shall be built half on the ground of each of the two owners.

This might be unfair. Suppose the adjoining owner wants a wall 10 feet high, and the building owner 80 feet high, the wall must either be half on each owner's ground (which would be unfair to the adjoining owner), or there must be two external walls.

Rule 3 is somewhat ambiguous. It reads:—"The expense of the building of the party wall shall be from time to time borne by the two owners in proportion to the superficial extent thereof which they respectively from time to time make use of."

Rule 4 says:—If the adjoining owner does not consent to the building of a party wall, the building owner must build external wall on his own ground.

Rule 5.—If the building owner wishes to build an external wall on his own ground, he may serve notice thereof on the adjoining owner.

Rule 6 reads:—"Where, in either of the cases aforesaid the building owner proceeds to build an external wall on his own ground, he shall have a right at his own expense, at any time after the expiration of one month from the service of the notice, to place on the ground of the adjoining owner the projecting footings of the external wall, with concrete or other solid substructure thereunder, making compensation to the adjoining owner or occupier for any damage occasioned thereby."

This might be hard on the adjoining owner. Suppose adjoining owner has a one-storey building only, building owner might want wall 80 feet high, and could put his footings and concrete right in adjoining owner's room, as sketch.

And further it reads:—"Where an external wall is built against another external wall, or against a party wall, it shall be lawful for the district surveyor to allow the footing of the side next such wall to be omitted." By this it would be lawful to erect a wall 80 feet or more in height without footings, if an external wall 10 feet or even less were against it.

By section lxxv., rule 1.—One month's notice will have to be given for a party fence-wall, and two months' notice served on the adjoining owner and occupier for a party wall or party structure, instead of as now, three.

By Rule 2.—The building owner must hoard in the adjoining owner's building where wall is taken down.

Rule 4.—A notice shall not be any good unless the work is begun within six months after the service thereof. These are good regulations and wanting in the present Act.

Rule 8 of section lxxv. makes it imperative on the two surveyors to select a third to act as "umpire," and an award must be made either by the one surveyor (that is, in the case where building owner and adjoining owner agree to have only one surveyor), or the three surveyors, or by the umpire of them, so that if a difference arises the two surveyors must call in the umpire, and the two cannot make the award without the "umpire," as they can in the present Act.

This, of course, would entail more expense and often occupy more time, as now so often differences are settled by the two surveyors agreeing without having recourse to the third surveyor. I can see one or two difficulties that might arise by this arrangement; suppose the two surveyors did not agree with the umpire as to his costs, they—the two—could not make the award without the umpire, but the umpire would have the power to make the award alone, though the difference might be a very trivial one, and he could put his costs down at anything he liked.

The present arrangement has been found to work well; why alter it?

Section lxxviii. is a new section and deals with a case where a building owner intends to build within 10 feet of, and excavate lower than the adjoining owner's building.

Two months' notice of this shall be given to the adjoining owner. Building owner shall underpin or otherwise strengthen the adjoining owner's wall if required, but the expense of this is not included in the expenses to be borne by the building owner, though by rule 3 the building owner would have to compensate him for any inconvenience, loss or damage.

Rule 2.—If the adjoining owner or occupier gives notice that he disputes the necessity of the underpinning, a difference arises. This section will certainly place a rather hard and, I am inclined to think, unnecessary additional restriction on the building owners. The section dealing with expenses remains nearly as at present, except that two clauses are inserted for party fence-walls. The last clause of this part of the Bill is an important one, and I will read it:—"Nothing in this Act shall authorise any interference with an easement of light or other easements in or relating to a party wall, or take away, abridge or prejudicially affect any right of any person to preserve or restore any light or other thing in or connected with a party wall in case of the party wall being pulled down or rebuilt." This is a good and necessary clause.

OFFICIAL ARCHITECTURE IN AMERICA.*

IT is perhaps as much a political as an æsthetic reflection that, while public architecture in every other country fairly represents the best that the architects can do, in the United States it is very apt to represent the worst. There is at any rate no doubt about the fact. The professional goal of a practitioner of architecture in France—the goal which he sets before himself even at the beginning of his studies, and to which his studies are largely directed—is an appointment to be a Government architect. The centralised system of administration that survives all political changes makes the public architect an official function. Not only would the notion of employing an obscure architect to design a public building be resented by the public, but the execution of such a notion would be quite impossible. An architect must prove his ability according to the tests imposed by a professional education which is itself the care of the State, and also in private practice, before he can be so much as considered when there is a question of designing an important public building. The result is that, whatever may be thought of a new public building in Paris or in the provinces, there is never any doubt that it represents what the official hierarchy and the public alike consider the acme of professional attainment. Throughout continental Europe the rule is the same. In the British Islands, where the popular agreement that the arts will flourish best if the Government leaves them alone is largely the expression of a popular indifference whether they flourish or not, it is still

* An essay by Mr. Montgomery Schuyler, published in the *Engineering Magazine* for February.

true that the public architecture represents the best that the architects can do. From the time of Sir Christopher Wren to that of Sir Gilbert Scott the architects who have stood highest with the cultivated part of the public have been the architects chosen to do the Government work.

Westminster Palace is not an object of unmixed national pride, but Sir Charles Barry was at the head of the profession when it was designed, and, although in the light of what has been learned and done since it is rather a queer example of secular Gothic, it embodies as much of Gothic as was understood at that time among the leading architects, who resented and resisted the revival that was really imposed upon the profession by the public, and of which the origin was in part archaeological and in part ecclesiastical.

Undoubtedly the Gothic revival is not seen at its best in public buildings. It was begun by the Houses of Parliament, and it may be said to have been definitely closed, so far as secular work goes, by the erection of the Law Courts. The world is pretty well agreed that this latter building is a failure, both practically and artistically, and yet it was certainly not a failure for lack of pains—of far more pains than have ever been taken to secure in America a work of official architecture that should be the best that the architects could do. The competition for the Law Courts was a model of liberality and consideration. The invited competitors were the architects most in view, and the architect finally chosen was one of the most eminent of these. Moreover, it was one of the most interesting architectural competitions that has ever been held, and Mr. Burges's design was probably the very finest achievement of the Gothic revival, and had more influence upon the practice of his contemporaries than any modern building actually erected in England, having very evidently supplied the architectural motive for buildings on both sides of the Atlantic. It is noteworthy, however, that Lord Palmerston actually interposed to dictate the style of a public building, against the protest of its architect, and insisted that he would not have Gothic, but would have "something light and airy." It would have been out of the question for such a problem to be decided in any other country than England, always excepting our own, by a layman's freak, and this official freak was especially deplorable because Sir Gilbert Scott, if he had been left to his own devices in the design of the Foreign Office, might very possibly have produced a more worthy monument of the Gothic revival than any that it has left in the shape of a public building. Since the close of the Gothic revival no public building of the first importance has been erected in England.

If such a building were projected, however, an attempt would be made, we may be sure, to make it worthy of the best that the nation could do. There would not be that complete indifference whether it was good or bad that characterises our own productions in this kind. Undoubtedly during the past quarter of a century the Government of the United States has erected more buildings for its own use than the Government of any other country in the world. It has spent more money upon architecture and got less architecture for its money than any nation of past or present times. The waste is appalling when we come to think of what might have been done with this money if the standard of official architecture had been kept up to the standard even of the best private building. If we had had a bureau of public works with a succession of able and responsible architects at the head of it, it would have had by this time a tradition of its own that would have been of immense value to the architecture of the country. For the national building in any town is sure to be a conspicuous building. With the system now firmly established in Congress of log-rolling for building appropriations, and of erecting in villages public buildings suitable, in scale and cost for the cities these villages are expected to become, it is apt to be the most conspicuous building, and the pioneer and model of edifices built of permanent materials. And what models they have been, these public buildings, from the time of Mullett and earlier. With one or two distinguished exceptions the supervising architects have not been men of high professional standing, although they have been quite as eminent as could have been expected from the conditions of their service. Indeed, the status of the supervising architect is a measure of the legislative, and consequently of the popular, appreciation of architecture. That functionary has the spending of far more money than any private practitioner. He has the supervision of ten times as much work as any conscientious private practitioner would consent to be responsible for. Yet his status is that of a clerk and his compensation such as would not tempt an established practitioner, unless such a practitioner were sustained by professional enthusiasm and willing to make sacrifices for his art. Even so his sacrifice would be vain. A busy architect in private practice has far too little time to devote to the art of architecture. The supervising architect of the Treasury, if he discharges the responsibilities his office imposes upon him in other respects, can have none at all.

The increase of these responsibilities with the increase of the public building has put it quite out of the question that the supervising architect could in any proper sense design any of

the buildings he is directed to erect. This was the sufficient motive and justification of the bill providing for the opening of the design of public buildings to competition, a bill to which many architects, having the honour of their profession and the architectural credit of the Government at heart, devoted much unselfish labour. But the measure was shorn of nearly all its purpose and effect by the amendment that was foisted upon it forbidding the Secretary of the Treasury to pay for the services of any of the architects whom he was authorised to select as competitors, except the architect whose design was chosen for execution. Nothing could show a more complete misapprehension of the purpose of the bill than this amendment. It is true that the architects at large are responsible for this misapprehension. So long as men who call themselves architects can be got to do work for nothing and submit their designs as chances in a lottery, so long will men who are unaware that there are architects and architects, and that the work of some is more desirable than the work of others, be unwilling to pay for what it seems to them they can get for nothing. Architects of repute will sometimes consent, whether or not they are well advised in consenting, to enter open competition for public works, when they are assured of competent judgment upon their designs, and when the prizes are numerous enough and large enough to give a reasonable chance that they may be reimbursed for their actual outlay. But it is perfectly well known to private builders that architects of repute will not submit their designs to lay judgment unless they are paid for preparing them. What the Government of the United States refuses to do every corporation that projects a new office building, and that desires to have a choice of designs, finds it necessary to do. It may be as well, with the law that was framed to bring about a better state of things thus shorn of its force, that the Secretary of the Treasury should have declined to avail himself of the permission the law gives him to invite people to do work for the Government for which he is forbidden to pay; and should prefer to go on entrusting the public architecture to the system that has already left it far behind private building.

How far it is behind may be judged from the comparative exhibit of the two that was made at the World's Fair. It was a most impressive object-lesson, the comparison between the buildings reared by private enterprise, under an exceptionally fortunate direction, it is true, and the building erected by the Government to represent it to its own citizens and to foreign visitors. If the American people were not capable of learning the lesson there put before them, if even a representative or a senator could not see the difference, then it is quite idle to hope for any change for the better in our official architecture. While the practice of architecture, as shown in the academic exercises that a singular good fortune enabled to be actually reared in Jackson Park, has been steadily advancing in the country at large, the official architecture of the country has been as steadily deteriorating, until now it has relapsed into positive barbarism. It was not so in colonial times, or in the early days of the Republic. Then the public buildings were the best that we could do. The old "Federal Hall" in Wall Street impressed a British visitor of just a century ago as the only edifice in New York worth looking at, and within a generation afterwards such public buildings as the City Hall of New York and the State House of Boston showed that the State understood and desired the best that its citizens could do. Nay, take as a standard of comparison the public buildings at Washington, and draw the line at the middle of the century. With all their defects and inequalities, the public buildings erected before that date did really represent the highest architectural attainment that was available at the time. Who that has seen both Washington and the World's Fair, even if he be a member of Congress, can fail to perceive that it would be for the credit of the country if the existing public buildings at the capital were to be replaced by structures erected from the designs of those architects whose work was shown at Chicago? We are not saying that the formal and academic style that is common to the public buildings and the exhibition buildings would be desirable for adoption in permanent and representative buildings of our country and our time. But precisely because their classicism is common to both a just comparison can be instituted, and the comparison is at every point favourable to the later designers. There is juster proportion, more dignity, more breadth, more stateliness, more repose in the general composition of their works, as there is more refinement, more purity, a nicer adjustment and scale in the detail. In a word, they show more architectural quality. On the other hand, let anybody figure to himself a new group of public buildings at the capital by the author of the Government building at the Columbian exhibition. The imagination of the untutored observer must recoil from such a prospect. For stateliness it shows pretension; for distinction, commonness; for repose, restlessness; for elegance, crudity. It is in this comparison the work of barbarians impudently confronting the monuments of a high civilisation. Nay, there is scarcely a comparison that can be made upon the Fair grounds, except

with the very crudest and most illiterate of the State buildings, and not with more than two or three even of them, by which the Government of the United States does not appear to disadvantage.

And yet, under the system that has grown up with the acquiescence of our lawmakers, it is not to the architects of the Court of Honour but to the architect of the Government building that we should turn in case it were necessary to add to the public buildings of the capital. The deterioration in our official architecture has been at least as progressive as the advance in our private architecture. The latest of the great public buildings, happily, is the building of the State, War and Navy departments, one of the works of Mr. Mullett. It argued a deep architectural insensibility to add this fussy and multifarious structure to the collection of simple, quiet and decorous public buildings at Washington. And yet itself becomes respectable and almost distinguished when it is compared with the Government's exhibit of its official architecture at the World's Fair. The protest that the sensitive visitor to Washington feels called upon to enter against the intruder upon its peace, the shade of Mullett would be entitled to repeat against bestowing upon his work the neighbourhood of a newer building by the author of the Government building at the World's Fair.

And consider that the quality of the Government building at the World's Fair is the architectural quality of the work that the Government is doing all over the country, and spending more money upon year after year than was ever spent upon architecture by a single nation. There is much to be said about the official architecture of our lesser political divisions—of States and municipalities. The rule is that no official person cares about it or takes thought for it, and the rule consequently is that it is pretty bad. But the rule is mitigated by occasional exceptions. In any case, and if there were no exceptions, the mischief that is done by the workings of officialism in the architecture of States and municipalities would sink into insignificance compared with the mischief that is done in the architecture of the national Government. We are spending enormously and profusely every year to pervert the perceptions of the people of the United States respecting the art of architecture. What can the beneficent influence of a group of monumental buildings in transitory plaster, of which a fraction of the people have had the vision for a day or two, do to counteract the malign influence of permanent buildings, in the sight of which the people pass their lives?—an influence that reaches into every quarter of the land and into every congressional district that exults in an enterprising member who insists that his constituency shall have its share of what is going.



The Royal School of Art Needlework.

SIR,—May I call attention to a meeting to be held at the Imperial Institute on Wednesday, February 14, at 3 P.M., to submit the outlines of a scheme I have now in hand for the establishment of a self-supporting "school" of applied "design" for women in connection with the Royal School of Art Needlework, and in which I hope to enlist your hearty sympathy.

Mrs. Dunlop Hopkins, a lady who has most successfully founded and carried on such a school in America, and who has most kindly offered me her assistance in establishing a similar school in England, will address the meeting on the subject.

Twenty-two years' experience as President of the Royal School of Art Needlework teaches me that there exists in the above scheme a wide and, in this country, hitherto untried field for the further development of remunerative work for women.

A brief statement of the main features of the undertaking will be found below.—Your obedient servant,

HELENA,

Princess Christian of Schleswig-Holstein,
Princess of Great Britain and Ireland, President
of the Royal School of Art Needlework.

Cumberland Lodge: February.

The proposal is to found a school where women may learn from practical teachers to design for various branches of decorative art, beginning with good draughtsmanship, in which each student will pass before going further to study. Secondly, the various styles of architecture, to which all decorative art is

more or less related; and with architecture will be connected the study of historic ornament.

Some of the heads of the special studies will be:—

1. The application of design to wall decorations, viz. wall-papers, silk tapestries, needlework, chintzes, frescoes, &c.
2. The application of design to floor decorations, viz. pavements, mosaics, rugs, carpets, linoleum, &c.
3. The application of design connected with architectural study, more especially to interior house decorations and fittings.
4. The application of design to various branches of metal-work, ornamental plaster-work and modelling, glass painting, furniture needlework, book illustrations, book covers, &c.

It is ultimately intended to form a library and museum in connection with the school.

It is estimated that the fees paid by the students will amply cover all expenses of management and tuition.

The sale of designs will be for the benefit of each designer, who will thereby receive the reward of individual talent and industry, even during the continuance of her tuition.

[The above letter was not received in time for publication last week.]

GENERAL.

The Society of Painters in Water-Colours have elected Mr. Herkomer, R.A., Mr. Waterlow, A.R.A., and Mr. Lionel Smythe as members, and Mr. J. R. Weguelin as Associate.

The Annual Report of the Fitzwilliam Museum Syndicate states that the number of visitors during the past year was 41,728, and to the Museum of Archaeology 5,480. Mr. Rhodes James has been appointed director in the place of Professor Middleton. Fifteen early Italian pictures were purchased from the collection of Mr. Charles Butler, of Warren Wood, Hatfield, and some were formerly in the Toscanelli collection at Pisa. The most important work is a panel of the Virgin and Child with Saints, by Cosimo Roselli.

Messrs. C. O. Ellison & Son, of Liverpool, have been appointed architects for the additions to the North Wales Lunatic Asylum, which will cost 60,000*l*. Nineteen designs were submitted; out of them four were selected, and the authors of the three which were not adopted are Messrs. Aspinall & Smith, Blackburn; Mr. J. D. Mould, Manchester; and Messrs. Stanger & Stanger, Wolverhampton.

The Surveyors' Institution will meet on Monday, the 19th, when the adjourned discussion on the paper read by Mr. H. Blackburn at the last meeting, on the "London Streets and Buildings Bill, 1894," of the London County Council, will be resumed.

Mr. R. H. Tweddell will read a paper on "Forging by Hydraulic Pressure" at the meeting of the Institution of Civil Engineers on the 20th inst.

Mr. Hugh Stannus will on Monday next, at the Society of Arts, commence a series of Cantor lectures on "The Decorative Treatment of Artificial Foliage."

Mr. R. Hedley, on Wednesday, the 14th inst., read a paper on "Wood-Carving" at the meeting of the Northern Architectural Association, Newcastle-on-Tyne.

The Death is announced of Mr. John Alison, city surveyor of Manchester, to which post he was appointed nine years ago.

Mr. S. E. Purchas, city surveyor of Worcester, died on Monday at the advanced age of seventy years. He commenced practice as a surveyor in Worcester in 1848, and in 1856 he was appointed city surveyor.

Sir A. W. Blomfield, A.R.A., will be called in to advise the Dean and Chapter, Chester, with respect to the damage wrought at the cathedral by the gale. The pinnacle which was blown down stood at the north-east corner of the north transept. It alighted on the outer roof of the chapter-house, smashing through it, and seriously damaging and straining the vaulted inner roof.

Mr. A. P. I. Cotterell has been instructed to prepare plans for the sewerage of the Ashley Down Sewerage District.

Messrs. Bruce & Hay, architects, Glasgow, have prepared plans for the proposed co-operative seaside homes at Seamill, which will shortly be commenced.

Mr. J. W. Blakey will read a paper, entitled "A Few Notes on Quantities and Specifications," at the meeting of the Liverpool Architectural Society on Monday, the 19th inst.

At the Meeting of the Royal Scottish Society of Arts, Edinburgh, Mr. J. N. Miller, Joppa, described a gasalier water feeder, the object of which, he explained, was to enable a person whilst standing on the floor to fill the cup of a water-sliding or telescopic gasalier with the water requisite to prevent the escape of gas.

The Architect.

THE WEEK.

SOME months back we called attention to the remarkable case relating to Messrs. SHOOLBRED'S premises in Tottenham Court Road, in which the result depended on whether fireproof flooring could be considered as equivalent to the division prescribed in the Building Acts for separating areas of 216,000 cubic feet, or in other words, whether security could not be attained by a horizontal layer as well as by a vertical one. Messrs. SHOOLBRED had instructed Messrs. HOLLAND & HANNEN to alter the premises, including the addition of a new building 87 feet high, with eight floors. The basement was to be used for packing, the ground floor as a shop, and the remainder of the new building was to be devoted to dining-rooms, kitchens, &c., for the benefit of the *employés*, or in other words it formed a sort of club. The floor under the kitchens was constructed of iron and steel joists with concrete. The total contents of building, including staircase, was 289,456 cubic feet, the part above the concrete floor being 62,087 cubic feet, or about a fifth of the whole. Mr. WALLEN, the district surveyor, gave notice that the limit of 216,000 cubic feet must be observed, and therefore party-walls were to be constructed. The builders and owners, on the other hand, contended that the building was not a warehouse within the purview of the Building Acts, and moreover the concrete floor, which cut off the two upper storeys, was equivalent to a party-wall. The magistrate having adopted the views of the district surveyor, the builders appealed. The case came before Mr. Justice MATHEW and Mr. Justice CAVE on Tuesday, and the magistrate's decision was upheld. When the Building Acts were drafted party-walls were considered as the most efficient protection against the spread of fire, for what was sought was not the protection of the property of an individual, which it was his own interest to look after, but the restriction of the flames to the place in which they arose. At the same time the upward tendency of a fire should not be overlooked. The introduction of party-walls will not make Messrs. SHOOLBRED'S premises any safer than they are at present, but the people around may probably be more satisfied when they know that in the event of fire breaking out on any of the floors their risks are minimised. The decision in the Queen's Bench Division ought to bring about a needed alteration of the Building Acts, but as inside and outside law courts there is much faith in the resistance of a party-wall—although it is not always borne out by experience—we suppose no amendment is likely to be approved which would diminish the prestige of so constitutional a safeguard.

A SECOND edition of Mr. J. NEWMAN'S "Notes on Concrete and Works in Concrete" has been published by Messrs. SPON. The title is so modest there is a risk that the book may be undervalued. In the pages we have not only the benefit of English experience in dealing with the material, but learn also what Germans and Americans have realised. Men who have repeatedly employed Portland cement will be the first to acknowledge that the pages contain much information that is both useful and novel. The following will suggest the kind of "Notes" which abound:—"The experiments of Mr. COLSON on beams and flat arches of concrete showed the importance and necessity of guarding against the possibility of lateral movement in the slightest degree in the supporting girders of a floor, as by so doing the supporting power of a beam is materially increased, and before loading twenty-eight days at the least should be allowed to elapse, as at fourteen days a beam will give way that will stand at twenty-one and twenty-eight days, and at the latter date when loaded. He also found that a straight beam of concrete, firmly supported at the ends, of 8 feet 3 inches span, with $4\frac{1}{2}$ inches bearing upon each pier and 9 inches in depth, if made in arch form with $4\frac{1}{2}$ inches rise at the centre was as strong as a straight beam, although a curved strip of concrete, rising at the pier on

each side to a height at the centre of $4\frac{1}{2}$ inches, was taken away; always provided that the curved beam is firmly confined at the ends." Mr. NEWTON notices among other recent systems "The Monier," in which wrought-iron netting has been used to equalise the compressive and tensional strength of concrete. It is considered "that the wrought-iron netting can be so introduced that the tensional stresses are taken by the wrought-iron, and the compressive strains by the concrete, thus straining the materials to the best advantage. Some tests made in the building yard of the Royal Hungarian Government at Budapest showed that an arch constructed of the best Portland cement concrete would only sustain one-fifth of the load of an arch constructed on the Monier system."

At the meeting of the Llandudno Improvement Commissioners on Wednesday, a report of the finance committee was read which referred to the proposal for erecting municipal buildings at an estimated cost of 10,000*l.*; annual repayment of principal and interest combined in thirty years at $3\frac{1}{2}$ per cent., equal to 2*d.* in the pound. The committee had taken into consideration the probable revenue to be derived from the letting of the rooms in the municipal buildings, and were of opinion that the Commissioners would be justified in carrying out the recommendation of the municipal buildings committee. Therefore the Board was recommended to proceed according to the suggestions of the committee. One of the Commissioners denied that a town-hall was at present needed, and maintained that the Commissioners might with greater propriety devote their attention to improvements of a more urgent character. There were so many demands upon the resources of the Commissioners at present that they must be careful that at an early date they did not land the town in a rate of 5*s.* 6*d.* The Chairman said the Board were not discussing the question of erecting a hall, but simply whether they should not offer premiums for designs. If decisive steps were not promptly taken there was a possibility that the proposed site might be utilised for another purpose. There were nine votes in favour of the adoption of the report and seven against it.

HOWEVER inequitable the arbitration clause may appear sometimes to contractors, it cannot be too generally known that the courts are bound to uphold the clause unless there are most extraordinary circumstances to support a different view. Yet scarcely a year passes without some attempts being made to persuade judges to disregard the arbitration clause. A case of the kind came before the Queen's Bench Division on Wednesday. Messrs. ECKERSLEY & Co. entered into a contract amounting to about 60,000*l.* with the Mersey Docks and Harbour Board. The common arbitration clause appeared in the deed. A heavy claim was made by the contractors for damages caused by delay and the undue interference of the Board's officers, and an action was commenced. The Board claimed that all disputes and differences were to be referred to the engineer, and Mr. Justice GRANTHAM, before whom the case came in chambers, made an order staying all proceedings. Messrs. ECKERSLEY appealed on the ground that the great part of their claim was outside the contract altogether; and secondly, that even if the claim were held to be within the arbitration clause, it would not be right to refer the matter in dispute to the engineer named therein, inasmuch as it could be shown that he was not a fit and proper person to deal with the dispute. The judges made short work of the argument, for if the engineer was not a fit and proper person, why was a contract entered into in which he was to be chief agent? and to say a claim was outside a contract did not say much for the prudence of the contractors. The decision is decisive, but we may anticipate that it will not diminish the number of attempts to remove the clause which is the most characteristic in English agreements about works.

THE edition of "Spon's Architects' and Builders' Price Book" for 1894 has appeared. In addition to the usual information (which forms an epitome of building), the applications of electricity to lighting, bells, &c., are treated skillfully.

SCANDINAVIAN TIMBER WORK.

ALTHOUGH DAHL revealed the existence of the Norwegian timber churches by his "Denkmäler einer sehr ausgebildeten Holzbaukunst aus den früheren Jahrhunderten in den inneren Landschaften Norwegens," which was published about sixty years ago, it cannot be said that the subject excited much interest except among a few architects. Norway was then far more inaccessible than Matabeleland is at present. When, however, from the systematic study of German literature it became evident that the old legends which inspired so much poetry were derived from the North, it could not fail that Denmark, Norway and Iceland should assume unexpected importance. The search after the affinities of languages produced a similar result. It was concluded also that many of the peculiarities of the Germanic race corresponded with those which were exhibited in the North. There was besides a fascination in the lives of the old rovers for men who have to exist in an age when so many things tend to convert them into machines. All these causes combined to turn the attention of people towards Norway as if it were the land of their ancestors, and no time was lost in creating facilities for those who desired to see it with bodily as well as mental vision. Among all who made the journey few were disappointed.

As a consequence, a genuine interest in the old timber construction has been created, especially in Germany. The present Emperor, who wishes to be taken as the representative of the Heldengeist, has given the best of proofs that he is able to admire the work of the Vikings as well as of the Italians. Naturally many loyal subjects are disposed to be guided by the Imperial example. We have even seen a proposal that the Stabkirchen should be accepted as affording the freshest and most suitable elements for the creation of a new and national style. Everyone who knows the excess to which supererogatory accuracy is carried in the offices of German architects will understand why there should be a yearning for anything that will admit of the exercise of a little liberty. The publication of "De Norske Stavkirker: studier over deres system, aprindelse og historiske udvikling," by L. DIETRICHSON, of Christiania, has whetted the desire to revive the old system of construction.

That timber should be the material most generally employed for the churches and other buildings was inevitable. Forests were among the bequests with which Time had enriched not only Norway but most parts of northern Europe. It would be unwise to seek after stone when timber was always within reach. Besides, the Northman's home was a boat, and what served for its construction would be considered as no less suitable for the grandest and noblest of buildings. He wished to have his associations with the sea renewed by whatever was around him on land. Nor was he in death divided from the floating home which was the dearest and safest for him. Sometimes the chieftain's corpse was sent adrift in his boat; when he was buried on the shore it was placed above his remains. Hence it has been said that "the ship tumulus is distinguished by all Scandinavian antiquaries as distinct from the round heaps raised over stone coffins or other receptacles."

Every boat exemplifies constructive skill, or a calculated amount and disposition of materials in order to resist the strains arising from the force of wind and water. The Northman esteemed that skill as too important for universal application. He reserved it, as far as can be known, for the building of churches. His own dwelling and those of his retainers were not framed work; they corresponded to some extent with the log-houses of America, which depend for safety on the inertia of the materials. Mr. SAMUEL LAING, who was one of the earliest who aided in creating a love for the old Norse ways, gives an account of one of the dwellings in Laurgaard, which would serve for those of earlier times. He says:—

The room I occupy here is detached from the family house of the farm. It consists of four walls, each composed of ten logs, roughly squared with the axe and the edges chipped off so as to make them octagonal. They are laid one upon the other with a layer of moss between each, which keeps the interstices quite tight. The logs forming the side walls are notched above and below, and those forming the gable walls so as to correspond; thus the head of each log touches the one below it at the corners, which are as tight and strong as any part of the building. Each log may be 12 inches square, so that the walls of my apartment are a foot thick and 10 feet high. The soles

and sides of the windows and the corners are lined with boards; and in good houses the whole, I understand, is boarded or panelled inside and out, but I am in one of the dwellings of the middle or labouring class. There are three latticed windows in the room, which is 18 feet square, and sixteen panes of coarse glass in each window. The floor and ceiling are boarded; the former raised from the earth by a stone wall a foot or two high, according to the level, and rough-cast with lime. The roof has a pitch of about 2 feet; it is closely boarded over on the outside, and the boards there are coated with birch-bark, peeled off in large flakes. Above this is laid earth, about 3 inches deep; retained by a ledge of the same depth along the bottom of the roof. A crop of grass or of moss growing on this earth makes it compact. Many houses are roofed with tiles and some with slates. The joiner-work in the window-frames, doors, floors, &c., is very rough and ill-finished, but all is wind and water-tight. I give this minute description because one hears so much of the log huts of America, and this is probably their mother country. It is very different, too, from the wooden tenement of the English labourer, which is but the skin of a house, having only the boarding outside and inside upon a hollow framework, without the solid log in the middle between him and the cold. The cost of such a house with two rooms below and two above does not usually exceed 50 dols., wood and workmanship included. As the wood is on the farm and any man can do the work, the number of houses about one steading is wonderful. I have counted eighteen. There is a distinct one for everything, so as, in case of fire, not to have all under one roof.

The large area covered by farm buildings, owing to the custom of assigning each of them mainly to one purpose, is remarkable, and appears to be a survival of the oldest system of planning in the country. The Northman in Norway or Iceland was a different being to his descendant the Norman in France and England. He dare not assume and did not attempt to pose as a superior being; *primus inter pares* was the most that could be said of him by the freemen. In the hall, which was built of logs, his chair was in one place, to which usage had attached some respect. Like most of the other structures the hall was a single storey, and until the eleventh century it must have been smoky, for it was not the custom to have an opening in the roof. The remainder of the buildings were no less simple in construction.

The churches were apparently in a different style. It is well known that the Northmen were converted with difficulty by the Christian missionaries, and at a rather late period, but as soon as they adopted the new doctrines they testified the strength of their belief with characteristic heartiness. For the churches they employed timber, and as the treatment of the material varies, Herr DIETRICHSON has been able to divide them into three classes, viz. (1) Archaic, A.D. 1000-1150; (2) Romanesque, A.D. 1150-1250; (3) Gothic, 1250-1500. As after the Reformation stone was preferred, the old churches became obsolete, both on account of their style and the rites which had been practised in them. They were allowed to fall into ruin, and at the present time there are, we believe, only about thirty survivors. They are so curious that no cost is spared to preserve them.

It is always risky to seek out architectural analogies; but if boats could be imagined as having straight instead of curved sides, it might be supposed that the exterior of one of the old churches was suggested by the appearance of boats that had been placed in a pile. Or if that view be inexact, it might be said that the Norwegian builders considered the roof was the strongest part of a building, and therefore they encased the churches with that kind of protection. The vertical sides are almost concealed in some cases by the expanses of roofing. The advantage of having as large an area of sloping surface as is possible is manifest. In the first place it enabled water and snow to pass away quickly, without causing much detriment to the timber. With a series of roofs the spans were diminished, and it was not necessary to have massive timbering, unless in the nave. The Scandinavian builders understood the limitation of their material as well as of their power, and they avoided transepts in their timber churches as steadfastly as in their ships. The latter circumstance is the more remarkable, because Southern precedents must have been often suggested to the builders by the clergy. The cutting of timber struts into arched forms, which was without any constructional advantage, was evidently intended to mimic the masonry arches in other lands.

The system of construction must have been inspired by the ship carpenters. In the nave each of the columns is like "the mast of some great ammirall," and seems competent to withstand very great strains. In the upper parts,

which correspond with the clerestory and triforium of masonry churches, they are stoutly braced. The efficiency of the timbering is evident from the absence of distortion in the surviving examples. The lines are not always as true as when they were set up, but the changes are due to the wear and tear of ages rather than to the overcoming of the fibres through the operation of the weight of any part of the building. As far as can be judged, the old carpenters did not seek the aid of metal bands to supplement the strength of the jointing. They depended solely on wood.

The woodwork, beside its constructive interest, is also worth attention, on account of the weird power that is seen in the carving of so many of the pieces. Moreover, the ornament enables questions to be raised about the date of the buildings. On this subject there is a valuable article in the last number of *L'Art* by M. C. ENLART. The author considers that the Scandinavian style exercised influence on the Norman monuments in France of the twelfth century; but he also believes that much of what is seen in Norway was derived from England. English inspiration is found in Gothic as well as in Romanesque buildings. Of course, we must remember that the intercourse between England and the North was very close during a long period. Moreover, as Christianity had been for centuries established in these islands, there would be a supply of missionaries available for the conversion of the Northmen. There is, undoubtedly, some affinity between the interlaced ornament that is found in Scandinavia and what is to be seen in Ireland and Scotland as well as in England. All may have been derived from Romanesque originals. It must be admitted, however, that the northern details have a sombre power which is not seen in the examples that are to be found among us. The dragons are not mere decorative compositions. They correspond with the terrible things that are mentioned in the Sagas and the legends. They might have been produced by men who knew what it was "to wrestle with the sea-serpent upon cerulean sands." The Anglo-Saxon and Celtic lines are often mechanical, but the serpentine forms of the Scandinavians are imbued with life and venom. If, therefore, the northern ornament was derived from Britain, it was translated into something that surpassed the original.

M. ENLART maintains that during the Merovingian and Carolingian periods there was little difference between Scandinavian art and the art that prevailed in the greater part of Europe. He also holds that from the eleventh to the fifteenth century northern art was affected by the influence of England, France and Germany, and that before the year 1100 there is no example to prove the existence of indigenous art in Norway, and that the greater number of the examples are not to be dated by any characteristic of the style.

The conclusions will appear startling to many, but there is a good deal to be said in support of them. Those people who are enthralled by the manliness that is revealed in the Sagas, and which was exhibited in actions that are comparable to those described by HOMER, should remember that literature and art are not always seen on the same plane. Certainly Germany can find more rational exemplars of constructive style than the timber buildings of Norway.

LONDON STREETS AND BUILDINGS BILL.*

(Concluded from last week.)

SECTION 31 is an astonishing one, and deals with the re-erection of domestic buildings in narrow streets, and proposes that should a building be re-erected and it exceeds 40 feet high, the front wall is to be set back 20 feet from the centre of the road, and if less than 40 feet in height then to such a distance as will be not less than half the height of the re-erected building, presuming that the building plots upon such a street belonged to different owners each wanting his own particular requirements. This section would impart a pleasing variety not only to the fronts but also to the skyline, as what with the setting back in front and the diagonal line coming up from the rear, the unfortunate building owner would scarcely know where he was; but as some little consolation he may enclose the piece of land which such setting back leaves to him with a fence not exceeding 7 feet in height.

However desirable it may be to get more air-space in old streets, I do not think this would attain that object, as when it was found that old buildings could not be pulled down and re-erected without being set back, every effort would be made to prop and patch up old and tumble-down premises, which would be prejudicial to the interests of good and sound construction.

Section 33 is entirely new, and deals with existing buildings which do not comply with the provisions of the new Bill. Should the owner desire to rebuild them he will be unable to do so without first having correct plans and sections taken of them to be certified by the district surveyor, and then the rebuilding is not to further transgress the new rules except with the consent of the Council.

This, again, I am afraid will make an owner think twice before he reconstructs his old premises, as, what with the chance under section 31 of having to set back 20 feet from the centre of the road, and then being able only to reconstruct his premises as they were before, will make him rather bear the ills he has than fly to others that he knows not of.

The prospect for the district surveyor is not inviting, as he will be continually getting himself into hot water unless he is very careful, and will have to be constantly certifying plans for old buildings which he must verify; and should a building fall or be burnt down he will have to create from his own imagination (with such evidence as he may be able to collect) the extent, height and plan of such fallen-down or destroyed building; and, so far as I am able to gather from the Bill, no remuneration is allowed for this, which perhaps to the general public is a minor point.

Back-to-back houses are prohibited, except with the Council's consent.

By a subsection of this same section 33, although I cannot quite see the connection, a new domestic building, if abutting upon two streets, is to have at least one window upon every storey looking upon each street—the full utility of this subsection I have been unable to define, unless it is to relieve the blankness of a flank wall—and then follows what I consider a recapitulation of the open space in rear of domestic buildings; but why this is again reverted to, as it has been already dealt with under section 30, I cannot understand, as it seems to nullify the former provision, unless the word "not" has been inserted by mistake.

Section 34, relating to courts or shafts within a building, is a new requirement.

It proposes that all courts or shafts within a building shall (if the walls around same exceed in height the length or breadth of such court) be open all the way up within 20 feet of the pavement level for purposes of ventilation to the extent of 50 superficial feet. This seems a very salutary requirement, and one with which architects would not be disposed to disagree.

Section 36 proposes to reduce the present maximum height of buildings from 90 to 75 feet, except with the consent of the Council, and should they consent to such increased height notice of such consent is to be published within one week, and not acted upon for twenty-one days after, so as to give any adjoining owners within 100 yards a right to appeal to the tribunal, and the owner of the premises, the height of which it is proposed to increase being refused by the Council, may also appeal to the same tribunal.

In further limiting the height of buildings it is provided that no building now existing or any new building shall exceed in height the distance from the front wall to the opposite side of the street. This point should be carefully considered by architects, as the rule at present only applies to new streets and not, as is now proposed, to old ones.

Coming to Part V., which regulates the construction of buildings, the first section, No. 39, deals with the thickness of walls, but why the rules as to their thickness should be relegated to a schedule, and the rules concerning other portions of the building are in the body of the enactment, I am at a loss to understand.

Referring to this schedule it will be found that the thickness of walls has in some cases been increased, and I believe brings them into line with the provisions of the model by-laws. I have prepared a diagram showing in black the thickness prescribed under the existing Act and the extra thickness proposed by the new Bill, which is added in red. An extra provision is inserted that all underpinning work shall be done in cement to the district surveyor's satisfaction, and a wall is not to be thickened without notice being first served upon the district surveyor, and the work is to be done to his satisfaction and built in cement. Concerning cross walls, an additional regulation is proposed to be made that when any portion of them forms an external wall the cross wall is to be of the thickness required for an external wall.

I think that if these thicknesses of walls were made into a table, as in the present Act, it would be more convenient for reference.

A little relief is given in section 41 to the hard-and-fast rule as to woodwork being set back 4 inches from the external face of

* A paper read at St. James's Hall before the Society of Architects, by Mr. Ellis Marsland. Mr. George Baines, F.R.I.B.A., in the chair.

a wall in the case of frames of stable and coachhouse doors, and the Council are empowered to make by-laws for further exempting oak and teak, provided the work be executed to the satisfaction of the district surveyor.

Under section 43 a table of the minimum scantlings for joists is given.

Attention is called to section 45, as it defines that a wall shall be deemed a party wall though only part of it is actually used as such, and that a wall between two buildings differing in height shall be deemed a party wall to a height of 10 feet above the roof of the lower building. At present the distance is only considered to be 15 inches. This provision will largely affect walls around a common area, and will prevent any openings being formed overlooking such area within a distance of 10 feet from any roof or flat.

In section 48 it is proposed, in factories or dwelling-houses over 20 feet high, that means of access to the roof be provided if there is a parapet, but nothing is provided where the roof has no parapet, until we get to buildings exceeding 60 feet high; then adequate means of escape from fire is to be provided, which is to be certified by the Council.

Another restriction not now existing is that the plane of the surface of the roof to every building except those for the purposes of trade or manufacture is not to incline from any external or party wall at a greater angle than 75 degs. with the horizon.

Under section 50 the course of a flue is to be defined on the face of the work by outline marks in some durable material, except when the exterior face of the flue forms part of the outer face of an external wall and not likely to be built against. This is, I think, a useful addition.

Rules are also inserted for the erection of furnace chimney shafts, which do away with the necessity of applying to the Council, a process at present very often involving delay.

A rather onerous duty is placed upon the district surveyor in section 52, as he is required to inspect and certify as safe any pipe of iron or zinc exceeding 10 feet in length once in every five years. This duty, added to that now existing of inspecting sky signs, will compel the Royal Institute, in addition to the present examination for qualification as district surveyor, to ask the candidates to undergo a special examination in gymnastics, with the Griffith Brothers perhaps sitting as assessors.

In section 55 the height of habitable rooms is increased from 7 feet to 8 feet 6 inches. This will prevent the speculating builder from compressing three storeys into the 25-feet limit of height for a 9-inch wall; and useful rules are provided as to the ventilation and lighting of habitable rooms.

Rooms over stables are to have pugged floors, and the staircases giving access to them are to be separated from the stables by a 9-inch wall. This wants amending to the extent that a fire-resisting floor of iron and concrete could be substituted for the wood-pugged floor.

Under section 56 ventilation and light are to be provided to the staircases of dwelling-houses—a most desirable rule.

Section 57 is one that concerns architects very materially, as it provides that every lift the superficial area of which exceeds 10 feet shall be enclosed with brickwork 9 inches thick, and any openings in the enclosure are to be closed with wrought-iron doors or shutters hung so as to close of themselves. This will be a very difficult rule to carry out, and will require some modification, or the application should be only to blocks of flats or public buildings.

In section 60 rules are provided for the erection of bay windows and oriels without the necessity of making special application to the Council. This will be welcomed by architects as an improvement upon the present system.

Dealing with the separation and cubical contents of buildings, I do not find that any attempt is made to provide any rules for the safety of shop assistants who have to reside in the upper parts of premises the lower portions of which are used as shops or stores. Many lamentable accidents and loss of life have occurred from the want of some rules in this respect, and I would suggest that the introduction of a new Building Act would be a fitting opportunity to provide against such disasters.

Section 67 also affects architects, and is a new one. The Council already possess powers as to providing sufficient staircases and means of exit to theatres, music-halls, and other places of public resort, but churches and chapels do not at present come within their rules. It is now proposed to frame certain rules under this section, which will provide adequate staircases and corridors of fire-resisting materials and also exits, the sizes of which are regulated by the number of persons to be accommodated; the minimum is 3 feet 6 inches, and all doors and barriers are to be made to open outwards.

Passing over Part VI. we find in Part VII. some useful provisions as to building walls on the lines of junction of the grounds of different owners, which are worthy of careful consideration, and will prevent the waste of much useful space, and allows, where an external wall is built up to the boundary of the adjoining owner, the concrete and footings to project on

to the adjoining owner's land, subject to compensation being given for damage occasioned; it also empowers a district surveyor, where two external walls adjoin, to allow footings on one side only.

The rights of building and adjoining owners are practically the same, as now only the time of notice is reduced from three to two months, and it is made quite clear that a party wall may be underpinned. Also that if a building owner serves a party-wall notice, he must act upon it within six months, and where a party wall is pulled down it proposes to make it incumbent upon the building owner to sufficiently protect by hoardings and screens the adjoining occupier, and any difficulties which have manifested themselves in the working of the present law it is proposed as far as possible to overcome.

Passing over Parts VIII., IX., X., XI. and XII., which are practically the same as the existing law, Part XIII. empowers the Council to make further by-laws, in addition to the powers in this respect which they at present possess, and on the following matters:—Open spaces about buildings, setting back of buildings, height of buildings, procedure, the dimensions of wooden bresssummers, the regulation of lamps, signs or other structures overhanging the public way, and also penalties.

Part XIV. proposes to assign exclusively to one magistrate all cases under this Bill, should it become law, with or without the execution of any duties to be performed under the Metropolis Management Act and its amendments. This would, I think, be a great convenience to all parties concerned, and would save a vast amount of time now wasted in the ordinary police-courts.

I should like to make some observations as to the constitution and duties of the tribunal of appeal proposed to be provided under section 150.

Firstly as to its constitution. Its number is to be five and to be as follows:—

One member to be appointed by a Secretary of State.

One member to be appointed by the Council of the Royal Institute of British Architects.

One member to be appointed by the Council of the Institution of Civil Engineers.

One member to be appointed by the Council of the Institution of Surveyors.

One member to be appointed by the Council, and no member or officer of the Council shall be a member of the tribunal of appeal.

The members are to be appointed for three years, and three to form a quorum.

Considering that the tribunal will have to hear appeals upon the following variety of subjects, viz.—formation of new streets, the widening of streets, increasing the width of streets from 40 to 60 feet, compensation to property owners whose premises have been burnt or destroyed and who are compelled to set back, the decisions of the superintending architect on questions of line of frontage, questions arising upon the reconstruction of old buildings, the Council's decision as to increasing the height of buildings, the engineer's decision as to dwellings on low-lying lands, and appeals under the by-laws—I do not consider the tribunal is numerous or representative enough; it should at least be seven, and as the matters to be dealt with by them deal largely with builders, the Institute of Builders should be represented upon it. Our own Society, which is a progressive one and has done much useful work, should also send one member, for, if the civil engineers are to have a member because, for some unexplained reason, the engineer of the Council has been pitchforked into the Bill for no purpose, so far as I can see, whatever—as the duty cast upon him with respect to buildings on low-lying lands could have been equally well discharged by the superintending architect—surely the Builders' Institute and this Society, as an incorporated society, should have a place upon the tribunal.

Seeing the number of subjects with which the tribunal will have to deal, those who will be placed upon it will have their time fully occupied for a considerable period. I would, in conclusion, add a few remarks upon the third schedule, which is perhaps a personal matter relating to the fees to be paid to district surveyors. The whole schedule has a district-surveying-at-co-operated prices flavour about it—a large deduction on taking a quantity.

I can imagine a builder entering a district surveyor's office and inquiring for the price list, and after deciding to have 5s. worth of this, and 7s. 6d. worth of that, and 10s. worth of the other, concluding his observations by querying whether he could not have sixpennyworth of slating thrown in, or otherwise he would prefer half a new building.

The whole schedule is very complicated and will lead to many misunderstandings, and the draughtsmen of the Bill, after offering with one hand this tempting assortment of fees, take it back with the other under section 129 by saying, "but one fee only shall be chargeable with respect to any such works done in, to, or upon any building, structure, or ground as are in pursuance of the foregoing provisions included in one notice."

I think the present schedule, with one or two modifications, preferable to the new one, and it is much simpler.

In conclusion, taking the Bill as a whole, it is well arranged, clear and concise, and with some amendments upon the lines which I have ventured to indicate, the result will be an addition to the Statute Book which the County Council may view with much satisfaction, and the general public be greatly benefited.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the monthly meeting held in the rooms, 114 West Campbell Street, Mr. Alexander McGibbon, A.R.I.B.A., president, in the chair, a paper was read by Mr. William Tait Connor, A.R.I.B.A., on "Theatre Planning." After a short sketch of its development, the regulations laid down by various countries for the erection of theatres and the restrictions as to site were considered. The only perfect site was said to be an isolated one having a slope towards the stage, in preference to being level, as this effects a saving in excavation and facilitates the drainage. Simplicity of plan was urged as essential, so as to be easily grasped by the audience. The subject was considered under the following heads:—(1) Approaches, consisting of entrances, exits and staircases; (2) the auditorium and its fittings; and (3) the stage, comprising dressing-rooms, scene docks, &c. In regard to entrances, it was recommended that the audience should be admitted by a special passage till the pay-box was passed, and then discharge into the main corridor, thus leaving it free at all times for exit. The various descriptions of barriers for reducing the width of passages for entrance and lifting checks were then described, also the position of pay-boxes and booking-office. Exits should be as short as possible and free from everything of a movable character, two at least being provided for each part of the house. All doors should be fitted with automatic panic bolts, and have the word "exit" above in plain letters. Staircases should not be in long, straight flights, nor yet too short, twelve steps being considered the maximum and three the minimum number. The landings should be the full width of the staircase, and never broken by single steps, the risers and treads being kept uniform throughout. Two staircases at least should be provided for each section of the house. In dealing with the auditorium, the substitution of cantilevers for supporting the balconies in place of columns was considered the greatest improvement in theatre planning within recent years. The arrangement of seats and gangways in relation to local by-laws was pointed out, and various patent seats described. The dimensions of the seating in the different parts of the house and the sighting were also touched upon. The auditorium should be well provided with windows, and balconies with escape stairs were also recommended. The necessity of making the entire building as far as possible fireproof was emphasised. In connection with the stage, it was shown how its dimensions were governed by the height and width of the proscenium opening. The position of the scene docks, dressing-rooms, stage entrances, workshops, &c., were explained, and diagrams showing the arrangements in some of the most modern theatres were exhibited. It was strongly urged that all theatres should be supplied with a fireproof curtain, those of the iron lattice type covered by some incombustible material, sliding in iron girders, and worked by hydraulic power, were recommended. The lighting, heating and ventilation were briefly alluded to.

EXCAVATIONS IN THE CAUCASUS.

A LECTURE was given on the 15th inst. before the Glasgow Archaeological Society by the Hon. John Abercromby, on "Some Recent Excavations in the Caucasus." He said the Caucasus had long been a wonderland. In Greek fable it was famed as the land of the Golden Fleece, as the place of punishment of the overbold Prometheus. It used to be considered the centre of dispersion of European peoples, and until recent times it was regarded as the region where the art of metallurgy originated. His paper was devoted to a description of some of the more recent excavations that had been made on both sides of the great chain of the Caucasus, and on the adjoining district of Russian Armenia. Premising that archaeologists are inclined to the belief that the Caucasus was uninhabited before the arrival of the use of metals, he proceeded to describe in detail the results yielded by the examination of places of interment, and afterwards summarised the conclusions of M. Chantre with regard to those belonging first to the earlier period, which he placed between 1500 B.C. and 700 B.C., and second to the later or Scytho-Byzantine period, which dated from about 700 B.C. to 700 A.D. The majority of the forms and decorative motives of the cemeteries of the iron age in the Caucasus and in all Europe were, if not identical, so analogous that we were bound to attach them to the same civilisation. It was interesting to find incrustations of iron in bronze in the Caucasus, in Switzerland, and Austria; to find daggers

with antennæ identical with those of Hallstadt; to find torques like those of Bosnia and Jura, belts of thin stamped bronze and pendants of forms thought to be peculiar to the Tyrol, spirit armlets like those in the Alps and on the Danube. While this was the opinion of M. Chantre, Professor Kondakoff, Count J. Tolstoi and M. Reinach, with fuller knowledge and writing six or seven years later, came to the conclusion that a number of objects found north of the Caucasus showed an analogy with others from southern Russia belonging to the first centuries of our era. They would not admit that the Caucasian finds were anterior to the Christian era. Mr. Abercromby next proceeded to describe the explorations of M. de Morgan in the year 1887 and 1888 of five cemeteries situated to the south of the Caucasus in a line drawn from Batoum on the west to Baku on the east. These cemeteries represented four distinct periods, the oldest from 2500 B.C. to 3000 B.C., and the latest belonging to the seventh and fifth centuries B.C. M. de Morgan divided the 250 tombs opened by him into four classes—(1) dolmens of large dimensions containing bronze weapons; (2) kists or small dolmens containing bronze arms of a later period; (3) kists of a transition period in which iron began to be used, and (4) kists containing iron alone. The oldest dolmens were found on mountain tops, even at an elevation of 9,000 feet, either isolated or in groups. In these the arms were of bronze, consisting of long two-edged swords, daggers, lanceheads, arrowheads and axes. Ornaments were rare, and included necklaces of cornelian beads and blue porcelain bangles and pins of bronze. One necklace contained a well-polished agate engraved with *Vos zebu*, which seemed to indicate relations of some kind between India and the north-west of Persia in the bronze age. The pottery was coarse and without ornament. The mortuary furniture of the second-class was rich and artistic, that of the third less so. With the appearance of iron a great change took place. Bronze weapons were gradually replaced by swords, poniards and spears of iron. Pottery affected the forms of birds, oxen and horses. From the similarity of the dolmens of the first inhabitants with those found in India, throughout Europe, and in the north-west of the Caucasus, M. de Morgan believed that they were probably all constructed by different tribes of the same Aryan race. Professor Veitch moved a vote of thanks to Mr. Abercromby, and in doing so remarked that though it was perhaps not true that the whole of Europe was peopled from the Caucasus, the similarity of the modes of burial seemed to indicate that there was some immigration from these regions. Sheriff Birnie seconded the motion. Dr. Murray, in the course of a lengthy criticism of the paper, gave it as his opinion that the author, Mr. Abercromby, had overshot the mark in carrying the period under consideration so far back as 3000 B.C. Mr. Abercromby briefly replied, and the proceedings terminated.

PICTORIAL ART.

A LECTURE was given in Leeds on the 15th inst. by Mr. F. Suddards, Art Master at the Yorkshire College, on "Pictures, and How to Understand Them." He explained at the outset that his object during the course would be to teach the average visitor to the city gallery, who was, he imagined, technically unlearned in art, how better to understand and appreciate pictures, and to enable those who were confessedly ignorant on the subject, to see paintings and other works of art from a more intelligent standpoint. Pictorial art of the present age was so varied in style, and was influenced so much by the peculiar characteristics of different individuals and schools, that it was not surprising the great mass of the people were confused amidst the diversity of styles which every picture exhibition presented for the study and criticism of its visitors, nor astonishing that a difficulty was experienced in discriminating between what was artistically sound and what was unworthy. It was impossible to lay down any set of rules for the guidance of the uninitiated. One of the difficulties which art teachers had to contend with was that definite rules were impracticable. Art would cease to be art if it were reduced to any rigid system of rules and formulæ; it would then become a science, and cease to charm. Like science, it might then be a useful factor in the world—not be, as now, a power to beautify and ennoble the prosaic existence of a workaday world. While, however, there were no rigid rules, except those which referred to the purely practical side of art, such as linear, perspective and anatomy, and which were really sciences useful to art rather than parts of art itself, there were rules in no sense rigid that were modified in a greater or less degree by the individual genius of different men. Sir Joshua Reynolds said, "Unsubstantial as these rules may seem, and difficult as it may be to convey them in writing, they are still seen and felt in the mind of the artist, and he works from them with as much certainty as if they were embodied upon paper." If there was one thing more than another which distinguished painting of the present age, it was the sympathy

which artists had almost invariably shown with the various forms of natural beauty. Landscape-painting especially was quite a modern development of art, and a development which was truly English. The beauties of natural scenery did not seem to have appealed to the old Italian masters, landscape being rarely introduced into their works except as a secondary element, and even amongst the later masters of Western Europe, who gave far more prominence to landscape in their pictures, there was very little approach towards the truth to nature which was so characteristic of the nineteenth century. The study of landscape in a thoroughly realistic way was essentially modern, in the sense that it dated from the period when Constable and Turner broke away from the traditional treatment which had been so long the fashion, and by their direct study of nature opened the eyes of the people to the loveliness of nature in its various moods and aspects. In more recent times the movement had been considerably advanced by the writings of Ruskin. Living as they did in a city given up so completely to commerce, and which could not lay claim to possess, except on the outskirts, any features of natural beauty, he maintained that the possession of an art gallery must not by any means be looked upon as a luxury, but rather as an indispensable necessity, which should receive all possible support from wealthy townspeople and the city fathers. In this way could some compensation be made for the destruction of national beauty which commerce brought in its train, and the poorer citizens might obtain refreshment and pleasure from the mirror of nature held before them in the works of art possessed by the public gallery. It would be well for the artistic and social welfare of the city if the debt which commerce owed on account of its wholesale destruction were more recognised by those who had reaped such large stores of wealth thereby. Much had been done in this direction by some of the citizens of Leeds, but much more might be done in the way of gifts of really good pictures or art objects to the Art Gallery, where the poorest might share with the rich in the opportunity of enjoying the works of our greatest artists.

TESSERÆ.

The Flamboyant Style.

FLAMBOYANT resembles in many respects our Perpendicular or Tudor architecture, but exhibits many very marked differences when we compare it with that style. Thus we have, in both these styles, pinnacles crocketed, finialled, grouped and formed into niche-canopies; surfaces covered with moulded panels, pierced parapets; and, as we advance, Italianised members and arrangements make their appearance in both. But while the Tudor style has the four-centred arch peculiar to it, the Flamboyant has the three-centred and the horizontal line arched at the ends. It is also far more common in the French than in the English style to have in various situations a multitude of niches filled with statuary, and especially in the hollow mouldings of arches. The lines of Flamboyant panelling and tracing are not by any means distinguished, as those of the Tudor times with us are, by the universal predominance of perpendicular lines. On the contrary, they run into peculiar flame-like forms, from which the name has been taken. Some of the features of the Tudor and the Flamboyant styles which most deviate from the Gothic of the better times, probably indicate in both a nearer approach to the period of the revival of Classical architecture; as polygonal pedestals and abacuses with concave sides—the prevalence of hollow projecting mouldings filled with flowing strings terminated by lines of coronal points above—and lines curved and broken in various ways, substituted for the straight sides of the triangular heads of pinnacles. The superiority in richness and variety appears to be on the side of the French style—at least we have nothing which can be well compared with the richest members of their work; especially their portals with free tracery hanging like an edging of lace from the border of the arch, and the arch mouldings completely replaced by lines of canopies and statues.

Suburbs of Ancient Rome.

The destruction of the great families under Nero and his immediate predecessors, combined with the modest habits of Vespasian, and generally with the growing disgust of the nobility at the monstrous abuse of wealth in the preceding generation, to introduce a less ostentatious style of living among them. The mansions of the nobles became fewer perhaps and less spacious, and allowed proportionably more space for the dwellings of the poorer citizens. Yet there were still great obstacles to the extension of the suburbs of Rome. The roadsides were occupied with sepulchres of twenty-five generations, and it was forbidden by feeling as well as by law to dwell within a certain prescribed distance of the remains of mortality. The performance indeed of certain ceremonies sufficed to desecrate these hallowed spots, but if we may judge from the well-known monuments of the dead which have been discovered

even within the Porta Appia, and still more numerous in quite recent times beyond it, it would seem that on this, the most frequented of all the Roman ways, there was little use made of such a privilege. When two centuries after our era Caracalla proposed to erect his vast public baths, he found, we may suppose, little impediment from private buildings at only half a mile's distance from the Porta Capena. The Grotto of Egeria, almost immediately under the Servian walls, continued in the time of Juvenal to be surrounded with a grove, the resort of beggars, idlers and the lowest classes of the people. There was a distinct village at the Milvian Bridge, about three miles from the Capitol, but in the immediate neighbourhood we read of rural villas and pastures. That there was no suburb below the city on the river banks may be proved from the absence of any trace or record of a bridge across it. It is remarkable, again, that our accounts of various events which took place a little outside the walls indicate the solitude of the country rather than the character of populous suburbs. The estate of Phaon, Nero's freedman, in which that emperor concealed and finally destroyed himself, was situated four miles from Rome, between the Salarian and Nomentane ways. The fugitives from the city pursued their way some distance along the high road, and then turned aside to reach the villa, which was described as lying among bushes and briars and approached by a track through a canebrake. At the fourth milestone in another direction Festus tells us there was the Nævian forest, notorious as the retreat of rogues and vagabonds. The soldiers of Vitellius, on their approach to Rome, encamped on the unwholesome slopes of the Vatican. Certainly there was no continuous suburb on the Salarian way beyond the Colline gate. "Cerialis," says Tacitus, "sought to enter Rome by this road; he was met by the Vitellians not far from the city among houses and gardens intersected by crooked paths." This would be in the vicinity of the modern Porta Pia. When the forces of Antonius shortly afterwards approached the city in three divisions by the Flaminian way in the centre, by the bank of the Tiber and the Via Salaria on the right and left, they were opposed by the Vitellians under the walls of the city on all three points, but the narrative gives no indication of a street combat anywhere. On the side of the Pincian the Antonians advanced by narrow and slippery paths between garden walls, and it was not from the houses but from the garden walls that the Vitellians opposed and checked them till taken in the rear by another party which entered the Colline gate. But as soon as the contest was transferred to the interior of the city then the difference was at once apparent; the horrors of civil war within the city walls, the passions of the multitude, the ghastly mixture of levity and ferocity among the spectators of the fray, baths streaming with blood, doorways choked with dead, taverns reeking with slaughter, are delineated by the first of historical painters in a vivid picture which might be transferred to the centre of revolutionary Paris. The absence of the remains of buildings, or generally of any traces of their foundations at a short distance from the city, should not perhaps be pressed too closely; it may be believed that the suburbs, wherever suburbs did exist, consisted chiefly of inferior dwellings, constructed of the light unsubstantial tufa, or even wood or of unburnt clay, all vestiges of which would of course speedily disappear both above and below the surface.

Mediæval Tapestries.

Painted hangings were largely used in the Middle Ages, though remains of them are very rarely to be met with. At Reims, in the Hôtel Dieu, several of this kind of hanging are still preserved, and have been described by M. Lebertias in a volume devoted to them, published in Paris in 1843. They were used for hanging from the triforia of churches, from windows of houses on the occasions of great solemnities and for similar purposes. The Bayeux tapestry is one of the earliest, if not the earliest, work of the kind, and was probably meant to be used in the same way. It is, as might be expected, rude in execution, but at the same time full of vigour and honesty of expression. The story is told throughout so well and naturally, that there is no possibility of mistaking it; and the character of the work executed with wool on linen is infinitely effective, and obtained with far less labour than those works in cross-stitch to which ladies devote themselves in this nineteenth century. The Bayeux tapestry measures about 210 feet by 19 inches, and is, as Augincourt observes, a history written and painted at the same time; for, as is usually the case in these early works, the figures bear their names inscribed by their sides, and there are other inscriptions below them referring to the events represented. It is all executed in wool on linen. The stitches are long, single stitches, and the lines of drapery folds and edgings are all marked with lines of twisted wool laid down on the work. The material is different, but the mode of execution is the same as in the early Durham embroidery. The subjects usually selected for these early tapestries were from the Old and New Testament, the lives of the saints, fables of antiquity, and Mediæval versions of Roman history; allegories, hunting pieces and the like were

also represented; and, in short, these tapestries exemplified as much as anything the popular feeling, spirit and literature of the age. They were mystical and chivalric in the early period, allegorical in the decline of the Mediæval period, and Greek and Roman at the period of the Renaissance in the sixteenth century. Inventories show how much these tapestries were prized. In 1385, Philip the Hardy bought at Arras, for 700 francs, a piece of 36 ells long, representing the virtues and vices. This was a "high warp" as distinguished from a "low warp." The former was most prized, and was marked with a perpendicular waif in place of a horizontal one as in the latter. And in 1419 a piece of tapestry measuring 210 square ells was sold to Jean Sanspeur for 4,000 francs. At Halberstadt, in Hanover, the choir of the cathedral still retains all its old hangings, some of them thoroughly Byzantine in their style, the others of more advanced Gothic character, all of them illustrating Scripture subjects. The earliest of these are no doubt works executed entirely by hand, but the later tapestries were loom and not hand works. The finest examples in England of these are the tapestries under the screen in the hall at Hampton Court, and those at the end of St. Mary's Hall at Coventry. Both of them appear to be the work of foreign looms. In France, the cathedral and the church of St. Remi at Reims, the church at Montpezat and the Abbey of Chaise Dieu, and churches or collections at the Cluny Museum, Dijon, Nancy, Beauvais contain some of the finest; and the magnificent series of tapestries preserved in Berne Cathedral must not be forgotten. In many of these lines of gold and silver thread are worked in with the work, and add much to the beauty of the fabric. The Chaise Dieu tapestries are fourteen in number, 10 feet in height, and of various lengths. They contain the life of Our Lord, with the Old Testament types, and have been illustrated in a volume published by M. Jubenal. The names of figures are often *appliqué* in embroidery on tapestry.

Place and Palace.

"Be it known," says Pennant, speaking of the word "place" as applied to great mansions and interpreted by him to mean palace, "that the word is only applicable to the habitation of princes or princely persons, and that it is with all the impropriety of vanity bestowed on the houses of those who have luckily acquired money enough to pile on one another a greater quantity of stones or bricks than their neighbours. How many imaginary parks have been formed within precincts where deer were never seen? And how many houses misnamed halls which never had attached to them the privilege of a manor?" This is true, but unless the words *palazzo* and *piazza* are traceable to the same root, *palatium* = place does not necessarily mean palace; and palace certainly does not mean exclusively the habitation of princes or princely persons, for in Italy, whence it comes, any large mansion may be called a palace, and many old palaces there were built by merchants. *Palatium*, it is true, with the old Romans, though it may have originally meant any house on Mount Palatine, yet in consequence of that place becoming the court end of the city, and containing the imperial palace, may have come ultimately to mean only a princely residence. Ovid uses it in that sense in his "Metamorphoses." But custom is everything in these matters. Place is now used as a variety of term either for a large house or street. Perhaps in both cases it ought to imply something of the look of a palace, or at least an openness of aspect analogous to that of a square—square in England corresponding with place, *piazza* and *plaza* on the Continent. The *piazza* in Covent Garden properly means the place itself, and not the portico.

Pre-Periclean Athens.

Athens, the place of earth's noblest sons, the hearts from whence flowed out her bravest blood; Athens, which was civilised while Arcadia still offered up human sacrifices, where hospitality became almost proverbial, and which, fostered under Cecrops and perfected under Pericles, was the grandest city beneath the Sun-god's rays. The very stirring of her plane and olive-trees was visible in the clear dawn; the hum of her countless life might be heard through the still air. There stood the Acropolis with her statues, shrines and offerings, with her glorious temples, the noblest yet to come. But though no Propylea as yet opened their brazen gates to the thronging multitude, no Parthenon, replacing and surpassing the ancient Hecatompedon, as yet enclosed the virgin goddess in all its finished splendour, yet the Erechtheion held within its Ionic circle the mystic statue of the Athene Polias, that form of the city's guardian which fell from heaven, as a sign from Zeus of favour and of love, and the rising sun kissed the lips of the Phoibos of Phidias. The Pandrosion, with its graceful portico of panathenaic caryatides, contained the sacred olive-tree which Athene produced when she contended with Poseidon for the honour of being that city's protector, also the holy fount which the sea-god caused to flow at his bidding when he smote the earth in anger at Jove's daughter. The olive-tree had been burnt by the Persians and apparently destroyed, but, lo! the

next night it had sprouted forth more verdant and vigorous than before, a sign of the indestructibility of that which comes from the gods, a mark of the immortality of a life whose roots are in heaven. It was the parent of the twelve sacred trees in the groves of the Academia, near the Temple of Athene, and these again produced the olives in the Cephisian plain, which in their turn produced all that grew in Attica. Little wonder then that stringent law, which proclaimed death to him who, without sufficient reason, should hew one of Attica's olive-trees to the ground. The Erechtheion was not only wonderful for its beauty of construction; it contained not only the blackened Zeus-given statue, but the bones of Erechthonios, whose birth was so mysterious and inexplicable, reposed beneath its sod; the golden lamp, with its asbestos wick of Carpasian flax, which, once supplied with oil, could burn for a whole year round, and the brazen palm-branch suspended above it to serve as a funnel for the smoke, both made by the young artist Callimachos, but honoured from their perfectness as if hallowed by time; the folding-stool of Daidalos; the strange old Pelasgic statue of Hermes before the door now hidden in myrtle boughs, were the oldest or most beautiful things which the sanctuary of Athene Polias contained. Add to these the sacred serpent, mysterious emblem of an elder worship, and the silver-footed throne of the Persian king taken at Salamis, and it might well be said to contain the most splendid as the most mystic trophies of the spiritual and worldly dominion of Athens.

Study of the Antique by Painters.

The introduction of a classical taste in costume by Michel Angelo and Raphael led to the practice of drawing and often painting from colourless objects, and the study of the human form from the remains of Grecian art that were discovered in their time led to the same practice. No painter before Michel Angelo and Raphael had paid much attention to the antique, with the exception of Andrea Mantegna; and the power in colour which he was hindered from acquiring as long as he imitated the Greek *bassi-rilievi* that were known to him, he afterwards gained in the school of the Bellini. That the study of form, from stone or plaster, suspends for the time all improvement of the eye in colour, and if too long continued destroys its sensibility to hues and tones entirely, is strikingly exemplified in the French schools of David and his contemporaries. Now though Raphael studied the antique with that excellent judgment that rarely at any time deserted him, though he studied it rather in its spirit than its letter, and used it as a guide to and not as a substitute for nature, yet the time spent in attention to it was so much withdrawn from the study of colour, and the substitution of classical draperies for the dresses of his time was so much more. It became also the custom of Raphael to make black chalk-drawings from nature for heads, hands, &c. of his figures, and from these he seems to have painted without again consulting the model. In the collection made by Sir Thomas Lawrence was a very admirable and finished study of this kind, as large as life, for one of the principal heads in the *Transfiguration*. The studies of the Venetians, as Reynolds has remarked, were chiefly made with colours, and so, probably, were those of the German, the Dutch and the Flemish schools. In the British Museum are some sketches of landscape from nature by Albert Dürer, made in colours only. From the time of Raphael to our own it is indisputable that those painters who have devoted the most time to the study of the antique have always been the least excellent in colour, while the greatest colourists of all schools have rarely had any acquaintance with ancient sculpture; in our own school, for instance, neither Hogarth, Reynolds, nor Gainsborough ever drew or painted except from nature.

Covent Garden in the Seventeenth Century.

Sir E. Verney took the last two houses in the Piazza on the eastern side of Covent Garden, running north from Great Russell Street, and now the Bedford Coffee-house and Hotel, upon lease from the Earl of Bedford, at an annual rent of 160*l*. There were coach-houses and stables in the back premises, and it appears from the enumeration of fixtures that, although the ordinary rooms had merely "casements," the principal apartments were distinguished by "shuttynge wyndowes," and that the door of almost every room had its "stock lock." A reservation was made of the earl's right to the "walk underneath the said messuage, commonly called the Portico Walk, as the same is now made and perfected by the said earl, but with power for Sir Edmund Verney to expel youths playing in the said walk to his offence or disturbance." Part of the houses were "waynscotted," a distinction deemed so important that "the use of the waynscott" was specifically granted in the lease, and all the separate pieces of "waynscott" were enumerated in a schedule of fixtures. There being as yet no sewer in this new district, Sir Edmund fortified himself with a clause that if he was annoyed by that circumstance as not to be able to continue there "with any conveniency," he might resign his occupation on giving the earl six months' notice.

NOTES AND COMMENTS.

THE experiment in housing large numbers of the inhabitants which has been undertaken by the Canton of Berne may be considered successful, if a return of over 3½ per cent. on the outlay can be accepted as a test. A new quarter outside the city is being created. It was found that some parts of Berne were overcrowded, and as it was considered that the industries were thriving, it was anticipated that other districts would also suffer from an increase of population. The conclusion was drawn that it would be wisest to erect dwellings on the Wylerfelde, about a mile beyond the city. Four years ago a vote for raising 85,000 francs was passed. Immediately fourteen semi-detached houses were erected. The cost per house, including fencing of garden, water supply, &c., was 4,120 francs. The accommodation consisted, on the ground floor, of a kitchen, that could serve as a dining-room also, and a living-room, that could be used for a bedroom. Above were two rooms, each adapted for a sitting and bedroom. The rent charged for a house was 20 francs monthly. In August, 1890, the sum of 100,000 francs was voted, and in the following December 800,000 francs, and other sums were afterwards assigned. Experience has enabled many improvements to be introduced, but apparently the cost per house never exceeds 4,500 francs. The tenants appear to be satisfied, and it is understood that their improved condition has a beneficial effect on their character. The Swiss authorities seem to have facilities for undertaking public works of the sort, for from the constitution of the country the smallest disbursements have to sustain a microscopic examination, and jobbery receives scant mercy from the populace. On that account, it must not be concluded that in England every venture of the kind will be equally successful.

THE majority of surveyors are aware of the existence of tenures in various parts of England which present anomalies that are not easily explained. The manorial tenure of Holderness in Yorkshire may well be classed among them. It was lately described before a local antiquarian society. It appears that in the East Riding, west of the river Hull, the early townships had been conducted on the three-field system, but in Holderness on the two-field system, without the period of fallow, the exception being Hornsea. Before the formation of the Seignior of Holderness, all the townships of the district doubtless formed separate manors, but were then absorbed in the Manor of Burstwick. The various manors were represented at the great Burstwick court by their pennygraves, officers so called because they had the right to receive a penny from persons of their manor wrongfully absent. The Manor Court was presided over by the steward, a jury of thirteen, called the Court Leet Jury, being summoned to present misdemeanours within the manor. Part of these were the affearers, whose function was similar to that of a grand jury of the present day. The under-steward empanelled another jury called the Homage Jury, whose duty it was to inquire into the committal of waste, surrenders and succession of the copyholds. The earlier return for the occupation of another's land was personal service. In the country the service became largely commuted for a fixed money payment; this was tenure in socage. In the towns a similar arrangement was adopted, except that here there was, perhaps, more of the element of rent; this was tenure in burgage. Tenure in burgage had this peculiarity, that if unchallenged for a year and a day it was to hold good for the future, whatever the circumstances. Much might be said of the free burgage tenure, as shown by the holdings in the town of Hedon. The charter of HENRY II. doubtless but confirmed what had already existed. The rents under that tenure are still gathered, under the name of "town's rents." By the reign of ELIZABETH, and during it, the governing body of Hedon had gathered into its hands considerable property by estreats falling in by reason of waste, default of rent, of repairs and of heirs, the Corporation considering itself tenants *in capite*. This was changed in 1630, when the Viscount DUNBAR brought a suit to recover the rights of the lords of the Seignior as lords of the capital fee in Hedon as elsewhere. The suit was defended on the ground that the lands and tenements were not holden of the plaintiff. A decree was issued declaring

that all future escheats should be enjoyed by the lords of Holderness, but that all alienated lands should be left in the owners' hands. It was, in fact, a verdict for the plaintiff, without any retrospective force. Among other things mentioned was the old manorial custom at Hedon that a child, man or woman, may sell and surrender their copyhold estates when they reached the age of sixteen.

THE eighty cottages which the Corporation of Dublin propose to erect on the ground obtained by the clearance of tenements in White's Lane and neighbourhood are to be one storey high. Each cottage will contain three rooms, namely, a living room, with the average length of 16 feet 3 inches and width 10 feet, and two bedrooms, one 9 feet 9 inches square, the other 11 feet in length by 7 feet 8 inches in width. A separate concreted yard will be provided for each cottage, 12 feet 3 inches in length by 18 feet 3 inches in width, with water-closet, scullery and coal-bunker. The removal of the existing houses will be an advantage, for they are among the most neglected in the city. The occupants are of the poorest class, for when inquiry was made it was found that out of a population of 640 not more than 63, or one-tenth, were employed.

As Milan from its position is more likely than the southern cities of Italy to be affected by the social and economic forces of Germany, France and England, it is not surprising that the organisation of labour in the city has not been a failure. Since September, 1891, a Labour Chamber has existed, and the old castle of Milan is used for the offices. One of the chief objects of the Labour Chamber is to establish free registries, and by thus connecting the supply of labour with the demand, to do away with the middlemen who exacted heavy fees from the operatives for whom they found work. The masons have been among the earliest to set up a registry of that sort. One of the reasons which inspired the creation arose out of a curious practice. The masons and bricklayers formerly waited to be hired on a bridge crossing the Naviglio, but in November, 1891, they resolved in a crowded meeting that this custom was "a constant insult to the civil character, the dignity and the interests of workmen." It was therefore abolished, and in February, 1892, a labour registry for masons was opened in connection with the Central Labour Chamber. The system of telephones has been of good service to the committee in making arrangements between contractors and workmen. In about six months of 1892 employment was found without the aid of the middleman for 465 masons, bricklayers and labourers, 104 carpenters, besides marble workers and other trades. An annual subsidy of 15,000 lire, or 600*l.*, is allowed by the municipality of Milan to the Labour Chamber.

M. JACQUES LEONARD MAILLET, who died on Wednesday in last week in his seventy-first year, could be taken as exemplifying what can be accomplished in France in making a sculptor out of an industrious man who was not gifted with genius. A Parisian by birth, he began his training early, and in 1845 he won the Prix de Rome. On his return his careful execution gained the favour of the judges, and in 1853 he was awarded a first-class medal, but subsequently he was deemed worthy of only second and third-class medals. M. MAILLET was able to hit upon capital titles, such as *Primavera della vita*, which raised expectation, but when only a commonplace figure was found to be so designated, the disappointment was increased. Then doubts arose about M. MAILLET having the temperament of an artist. Probably he corresponded with old GRIGNEUX in M. PAILLERON's new comedy, and possessed intelligence rather than instinct. However, he won the favour of the Court, and his works were purchased for the Luxembourg. He was asked to design table ornaments, which were melted in the fire at the Tuileries. One of his commissions has a sort of historic interest, for he undertook the restoration of the Colonne Vendôme, which had been destroyed by order of COURBET, the painter, under the Commune. M. MAILLET left directions that his *Printemps*, his last completed work, is to be exhibited in the next Salon veiled in crape.

The Architect, Feb. 23rd 1894.





PHOTOGRAPHED BY BEDFORD, LEWIS & CO

INX PHOTO SPRADUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

PARISH CHURCH, HAMPSTEAD.
The Late F. P. COCKERELL, Architect.



The Architect, Feb. 23rd 1894.

London & South Western Bank Highgate

Truefitt & Watson Architects.

5, Bloomsbury Sq. W.C.



Die Architektur. Feb. 23^{re} 1894.





INX PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER, ANL. EX.

PHOTOGRAPHED BY BEDFORD, LEWIS & CO.

"EGERIA."
By the Late J. H. FOLEY, R.A.

ILLUSTRATIONS.

PARISH CHURCH, HAMPSTEAD.

EGERIA.

THE CHURCH HOUSE, STOURPAINE, BLANDFORD.

VILLAGE CLUB, WALTON-ON-THE-HILL, SURREY.

LONDON AND SOUTH-WESTERN BANK, HIGHGATE.

THESE premises, consisting of a bank and shop adjoining, are now in course of erection for the directors of the London and South-Western Bank, Limited, from the designs of Messrs. TRUEFITT & WATSON, architects, of 5 Bloomsbury Square, W.C. The lower portion of the front elevation of the bank is in white Mansfield stone, the upper portion being in red brick with stone dressings. The ground floor is devoted to the banking business and consists of a banking chamber, with manager's room, &c., adjoining. The fittings are in teak. The strong rooms occupy the basement and are fitted with iron grilles and fireproof doors supplied by the Milner Company. The upper floors of the building are arranged for the manager's residence. The building throughout is fitted with electric bells and every modern appliance. The contractors for the whole of the work are Messrs. R. D. LOWN & SONS, of Upper Holloway.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. Woodthorp in the chair, Mr. Mountford, president, being absent through illness.

After the transaction of some preliminary business,

Mr. J. L. ROBINSON, R.H.A., of Dublin, showed a beautiful series of lantern slides, illustrating annual excursions of the Association to Shrewsbury, Taunton and Diss.

Among the views of buildings shown were those of the 1891 excursion as follows:—

Wroxeter, Buildwas, Benthall, Much Wenlock, Whitehall, Church Stretton, Plaish Hall, Shipton Hall, Albright Hussey, Moreton Corbet, Haughmond, Stokesay, Ludlow, Pitchford Hall, Acton Burnell.

In the excursion of 1892:—

Bishop's Hull, Trull, Poundisford Park, Ruishton, Creech St. Michael, Dunster, Minehead, Cleve Abbey, St. Decuman's, Bridgwater, Cannington, Blackmoor, Spaxton, East Quantoxhead, Nettlecombe, Combe Sydenham, Kingston St. Mary, Cothelstone, Bishop's Lydeard.

In the excursion of 1893:—

South Lopham, Quidenham Church and Park, Wilby Hall, New Buckenham, Scole, Rodenhall Church, Pulham St. Mary, Thelveton, Ipswich, Helmingham, Framsdon, Brome Church, Wingfield Castle, Framlingham, Earl Soham, Flemings Hall, Eye.

Mr. H. L. Florence, past president, proposed a vote of thanks to Mr. Robinson. The vote was seconded by Mr. Maurice. B. Adams, supported by Mr. Thomas Yates and carried by acclamation.

Mr. ROBINSON suggested that the Association might with great advantage revisit some of the old fields. To the Diss district, for instance, they had not been able to do proper justice.

AUSTRALIAN MOUNTAIN SCENERY.

THE following paragraph we have received from Mr. John Plummer, of Sydney, N.S.W.:—The beautiful scenery of the Blue Mountain range produces on the traveller an entirely new impression. There are no snow-capped peaks upon which the rising and setting sun produces strange and magnificent colour effects; nor does any peculiar shape of the summits strike the imagination, as in the Alps and Pyrenees of the Old World. On the contrary, from the broad plains the far-spreading mountains look rather insignificant. But gazing from the edges of the high tableland into the deep valleys below, the mind is awed by the realisation of the magnificent scale on which nature has worked in these solitudes. In many places the cliffs rise 2,000 feet perpendicularly from the valley beneath, and the hills at their feet, formed by the accumulation of *débris* from their sides and from the plateau above, appear as slight undulations. The valleys and sides of the gorges, wherever there is soil, are clothed with dense vegetation, and over all is the mantle of blue haze, which makes the whole effect most striking, and has given to the range visible from Sydney its appropriate name.

WOOD CARVING.

AT last week's meeting of the Northern Architectural Association, Mr. Ralph Hedley read a paper on "Wood Carving." He said his paper was intended for the students in architecture, and only where the art of carving was used in architectural decoration. He reminded them of the great antiquity of the art of carving. They had examples in their museums in flint, stone, bone, wood, &c. All they knew of ages gone before was in some cases from the rude inscriptions and carvings, the early Saxon interlacing pattern, which was more elaborated by the Normans. Then there was the Early English, Decorated and the Perpendicular styles. The Early English was more suited to stone, while the Decorated and Perpendicular styles of architecture were most pre-eminently adapted to wood carving, and most of his remarks would have reference to these, particularly to the latter. The eye demanded that hard and severe lines required softening and blending. This was early felt. Thus the elaborate lace-like tracery in church windows, and in domestic furnishing they had curtains and shades to soften the light. He held that carving answered the same purpose in softening cornice lines, frieze mouldings, caps, &c. The middle of the sixteenth century saw the development of the grand style itself. Mr. Hedley proceeded to describe the fine panellings and other carvings in Carlisle Cathedral. There were beautiful carvings, too, in Hexham Abbey. The miserères, though not so elaborate as at Carlisle, were very spirited. There were also some bench ends worthy of attention in the old church of the Venerable Bede at Jarrow; they were rather coarse, but full of spirit. The Perpendicular bench ends at Durham Castle were splendid examples and well worth studying, and there were also some good examples of Elizabethan or Jacobean woodwork in the staircase. There were some fine Jacobean stall ends, &c., in Brancepeth Church, and, he believed, some very small pieces of Early English tracery. He thought they were very fortunate in having so near Hexham Abbey and Carlisle Cathedral to study the Perpendicular wood carvings. There must have been a great amount of vandalism at one time at Hexham, for there were several bits of the carving in domestic furniture in the district. He had never had much time for globe trotting, but he had learned a great deal of what he knew from the Hexham and Carlisle woodwork. Of course, he had sketched in many other cathedrals and churches further afield—Exeter, Norwich, Chester and Ely more particularly. The most elaborate poppy-heads he had seen were at Chester. Some were of a very quaint style, in particular one with three angels, the middle one forming the centre of the poppy-head, with wings, the other two angels coming out at the side, with wings flowing off into the bench end. There were some of these poppy-heads with foliage not rounded off, but carved or cut as if it had been done with wood only an inch thick instead of four inches. The other side of the poppy-head was also carved flat, and the ends were carved with a small bit at each side cut through, the square edge of the outline being preserved. He much preferred the earlier work to the more elaborated. Take some crockets at Ely. They were like broccoli cabbage, withered and dead, representing nature in its decay, what one would see thrown out of the vegetable market. Foliage should be studied from the living and growing, not the withered and dead. To begin with, the main lines should have life. Look at the common fern growing; how it shot up, springing from its root with an almost straight line, yet not such a straight line that might be drawn with a set-square—just such a line that could not be described, but only seen and felt. How suddenly it ran off into a scroll, day after day unfolding itself, not making a dreamy curved line, but growing; like all living things, it meant to live. That was the principle he endeavoured to put into all the carving entrusted to him. Still keeping to the value of the decided line, with life and go, because all carving depended on this: all lines that could be described with a T-square, set-square, compass, or that could be conveyed verbally or by instructions to any given size or radius, were strictly architectural. But he thought they should never be used in designing carving. He desired to leave carving for a moment, and to show what a line could do and what nature had provided for before the simple square, circles, and so-called line of beauty. He might say that he strongly objected to the line that had been called the "line of beauty"—that was, Hogarth's line of beauty. It was too sleepy; it seemed to have been described with a compass, with a radius at each side, and joined in the middle. A line that had beauty must show life and go. Nature always furnished lines that really could not be described; they changed so suddenly and subtly. If they looked at a Japanese screen, they would see what wonderful things could be done with a line. He illustrated this by means of the "hand line." Nature, he believed, suggested everything to the old masters. He was looking at some trees recently planted in the Leazes Park, and seen against the evening sky, they formed in appearance perfect finials and crockets. Some

beautiful foliage, in wood carving, was spoiled in the design by showing the end of the stem. The end should be tucked in, or lost behind the leaves. In some of the old work there had been a strong effort to make the branches and stems as natural as possible, with the leaves conventional. This he held to be the wrong way. In cases where the foliage was running round the caps, the stems could be shown prominent; but the end of the stem should be hidden by all means. Rules and laws cramped art, at least in decoration. Make a rule, and art would invariably cease. It could not be confined; it must have freedom. The distinct characteristics, however, of the style of architectural ornament, Classic or Gothic, might be adhered to, but without carving every piece exactly alike year after year. Here individuality should exert itself. The schools of art all over the United Kingdom during the last two decades had helped to remove much of the old conventional methods and rules, and to spread a healthier taste. What could pass muster twenty or thirty years ago would not be tolerated now. There were the panels in sideboards, with carved dead game hung up by their feet, tied to a most realistic nail, all most elaborately worked in alto-relievo. Then there was the everlasting bunch of grapes, also in alto-relievo, also tied to a nail with a piece of string. Mirror frames were decorated with dead game and fruit, just "chucked" on—he could find no better word to express this now, he hoped, defunct manner of decoration. At that period everything was marked by a distinct absence of design or motive. Carpets and wall-papers were not treated in a flat design, but with deep shadows, the foliage standing up, so that people, until they got used to it, had to lift their feet carefully for fear of being tripped up. The wall-papers had anything but a flat surface in appearance. Some people had an idea that carving should be smooth and polished and bright, others that it should be hard and sharp. A very common idea was that good carving might be judged by feeling it with the fingers, that it ought to be cutting and prickly to the touch. He maintained that carving should be neither, yet both. It should be crisp in parts, it might even be smooth in parts, or it might be hard and sharp; but it ought to be art, and done with power, delicacy and feeling. A carver with the advantages of education, knowing the style of decoration, its position in relation to architecture, the art temperament would soon tell him where power, strength, delicacy or high finish were required. Time spent in highly finishing every part of a piece of foliage was very often worse than lost. He had seen a great many instances of this by carvers of high repute, whose work looked as if it had been cast out of an old worn-out mould, and had much the appearance of putty. There was as much art in knowing where to stop as where to begin. In conclusion he desired to give them his view on colour decoration. He held strong views on that point, and, with their permission, he would venture to ventilate them. Of course he referred only to wood carving, not flat or plain surfaces. Take, for instance, the plain petal of a tulip. It was striped with colour; also the flat pansy; but the rose and other delicately moulded flowers were of a gentle blending of one colour. Gilding carved oak was the only form he could bring himself to relish. This, if done properly, showed all the grain of the wood and all the crisp tool marks, and looked what it was—a gilded carving. The carving should be coated two or three times with size before gilding, not painted and gilded. Some had the idea that to prepare a carving for gilding it should be coated two or three times with paint or whitening, then sand-papered and smoothed down, with a few scratches here and there to give effect, and this, also, looked like gilded putty, and not like what people would have others believe solid gold. Everything ought to look like what it was; therefore, if a carving was to be gilded, let the wood assert itself. When oak must be decorated with colour, he thought stains should be used for the grounds or fields, with the design or pattern painted upon it. He had seen a carved reredos so decorated that all the projections and shadows were lost; it might have been painted on a flat board. He expected they would say the old masters decorated their carvings. He had seen foliage painted a subtle green, with yellow flowers, and he would admit that he was taken with it. But how much of the effect was due to age he was not prepared to say. He knew that two-thirds of the paint had been worn off, showing the oak here and there with advantage. He questioned whether it would look so well when new. Time, the softener of all things, had done its part in dealing with all the old masters. In coloured decorations colours always got lower in tone. The crude blue three or four hundred years old became yellow; so also with the reds, making the mellow colour we so much admired. Time was not the only softener of wood carving. Old oak chests, buffets, panellings, chairs, &c., could in some parts of London be made to order. After the old furniture was made and carved, it was scraped with a wire brush, to take off the hard edges. The wire brush removed the soft part of the grain of the wood. Thus was done in an hour what would take a century and a half to accomplish. The furniture was then fired at with dust shot out of a gun, and the

small holes so caused were filled up with dust from worm-eaten wood. The whole was then stained very dark with liquid ammonia or fumigated. The collector was very often deceived with this. He generally canted the piece of furniture on one side, tapped it with his hand, and if dust came out of the shot holes he thought it was an old and genuine article. He had seen all this done, but as a rule the makers of old furniture missed something. He had seen a very good imitation of an Elizabethan cabinet, with the exception that the iron hinges were put on with screws. If they had used wrought-iron nails, and clenched them at the back, it might have passed. But Brummagem nails were rather too modern. Henry Blackburn, in speaking of some old woodwork in Normandy and Brittany, said it was held together with nails all clinched at the back, intending that it should remain. He said, further, that screws always suggested that they could be taken away with a screw-driver, but that work fastened with good strong wrought nails could not be removed without breaking and destroying the work. The old masters were not always correct, especially in their costumes and accessories. He remembered once having to design a St. Jerome. He had his own idea of the costume, but the architect questioned his authority, and said the old masters were right. The old masters dressed their saints in garbs of their own time, and he said that if they were right, he was justified in dressing his St. Jerome in a frock coat, and if he wanted, with a high hat and umbrella. They had now every opportunity of research in architectural museums, of which they should take every advantage. In art, no one could begin where another left off. Could anyone build on such structures as the old masters had left? No. They could not pile up on the top of other men's work; they must make a foundation of their own, and build upon that.

THE NATIONAL GALLERY.

THE annual report by Sir Frederick Burton on the National Gallery for the year 1893 has appeared. It states that the pictures which have been purchased out of the Parliamentary grant in aid and out of the Clarke bequest during the past year are seven in number, and consist of *Soldiers Quarrelling over their Booty and Players at Tric-Trac*, both by Duyster, bought for 1,250*l.*; *View on the Shore at Scheveningen* (Ruysdael), 3,045*l.*; *Portraits of Mr. and Mrs. W. Lindow* (Romney), 735*l.*; *Beatrix Knighting Esmond* (Egg), 105*l.*; *The Cast Shoe* (Mason), 682*l.* 10*s.*; and *Chilston Lane, Torquay* (Willcock), 50*l.* The bequests and donations to the gallery include *A View in Hampshire*, by Nasmyth; *The Harbour of Refuge*, by Walker; and *Christ Washing St. Peter's Feet*, by Ford Madox Brown. Three pictures by Sir Joshua Reynolds belonging to the Dilettanti Society, viz. two portrait groups and a bust portrait of Sir Joshua Reynolds, which had been on loan in the National Gallery since 1886, were reclaimed by the Society in April last.

The trustees and director renew the appeal which they made in last year's report respecting the urgent necessity for erecting additional rooms at the National Gallery. The acquisition of fresh pictures annually increases that necessity. In the absence of adequate wall space, the only possible mode of providing accommodation for the works in question was the use of hanging screens. But this expedient has now reached its utmost limit, and if the present system of classification is to be maintained there is absolutely no more room available. The Government intimated the intention of devoting to the extension of the National Gallery buildings a portion of the site now occupied by St. George's Barracks as soon as the soldiers' quarters have been transferred to Millbank. But some years must necessarily elapse before the new barracks can be built. In these circumstances, the trustees and director call attention to a suggestion made in the last report, viz. that at least a portion of the present barrack drill-ground should be given up at once for the purpose required, and that the National Gallery should be enlarged without further delay.

The gallery was visited by 486,746 persons on the public days during the year, showing a daily average attendance on such days (207 in number) of 2,351. On students' days (Thursdays and Fridays) 38,976 persons were admitted between January 1 and December 31, 1893; the admission fees (at 6*d.* each) amounting to 974*l.* 8*s.*, as compared with 1,048*l.* 14*s.* received in 1892. The amount annually realised by admission fees is devoted as an "appropriation in aid" of the Parliamentary vote to the National Gallery.

The total number of students' attendances at the National Gallery on Thursdays and Fridays throughout the year was 20,936. Independently of partial studies, 971 oil-colour copies of pictures have been made, viz. 402 from the works of 87 old masters, and 569 from the works of 49 modern painters.

Among the foreign artists copied Greuze takes precedence, for his *Girl with an Apple* was copied sixteen times, and his *Head of a Girl* eleven times. Romney holds a similar rank among the moderns, for his *Parson's Daughter* was copied nineteen times and his *Lady Hamilton* fifteen times.

THE CAVES AT MENTONE.

IN a communication to the *Scotsman*, Mr. J. E. Somerville writes:—Much has been written about the Mentone caves, and yet their interest is by no means exhausted. Two years ago the scientific world was startled by the announcement of the discovery of three prehistoric skeletons in the Barma Grande, the deepest of several caves in the Baoussé Roussé—or red rocks—which form the eastern or Italian side of the Bay of Mentone. The skeletons were lying side by side, at a depth of 24 feet beneath the original soil of the cave. All were above ordinary stature, and one was gigantic, measuring as nearly as can be estimated 7 feet. The skulls were of the dolichocephalic or long-headed type, and were remarkable for their large facial angle, good frontal development and square orbits.

Three weeks ago, in removing soil from the cave for his garden, the owner of the quarry came upon another human skeleton. This time precautions were taken and several scientific persons, among whom were Mr. Arthur Evans and Mr. Drury Fortnum, V.P. of the Society of Antiquaries, London, were present while it was being unearthed. This was done with great care and occupied many hours. The present find lies 13 feet further in the cave than the former skeleton and at a level of 6 feet above them—that is to say, 19 feet below the original floor of the cave. Ten inches of soil had been removed, consisting of burnt earth and the remains of charcoal hearth, which I had seen some weeks before. Above the middle of the body lay a large stone 28 inches by 27, 7 inches thick, rounded above and flat below, which suggested the idea of a small dolmen. This, however, it was not. One cannot be certain whether the stone had been placed there at the time of the burial or had fallen off the side of the cavern. Between the stone and the skeleton was about 6 inches of earth, in which were many bones of birds and the jaws of rodents (*arvicola*) of several species, and the stump of a deer's horn (*C. elephas*) with a piece of the skull attached.

The skeleton lies along the eastern side of the cave, with its head towards the opening; those of two years ago lay across the cave, with their heads to the eastern wall. It lies, like them, on its left side, in a somewhat curved position; the right leg crosses over the other at the tibia, the right arm is extended outwards, the left is bent up towards the head. The skull, which had been broken by the pick, is of the same type as the others, with broad, high forehead, strong jaws and pronounced supraorbital ridges and square orbits. The face is broad, measuring 5½ inches between the upper external angles of the orbits. All the teeth, including the wisdom teeth, are present in sound condition, but with the crowns much worn down. So we infer the individual to have been a man past middle age. Near the back of the skull a small flint knife was found, 4 inches long, and a minute carved bone ornament like a button. Round the head lies a row of shells of *Cypræa*, 1½ inches long, decayed so as to be unrecognisable. Beside them are a number of the canine teeth of deer, pierced through the sides. On the middle of the forehead, and adhering to the skull, are a number of small shells of *Nassa neritæ*, pierced in similar fashion. The shells and teeth evidently formed necklaces or chaplets. It is interesting to find these canine teeth of the deer employed for decorative purposes. The North American Indian of to-day whenever he kills a wapiti immediately draws the four canine teeth, and treasures them as charms. The prehistoric cave-dwellers seem to have had similar ideas. Only a small particle of ochre was found about the skeleton. This substance was spread in great abundance under and around the skeletons formerly discovered. Indeed, they seemed to have been laid in a kind of hollow lined with this substance, which has quite discoloured the bones. It is thought that the ochre was buried along with the corpse that in the other world the owner might have material wherewith to paint his body, as the Kaffirs do at the present day. In the middle of the breast, below the chin, and at the extremity of the left hand, lay a large natural crystal, 3½ inches long, of carbonate of lime, such as are common in the rocks around. From its position it is inferred that it served some superstitious or religious purpose. From the presence of these things, as well as from the flint implement buried with the dead, we get faint glimpses of the religious notions of these ancient cave-dwellers. Like all the other skeletons that have been found in this cave, this one is of large proportions. The individual probably stood 6 feet 2 inches, though it is difficult to estimate the height exactly. The femur is 18 inches long; that of the giant found here two years ago is 20½. I managed with some difficulty, and with the aid of magnesium light, to take a photograph of the figure as it lay. The breadth of the face is well brought out in it.

For some weeks the workmen have been digging down to find the rock-floor of the cave at its mouth, and have run a mine into the soil. They are now working at a depth of 22 feet below the level of the skeletons; that is to say, 40 feet beneath the surface of the soil before excavations were commenced, and yet the rock has not been reached. The earth is full of the

bones and teeth of animals. Already there have appeared those of the woolly rhinoceros, cave hyæna, fossil horse, and the tusk and huge vertebrae and pelvis of an elephant or mammoth. Of the last, 2½ feet are visible, and the acetabulum, or socket for the head of the thigh, measures 9½ inches in diameter. Both above and for 18 inches below this bone are lines of charcoal, evidence of the early hearths of human beings who in all probability feasted on this elephant. The bone shows indication of having been partly burned in roasting. Lying beside the vertebrae of the elephant was a fine flint implement, 4½ inches long and 2½ wide, with a sharp-cutting edge, and with one of its sloping sides flatter than the other, as if to be held in the hand between the fingers and the ball of the thumb. Mr. Evans said it resembled the type of instrument now or but recently employed by the Maoris of New Zealand for cutting notches in the stem of a tree they wished to ascend.

In the cave no metal has been found, nor any vestige of pottery, nor is there any weapon of polished stone. Though the ornaments around the skeletons and the bones near them seem to point to a Neolithic race, the tools are all of the chipped order, and indicate an earlier age, one for which Professor Issel, of Genoa, has invented the name of Miolithic. But who were the men that ate the elephant, and who have left the traces of their fireplaces so well marked in the deep soil, and of what race was the man that used the flint tool found beside the elephant's vertebrae? Assuredly Palæolithic. The whole soil of the cave is full of bones, entire or split for the extraction of the marrow. In the upper strata they are mostly of species used for food, *Bos primigenius*, *Cervus* of three species, ibex, boar, &c. Lower down they are mixed, herbivorous and carnivorous. Throughout the soil fragments of flint are very numerous, though perfectly-formed tools are not plentiful. In the lower strata the chips are larger and coarser than those of the upper beds. So numerous are the flakes and cores that the cave would seem to have been used for a long series of generations as a manufactory of such implements. The material was probably derived from beds which are found not far off on the hills above, near which ochre is also found. The flint occurs in two kinds of places—sometimes embedded in the hard conglomerate, a thick stratum of which runs parallel with the coast; sometimes lying loose in a sandy, calcareous soil, in which it appears to have been segregated.

CIVIC ARCHITECTURE.

LECTURE was given by Alderman P. H. Rathbone before a very large and crowded audience at the Picton Lecture Hall, Liverpool, on "The Public Buildings of Liverpool and other Great Cities of the World." In the course of his lecture he said:—

The importance of cities having really fine buildings is very great, but I don't think we in England sufficiently realise it. To the city in which it is situated a really fine building is a permanent source of wealth. In the first place, it is a public announcement that round it are grouped an intelligent and industrious population, who had the power and sense to build it. A great public building is not only a source of wealth, but a bond between all classes. Unlike a book or a great picture, it cannot be the work of a single man. The genius of the architect requires the assistance of great and varied skill. Such a building has an element of permanence which is of great value to the prosperity of a city. Most great cities have understood this, and those which have not have practically passed away. Antioch was larger and richer than Athens, but how different has been the influence of the two cities. It is a discussion where Carthage was situated, while Rome is still one of the great cities of the world. The poorest citizen feels that a great public building belongs to him as well as to the richest and most powerful of his fellow citizens. The artisans feel that they made it; they helped, they or their forefathers, to pay for it. Therefore they are proud of it—are proud of being citizens of the town which has raised it. As Englishmen, we are proud of the Houses of Parliament. We compare them with the Chamber of Deputies in Paris, and we feel their noble architecture to be a proof that we are proud of our Parliamentary institutions, with their long history and unbroken power. The Parisian is proud of being a Parisian. Paris believes in Paris, and therefore it is that the Town Hall of Paris, not the Chamber of Deputies, is the great building of their city. They spared neither expense nor genius nor energy in making their Town Hall the finest in the world. If you would inquire which cities in England have most life and vigour, you will find them to be those which are raising noble public buildings to declare their present prosperity and insure their future duration. But this cannot be accomplished without the aid of educated artisans. It is therefore the duty of the city to secure the education of those classes of artisans necessary to insure architectural success. I think we too are

awakening to this.* We are about to establish schools for those arts connected with the mother of them all—architecture; and when they are established I hope the city will be enabled to assist in finding employment for their students. It is very sad to think of the amount of genius in our nation which we know to have been wasted and lost through the absence of opportunities, genius which would have tended to make our nation greater and nobler than it is. However great the genius of an architect may be, he requires the earnest and enthusiastic help of his fellow citizens. Architecture is a national branch of art as distinguished from individual branches. The lecture was illustrated by numerous lantern pictures of famous buildings throughout Europe.

EGYPTIAN ARCHÆOLOGY.

THE following is the third report of the Society for the Preservation of the Monuments of Ancient Egypt; Patron, H.R.H. the Prince of Wales, K.G.; president, the Earl of Wharcliffe:—

In the report presented to the last general meeting of this Society, held on July 14, 1891, the committee were not in a position to do more than give an account of continuous endeavours to carry out the objects for which the Society was formed, without being able to point to any definite success. On this occasion they are glad to be able to show some more satisfactory result of their efforts.

In the report for 1890-91, referred to above, the principal objects for which the Society was striving were stated to be the appointment of an official inspector of monuments and an endeavour to arrest the gradual decay of the Temple of Karnak by means of Grand Bey's scheme for carrying off the inundation water of the Nile.

With negotiations on these subjects still in progress, it was thought advisable to postpone any general meeting of the Society until a satisfactory and definite statement that something had been achieved could be produced.

It will now be a source of great satisfaction to the members of the Society that the first of these two objects has been attained, and that the second is in a fair way to be carried out after many unavoidable delays.

The committee having received no further information with reference to the appointment of two inspectors of monuments, which, as detailed in the report for 1890-91, had been promised by the Egyptian Government, and learning that M. Grébaut had resigned his post of director-general of the Gizeh Museum at Cairo, and that a new director, M. de Morgan had been appointed in his place, and had turned his attention to this subject, addressed a letter to the Earl of Rosebery on September 26, 1892, inquiring whether the promised inspectors had been appointed, and if so, what was the nature of the duties entrusted to them, and on October 20 Sir Philip Currie was good enough to forward to the hon. secretary of the Society a despatch from the Acting British Agent Consul-General at Cairo, detailing the steps that had been taken.

Mr. Hardinge's despatch, communicated by Lord Rosebery's instructions, is as follows:—

Cairo: October 29, 1892.

My Lord,—I have the honour to report, in reply to your lordship's despatch, No. 139 of the 29th ult., that on returning to Cairo I made inquiries of M. de Morgan, the newly-appointed director-general of the Gizeh Museum, respecting the steps taken up to the present for the more efficient protection of Egyptian monuments.

M. de Morgan informs me that the two inspectors, referred to in the letter dated the 26th ult. from the Society for the Preservation of the Monuments of Ancient Egypt, have already been appointed with the title of inspector-general. One of them is a Frenchman, M. Foucard; the other a native of Egypt, named Ahmed Effendi Najib. Each is to have alternate charge for a year at a time of Lower and Upper Egypt: thus, one year M. Foucard will inspect Lower Egypt, and Ahmed Effendi Upper Egypt, and in the following year they will interchange Provinces. Their duty is to visit all monuments and other objects of interest to the Egyptologist in their respective Provinces, and to appoint and superintend sub-inspectors, each of whom is to be responsible for the preservation of the antiquities situated within a given radius assigned to him. Provision has so far been made for twelve of these sub-inspectors. The following are their head-quarters:—Tantah, Zagazig, Medinet-el-Fayoum, Rodah, Akkum, Abydos, Denderah, Gurnah, Luxor, Edfou. By a Khedivial decree of August 1 last they were created "officiers de police judiciaire." This enables them to arrest in case of "flagrant délit," on condition of taking the offender within twenty-four hours before the nearest tribunal. If there is no "flagrant délit" they can draw up a "procès verbal" without further police assistance, and it will be received as evidence by the "Parquet."

I have, &c.

(Signed) ARTHUR HARDINGE.

This may, the committee think, be taken as a very satisfactory result of the efforts the Society had been making for nearly four years to obtain a proper system of inspection, which should prevent the recurrence of such disgraceful mutilations as took place at Beni-Hassan in 1889.

It is, no doubt, to the activity of the new director-general that these appointments are due. M. de Morgan, as will be seen in the sequel, has shown himself in active sympathy with the objects of the Society, and it is at least to be hoped that the measures taken by him will prove effectual in finally putting a stop, as far as is possible over so extended an area, to the various causes of destruction to the monuments which have been in operation for so many centuries; and the Society may, it is thought, congratulate itself on being the instrument by which primarily this reform has been brought about.

As regards the Temple at Karnak, the aims of the Society have been more difficult of attainment. It was considered advisable before taking any steps towards giving practical effect to Grand Bey's scheme, to obtain an independent report on its efficacy for the purpose intended, and, as stated in the report, 1890-91, negotiations to this effect were opened with Lieutenant H. G. Lyons, R.E., who undertook, if his engagements allowed him, to survey and make a general report on the ruins of Karnak, which should give the information required and could at the same time be circulated to interest the public in the scheme. But Lieutenant Lyons's duties lying higher up the Nile, at Wady Halfa, he was unable to give the time to the work. Under these circumstances Colonel Ross, the head of the Irrigation Department at Cairo, was applied to, and he most kindly made a careful survey and sent a report, accompanied by a sketch-plan and sections, detailing the condition of the various parts of the temple as affected by the incrustation of salt and the movements of the inundation water through the ruins, and showing that Grand Bey's scheme for carrying off the water by a canal would not be practicable on account of certain differences of level which had not been taken into account. Colonel Ross proposed, therefore, that a small steam-engine should be set up to throw the water to the necessary level; it could then be carried away to the Nile by a channel to be dug for the purpose. This report was accepted by the committee on May 24, 1892, and Colonel Ross was asked to supply a detailed estimate of the cost of the proposed engine and other necessary works.

Unfortunately, at this time Colonel Ross was obliged to give up his appointment as head of the Irrigation Department and leave Egypt on account of ill-health; and the committee consider that the thanks of the Society are due to Colonel Ross for the great trouble he took to survey the ground and prepare a report at a time when he was seriously out of health, and burdened with his departmental duties.

On the advice of Sir Colin Scott Moncrieff, who, at the time that he occupied the post of head of the Public Works Department in Cairo, took an active interest in the affairs of the Society, Major R. H. Brown, of the Irrigation Department, was asked to continue Colonel Ross's work. Major Brown being in England, attended a meeting of the committee on September 6, 1892, and kindly undertook to act in the Society's interests at Karnak in carrying out Colonel Ross's method for washing out the ruins. Major Brown, on his first visit to Karnak, immediately after his return to Egypt in September, being fully occupied with the "High Nile," could do no more than send his impressions, which were that some modification was necessary in Colonel Ross's scheme; subsequently, on a second visit in July of last year, he sent a detailed report, made after a very careful survey of the ruins. Major Brown's report has been printed, and is circulated to members of the Society, together with this paper; it is therefore unnecessary to go into details, but it will be seen that Major Brown's object is to prevent the periodical wetting and drying of the bases of the walls and columns, which has been the cause of the gradual undermining which has gone on for centuries, and has brought down many of the columns. If, as is to be believed, Major Brown's scheme is successful (and he seems confident that all will be ready for work during the inundation of 1894), the second main object for which the Society was originally started will have been achieved, and the most magnificent group of ruins in the world, which M. Maspéro is said to have stated could only be abandoned to their fate, will be saved from further decay. A photograph which Major Brown presented to the committee shows that the engine will be placed in an inconspicuous position outside the general mass of the ruins.

The cost of the proposed arrangement was estimated by Major Brown at about 500*l.* for the engine and necessary works for placing it and for conveying away the water, and about 200*l.* a year for keeping the engine at work; but a further sum of 600*l.* would be required to make a permanent building for the engine and for a masonry or iron duct to replace the earth trench for carrying off the water, his object being to keep down the cost until two or three years' experience had proved the satisfactory working of what might be somewhat in the nature of an experiment.

Major Brown's report and estimate were considered at a meeting of the committee on August 1, 1893. The committee felt that they were not in a position to take the permanent charge of working the engine, as it was impossible for them to

guarantee an annual outlay of 200*l.* in perpetuity, and after some discussion the following resolution was adopted unanimously:—"That the committee adopt Major Brown's report and estimate for fixing up and working an engine at Karnak, and are prepared to provide the money for the placing of the engine on the estimate given; and will also provide the money for working the engine for two years, on the assurance that the expenses for continuing the work after that period—that is, the permanent working of the engine for keeping down the flood-water—should be provided by the Egyptian Government, and that if his proposal be agreed to by M. de Morgan, the committee will communicate officially with the Egyptian Government."

It was the greatest satisfaction to the committee to find that M. de Morgan, in a letter which is printed in Major Brown's report, cordially fell in with the Society's views and accepted their assistance, and that he fully agreed with Major Brown's method for keeping down the Nile inundation water, putting his staff at Major Brown's disposal for the execution of the works; and on December 1, 1893, M. de Morgan wrote again that he approved of Major Brown's proposals, and, in answer to the resolution of the committee which had been forwarded to him, that he had "submitted the question to the archaeological committee, being unable to make any engagement for an annual expenditure of 200*l.* for the future without having first received a special authorisation on this point," and that "the committee having approved this expenditure, and having directed him to come to an understanding with the hon. secretary as to the ways and means to be employed for putting the project into execution," he is able to give the authorisation necessary for going on with the work, no application to the Egyptian Government being necessary; and further that he will arrange with Major Brown for a meeting to definitely settle the commencement of operations. On this letter being read to the committee at a meeting on December 20, 1893, Major Brown was authorised to proceed with the work at Karnak as provided for in his estimate and report. A letter subsequently received from Major Brown on January 6 of this year, states that he will proceed at once to make arrangements with M. de Morgan, as everybody is agreed as to what is to be done. He strongly advises at the same time that the permanent form of engine-house and the permanent masonry or iron duct should be made at once, rather than at the end of three years (as then proposed), so as to make a complete job of it, and hand over our gift at the end of the two years in a complete form to the Egyptian Government.

To meet these expenses the Society has in hand about 424*l.* in Cairo, and a balance of about 230*l.* at Messrs. Glyn, Mills & Currie's bank, and it will be necessary to appeal to the public for further funds. It is important to note on this point that since the general meeting in July 1891 no efforts have been made to collect fresh funds, and that those members of the Society who had promised annual subscriptions, and have paid them irregularly or not at all, have not been appealed to. It is obvious that until the committee were certain of being able to carry out their wishes with regard to Karnak, on which the original appeal to the public was made, it would not have been fair to collect further sums. Now, however, that all difficulties have been smoothed away, and that the delays which, as will have been seen from this report, have been unavoidable are pretty certainly at an end, a call will be made for promised annual contributions, and a circular will be sent round to members to that effect. Meantime, the thanks of the committee are due to those subscribers who have continued their annual payments—their money will certainly be used to good purpose.

A letter from Sir Colin Moncrieff, dated Cairo, December 9, 1891, was received, in which he drew attention to the perilous condition of the Great Rock Temple at Abu Simbel, well known by the four colossal figures of Rameses II., which overlooks the Nile. An alarming report had been received by him that the whole ledge of rock overhanging the left-hand statue "has advanced forward, and 270 cubic metres of rock are displaced from a half metre to three metres, the temple being in imminent danger," and estimating the cost of preventive measures at 1,000*l.* Sir Colin, after consulting with General Grenfell, decided to ask the Society to devote the 500*l.*, which were in the hands of the treasurer to the Society in Cairo, towards works for arresting this dangerous displacement. This letter was read and discussed at a meeting of the committee, held on January 6, 1892, and it was resolved to telegraph to Sir Colin Moncrieff that the Society placed 250*l.* at his disposal if the Egyptian Government would contribute a like sum. It was thought that 500*l.* would probably be sufficient to stave off immediate danger, and that the Egyptian Government, having at that time ample funds at their disposal, would be in a position to carry the work on to its completion. A letter was also written to the same effect to Lord Salisbury, asking him to communicate the Society's proposal officially to the Egyptian Government. On February 2 the gratifying announcement was forwarded by Lord Salisbury that "Captain Johnstone and a party of sappers would proceed at once to Abu Simbel to

conduct the works necessary to insure the safety of the colossal statues," and that the Egyptian Government would provide the necessary funds, and will not find it necessary to utilise the 250*l.* offered by the Society. Sir Colin wrote in May that the work entrusted to Captain Johnstone and twelve English sappers had been carried out with complete success, at the cost of 420*l.*, which the Egyptian Government had paid.

About the same time Sir Colin Moncrieff, whose continued active interest in the affairs of the Society while he was head of the Public Works Department in Cairo cannot be too highly esteemed, wrote proposing that the Society should spend 68*l.* in enclosing and otherwise protecting a valuable and interesting pavement, discovered by Mr. Petrie at Tel-el-Amarna. It appeared to the committee that this was a work which came well within the functions of the Society, and Sir Colin's proposal was approved; and in May Sir Colin wrote that the protecting roof and enclosure had been completed, at a cost of 81*l.* 1*s.*, under Major Brown's superintendence, with possibly a pound or two more to spend. This expenditure leaves, as has been stated, about 424*l.* in the treasurer's hands at Cairo.

Meanwhile, the preposterous scheme for forming a lake or reservoir at Philæ was not forgotten, and some communications passed between the committee and the Foreign Office on the subject. In December, 1891, a letter from Sir Ed. Baring (Lord Cromer) was courteously forwarded to the hon. sec. from the Foreign Office, in which he expressed his hope and belief that means will be found to improve the water-supply of Egypt without having recourse to the plan which involves the submersion at Philæ; and a promise was given that the earliest information should be afforded the committee of the appointment of the intended International Commission of experts who were to consider the question. It being understood that nothing would be undertaken until this Commission had thoroughly examined into the numerous schemes for storing the water of the High Nile, it was decided to put off for the time the preparation of a public memorial to the Khedive, which had been decided on by the committee. A recent telegram in the *Times* shows that the Philæ scheme has not only not been abandoned, but has been prominently put forward with the approval of M. Garstin, who has succeeded Sir Colin Moncrieff as Under-Secretary for Public Works in Cairo. The hon. secretary has applied for information to Lord Rosebery as to whether the promised commission will be appointed to consider this barbarous scheme before anything is decided upon, or whether the matter rests with M. Garstin to decide. In any case the committee are prepared to take all steps possible to protest vigorously against so outrageous and wanton an act of destruction.

The committee have again to thank the Marquis of Salisbury and the Earl of Rosebery for their courteous communications on this and other matters, and for the full information supplied on all points on which the committee have had occasion to make inquiries.

Sir Colin Moncrieff, having left Egypt for good in the summer of 1892, announced to the committee at a meeting in September, that he must resign the position of hon. treasurer to the Society's fund in Egypt, which he had kindly undertaken, and suggested that Major Brown be asked to succeed him. Major Brown, who was present at the meeting, expressed himself willing to undertake the duties, and he was appointed hon. treasurer in Sir Colin's place.

The names of Prof. J. H. Middleton, Major R. H. Brown, M. de Morgan, Mr. Percy E. Newberry and Mr. Vincent Robinson have been added to the committee since the last general meeting. The death of Sir William Gregory has deprived the committee of the services of one who took great interest in the affairs of the Society. His last attendance was on June 6, 1892.

The financial position of the Society is satisfactory. The money in hand in London and Cairo for the special fund amounts, as stated above, to over 655*l.*, so that the first expense of setting up an engine at Karnak is provided for. The administration fund shows a balance of 39*l.* 14*s.* 7*d.*

Appended are the statements of the hon. treasurers to the Society and the lists of the committee, &c. and other members, and of the subscribers to the special fund.

THE YORKSHIRE COLLEGE, LEEDS.

THE new College Hall and Library and the Medical School, which are being erected by the Council of the Yorkshire College, are rapidly approaching completion. Both are Gothic in style, and will form important additions to the college buildings. They were commenced in 1891, and it was intended that they should be opened in June by the Duke and Duchess of York, but the opening ceremony has been postponed till September. The existing Medical School was established in 1831, and in 1884 the building was purchased by the Yorkshire College, with which the school was then amalgamated. The

number of students at the present time is about two hundred, but the accommodation is inadequate. In the new building there will be ample space for double that number. The school has been erected on the most approved lines, members of the committee having visited most of the medical schools in the country in order to learn what are the best features of each, and these have been adopted in the internal arrangements. The total cost of the site and building will be upwards of 45,000*l.*, and about 18,000*l.* of this sum still remains to be raised. The school has been erected at Mount Pleasant, near the General Infirmary. The building is arranged on three sides only, leaving a large interior court, but allowing of extension on the fourth side if necessary. The college hall and library, the architect of which is Mr. A. Waterhouse, form a central block of the college buildings in College Road, and will cost about 20,000*l.* Hitherto the lecture-room has been used for meetings, and it has been necessary to hire the town hall or some other public building for examinations. The new college hall will serve for both these purposes, and will seat nearly a thousand persons. In a few weeks will be commenced the erection of a fine arts building in connection with the textile department. The estimated cost is 2,000*l.*, which will be defrayed by the Clothworkers' Company. When this building and the college hall and library are completed, the whole of the College Road buildings and site will have cost about 117,000*l.*, of which 35,500*l.* will have been contributed by the Clothworkers' Company; the remainder (except about 10,000*l.* which has still to be raised) has been contributed by the founders and supporters of the college. Altogether there are in the blocks of buildings in College Road 68 rooms used for teaching purposes. In a report which has recently been prepared by the registrar for the Education Department it is stated that the teaching staff comprises in the departments of arts and science 12 professors, 23 lecturers, 16 assistant lecturers and demonstrators, and 11 other assistants—total 62. The department of medicine has 5 professors, 10 lecturers, 6 assistant lecturers and demonstrators, and 4 other assistants—total 25. Last session the number of students in the college, exclusive of medical students, was 901. A day training college for elementary teachers has recently been established as a branch of the college work. Twenty-five male teachers are undergoing training during the present session, the maximum number receivable being 50. The standard of education required for admission has been put somewhat high, candidates having to show that their preliminary education fits them to pursue one of the requisite courses for a University degree. The college has undertaken a very large amount of extension work in all the Ridings.

AUSTRALIAN ARCHITECTS.

IT is impossible to dissociate the unpopularity of the profession of architecture in these colonies, says the *Building and Engineering Journal*, from the blundering and in other cases even the dishonest action of architects who in many cases have even laid bare to the builders the drift of their own aims. It matters not in which direction one turns, there may be found evidences of cruel waste of money, ill-advised construction and hideously-disguised design. In a provincial city which has made great strides in artistic work, which has its art gallery and beautiful statuary in its public places, may be found cathedral "ruins," upon the erection of which some seven or eight thousand pounds have been expended. In a survey of this work we find concrete foundations for a large portion of the building, a crypt in which massive and solid blue stone masonry of finely-chiselled columns and ornate capitals is intermingled with Waurn Ponds stone, and in this partly-finished crypt and these concrete foundations the outline of a structure which would exceed in magnitude either one of the metropolitan cathedrals. Now the building of which these remnants form a part was designed in a competition and was picked from among sets of drawings which provided ample and well-designed and inexpensive accommodation. That which has been commenced at such enormous outlay could not be finished under an expenditure of some hundred thousand pounds, and towards the erection of which on this well known account subscriptions are not now forthcoming. Towards whom is the contempt and indignation of the public turned in such a case, except towards the perhaps unfortunate and in other cases the wilfully misguiding designer and architect? It is but another case to illustrate the wickedly distorted competition system, a system which, even in the hands of the New South Wales Government, has been brought into extreme contempt in the matter of the Rossville Asylum. Tempted under the conditions to produce a fine picture, an imposing perspective, and "estimating" the cost at perhaps less than half the real expenditure for the building, the architect is selected. There are not proper detail drawings, no binding specifications, no safely calculated estimate by reliable builders, and so the slipshod work is commenced and huge sums of money are sunk in initiatory work. Where concrete or brick and cement would

have served for substantial backing there may be found vast blocks of solid masonry, a waste of principal moneys and a yearly loss of interest which would represent a permanent stipend, or a still more useful benevolent fund if properly invested for that purpose. Apart from this the present loss of interest is serious; the works must remain at a standstill for many years, wasting and depreciating under weathering influences, whereas if the 7,000*l.* were invested at compound interest it would be aggregating in a few years a large sum and always inviting increase from donations, which under existing circumstances appear to would-be donors to have no finality. For this the architect is perhaps not to blame, but his advice should always be honestly given so that the sum expended should be so disbursed as to give the earliest possible return in available accommodation, instead of in a portion of the structure which can have no possible value until the whole be completed. It is in such matters and in the cost of the building that professional knowledge should be used to restrain wasteful expenditure instead of a contrary influence being exercised. We may take another ecclesiastical building in the same neighbourhood and inquiring into the details of its construction ascertain that girders imported by a certain firm have been specified. The builder seeks to obtain them from a reputable and metropolitan foundry, points out that they will be far stronger and cheaper, but is told that only the specified firm must be dealt with. The girders supplied are found to be too small; larger sizes are then about to be ordered, but the builder again appeals for the use of the locally made girder, and is told again that he must go to the one importing firm. The girders are so ordered, and when they arrive, much to the builder's surprise are marked plainly as from the aforesaid "foundry," but are charged at many pounds per ton higher than the invoiced price of the same local founders to the builder. Now what inference can possibly be drawn from work like this? What interest can the architect have in making his client pay this extra cost of obtaining goods through a second firm? Appealed to, he explains to the builder, "Oh, I suppose they sometimes exchange stocks," but the local foundry proprietaries are not responsible for the extra price charged upon their girders by the importing firm whom the builders were compelled by the architect to deal with. There can be but one fair course in such matters, and that is the exposure of all such transactions which are bringing an honourable profession into contempt and distrust, and seriously damaging the prospects of those who have ever striven to maintain a high standard of work on perfectly honourable dealings. If there be any line of conduct worthy of special exposure, it must be that which would induce an architect to take "tip" from the supply merchant, when his best services should be at the sole command of his client. There have already been several charges against architects in high positions in these colonies, and many unproved assertions, but it should be to the interests of each to expose and discourage every matter which can possibly indicate even a suspicion of dishonourable conduct. The present dull time is an excellent opportunity for the purification of the profession, and only the fittest should survive the present ordeal of adversity. The fittest should be those whose conduct has ever been above suspicion.

ITALIAN ARCHITECTURE.

A LECTURE on the Italian Renaissance, the sixth of the series, by Mr. William J. Anderson, A.R.I.B.A., was delivered in the Corporation Galleries in connection with the Glasgow School of Art. In continuation of the subject of the last lecture, "The Culmination of the Renaissance," its effects in Venice and the North were discussed, and it was shown to be directly the result of Roman education and bias on the part of its architects. It was a mistake to speak of a Venetian Renaissance school; there were in fact several. The Lombardic school, complete in itself, preceded this central Roman period of Sanmichelì and Sansovino. Palladio of Vicenza and his pupils formed a third distinct variety, while even the seventeenth-century architects did much that was on different lines from any previous work. The chief part of the lecture was occupied by sketches of the lives and works of three of the leading artists and architects of the time (1506-50)—Peruzzi, Sanmichelì and Sansovino. The work of the first-named is characterised by breadth, beauty of proportion, the delicacy and purity of the moulding profiles, and the care bestowed on every detail, nothing being executed at hazard. There is little on a grand scale which attests his power of composition, but by the talents and care he bestowed upon the simplest habitation his artistic capacity is proved quite as much as if his own St. Peter's had been carried to a successful issue. It was in fortification building, remote as may seem its connection with art, that Sanmichelì developed the vigorous simplicity of style which afterwards distinguished him as an artist, tending perhaps to excessive love of mere bigness and extreme severity.

His powers of invention were particularly great, and he left his mark on Venetian architecture to the latest period. These two were in architecture the originating geniuses, and Sansovino, the famous sculptor, was imitator now of one and then of the other. Nothing shows this more clearly than the Mint and Library at Venice, both by Sansovino, the former in a distinctly Sanmicheli manner, while the latter is of a totally different character, and influenced most by Peruzzi's Villa Farnesina at Rome. Generally the culmination of the Renaissance is a great fact in architectural history, and a period quite worthy of comparison with the Periclean age in Greece, the Augustan era of Imperial Rome, and the climax of Mediæval art in France and England. It would be quite unreasonable to claim that it was superior to Greek or Gothic save in certain points, but being comparatively amenable to modern requirements, it touches us to-day more nearly than either. The lecture was attended by a large number of architects and students.

THE ORIGIN OF CHESTER ROWS.

THIS interesting but difficult subject formed the topic of discussion at the last meeting of the Chester Archaeological Society.

The discussion was introduced, says the *Chester Chronicle*, by Dr. T. N. Brushfield, who said it was probable that in the first instance the name of "row" simply meant a line of houses generally devoted to some particular trade or purpose, but when, or at what period, the name was transferred to the present galleried structures in Chester, he could not say. The earliest instance he knew of the name appearing in any printed work was in "King's Vale Royal," by Mr. Smith, which was published in 1590. The rows were there referred to as "galleries which they call rows." As far as the present galleried structures were concerned, those in Chester were quite unique in England, but there could be no doubt that the same kind of elevated footways covered over with houses existed at Kendal and Bridgnorth. The late Dr. Howson stated that he found something of the same kind in Rome, and he (Dr. Brushfield) observed one at Munich. By a general consensus of opinion the row structure had been attributed to the Roman period on two distinct data—the formation of the streets and the arrangement of the houses. When the Romans first came to Chester they fixed their camp upon the slope passing down to the river, and the four main streets of Chester at the present time represented in a great measure the four main roads from the camp. It had been stated on good authority that these streets were formed by being excavated in the solid rock. In the other parts it was found that the present row level, although generally asserted to be the Roman level, was simply a mass of *débris*, an accumulation of rubbish of several successive centuries. He had three separate data for asserting that the Roman level was not the present row level, but coincident with the present level of the streets—certainly Watergate and Bridge Streets. His own opinion was that the present street level was the original Roman level, and the row level was due to the elevation of the ground by the gradual accumulation of rubbish. At the commencement of the thirteenth century a new style of house was erected which had cellars and crypts for the preservation of merchandise goods. He did not think for a moment that the present row structures could be fairly attributed to Roman origin. One theory that had met with a great amount of support from authors, even including Ormerod, was that the rows were erected for the purposes of defence, more especially against the Welsh. Hemingway thought they were erected as shelters for traders and their goods from summer heat and winter's storms. The rows being erected, they were used for a variety of purposes, including, of course, protection from the weather. Parker suggested that the celebrated rows owed their origin to this circumstance, that in rebuilding the town after the Great Fire, it was found more convenient to make a footway and a sort of bazaar over the shops and upon the top of the vaults or cellars. His (Dr. Brushfield's) opinion was that the rows owed their peculiar construction to two separate causes. First, to the elevation of the site occupied by them, and secondly, to the character of the buildings. No explanation that he had seen alluded to the original existence of those footways simultaneously with the early formation of the streets. One theory that found acceptance was that they were constructed through the first floors of the houses, each inhabitant surrendering to the public good the best portion of the best room of his house. Apart from the improbability of this statement, it had no basis in history or tradition. There were reasonable grounds for assuming that those ways existed from an earlier period, and that their incorporation into the present rows was a gradual process coincident with the slow elevation of the ground in which the present roadways did not participate, and that the crypts extending beneath them were one of the consequences of such elevation, and not the cause. Dr. Brushfield pointed out that some of the projecting tops were self-supporting, whilst others were supported by props of timber.

Canon Morris, D.D., said the earliest mention he had been able to find of the rows, in some records he had searched, was dated 1301. The question arose in talking about the rows, Were not those early rows much the same as Paternoster Row, and other rows in other cities? His opinion was that the order of the building and the formation of the rows was first that shops, small shops, lined the streets; and then, as trade began to increase, there came a better class of shops on the row level; and with the further improvement of trade they built another floor above the house and the shop.

After Mr. E. W. Cox had spoken on the subject, Mr. Henry Taylor said it seemed to be generally admitted that the rows were in existence in Edwardian times. Dr. Brushfield had referred to the views of the late Mr. Thomas Hughes on the origin of the rows. Mr. Hughes modified his views, but at any rate he concurred with Ormerod and Archdeacon Rogers on the possibility of the rows being used as a means of defence, particularly against the Welsh. Both Dr. Brushfield and Mr. Hewitt seemed to agree that the poor Saxon builder could not have had anything to do with the building of those houses and rows. Now in 1862 a number of Saxon coins were discovered in St. John's Church, and Mr. Hughes read an able paper on them. One of the coins was of the date of King Edward the Elder, the son of Alfred the Great, who reigned from 901 to 925. Dr. Brushfield said Chester was restored in 907. Mr. Hughes, describing the coins, said that on the reverse was a "representation of a Saxon house of some pretensions, from which we can glean a notion of the prevailing style of domestic architecture. It appears to be a house of three storeys, the second resembling our Chester rows, with the front to the street supported upon arches, as is still the case in several instances around us." The rows, as rows, must have existed from Edwardian times, and he could not help thinking that the poor Saxon might have contributed in some measure to the general idea.

Mr. Hewitt, who read the first paper on the subject at the previous meeting, said that the figure on the coin appeared to be more like a "casket" than a house. Dr. Brushfield said he thought it more like a massive tower than anything else.

The Chairman thanked the speakers at the close.

LEEDS ARCHITECTURAL SOCIETY.

MR. D. B. NIVEN, architect, London, delivered a lecture in the Law Institute, Leeds, before the members of the Leeds and Yorkshire Architectural Society, on "Como Cathedral; its Makers and its Influences." Mr. G. B. Bulmer, president of the Society, occupied the chair.

Mr. Niven, in the course of some preliminary observations, showed that Como Cathedral was commenced amid great difficulties, and he dwelt on the enthusiasm with which all classes of the people combined to raise the money necessary to carry out the work. The building, he said, was commenced by Lorenzo de Spazi in 1396. The first design was Gothic in character, and the west front, as well as the interior of the nave, still remained to show the intention of the original designers. Commenting on Bramante's connection with the work, he said that although this great architect had influenced the design of the whole building, he had only actually carried out a comparatively small portion of it. Bramante was entrusted with the work early in the period of the Renaissance, and prepared the design for the covering-in of the uncompleted portions of the Gothic church in the new manner; but so cleverly was this done that his work, although Classic in detail, was Gothic in character, the fusion of the styles in this building being most happy. The lecturer proceeded to show how Bramante's design was influenced, not only by the Gothic lines on which he had to work, but also by the fact that he had originally been trained as a painter. He had closely studied the Roman and other Classical remains, and this had given breadth and dignity to his work, and this Mr. Niven showed to have been the practice of many of the old masters, who not only studied the remains of antiquity for their detail, but compared one building with another in order to arrive at true ideas of proportion. Bramante had grasped these principles thoroughly, and much of his work was dependent on this early study. After Bramante, the work was continued by two gifted brothers, Tomasso and Jacopo Rodario, who continued it on the lines which Bramante had laid down, but with the freedom and originality in actual design characteristic of that period. In conclusion, Mr. Niven referred to the far-reaching effects of Como Cathedral, showing how it had influenced much of the Renaissance work in the North of Italy, and also how, in all probability, the delicate detail of the work of the French Renaissance could be traced to this source. In Spain, too, there were many indications still existing of designs based on the work of Como.

The British Archaeological Association will meet this year in Manchester.



Income Tax from 5s. to 20s. in the £.

SIR,—Most people will be surprised to hear that the income tax on one class of income generally amounts to the above figures, and often much above. The income I speak of is the tax on landlord's income, when derived from houses let on three years, yearly, or shorter tenancies, and if the property be subject to a mortgage and ground-rent it will be found to amount to the above amount in the £. I will give the case of a house let at £50 per annum, on which the owner has a mortgage of £500, subject to a ground-rent of £8 per annum, quite the usual suburban house.

A tax of 7d. in the £ is paid on the £50, which amounts to	£1 9 2
And of this he receives from his mortgagees as his income tax on the interest £25	£0 14 7
From the ground landlord on £8	0 4 8
	0 19 3
Leaving	£0 9 11

that being the amount of 7d. in the £, the leaseholder has to pay on his income, supposed to be £17 per annum.

I must now estimate the amounts he has to pay out of his gross profit. In the first place the house must be let, and my experience is that a change takes place every five years.

The agent's fee for letting the house would be 50s. This distributed over five years would be per annum	£0 10 0
Outside painting (every three years £5) per annum	1 13 4
The roofs and drains would average per annum	1 0 0
Fire insurance per annum	0 7 6
Decorations (every six years £30—often after three years) per annum	5 0 0
A fund must be arranged in some way for depreciation of lease by efflux of time (say 10s. per £100 per annum), and taking the cost of the house at the amount of the mortgage £500	2 10 0
Empties and cost of collecting, at least, per annum	4 0 0
	£15 0 10

Thus,

One year's rental	£50 0 0
Interest on £500	£25 0 0
Ground rent	8 0 0
Expenses as above	15 0 10
	48 0 10

Leaves an actual profit of £1 19 2

On which an income-tax of 9s. 11d. is paid, or at the rate of 5s. in the £.

Or, if the house be let at £45 per annum, which is not unusual, there is a loss of about £2 17s. 11d. per annum to the unfortunate leaseholder, and yet he has to pay an income tax of 7s.

Now, supposing the above house held by an owner having no mortgage on it, in that case the income tax would be 9½d. in the £, and if held by the freeholder without mortgage, 8½d. in the £. This alone will show the unfairness of the tax as now levied. It is the one business where the tax is levied upon the gross income, no allowance being made for losses or working expenses. These are not fancy cases. The houses can be shown and the income and outgoings proved. There would be no trouble to find thousands of similar houses within five miles of Charing Cross, where the leaseholder is paying income tax of over 20s. in the £ after the fair deductions, as allowed in other businesses, are taken off the gross income.

There can be no question about the tax being unjust, and the least that can be done to relieve the owners of this class of property is that the tax be collected on the rateable value, or five-sixths of the rent paid to the landlord. It works out quite differently with high-class property let on lease, therefore making it more unfair, as the landlord only allows the income tax to be deducted on the amount received. Where the tenant takes on a repairing lease there is scarcely any loss of rent, as the changes are much less frequent, no repairs, no insurance; in fact, the landlord has only to provide a sinking fund to recoup the money that the house cost him, which, of course, must come out of the rent received, as the whole property goes to the freeholder at the end of the lease.

Trusting you will give the above your consideration and do what you can to remedy this glaring injustice,—I remain, Sir, yours truly,

E. ESTCOURT,

8 Canfield Gardens, Hampstead.

GENERAL.

The Annual Exhibition of pictures at the Manchester Academy of Fine Arts was opened on Wednesday, the 21st inst.

The Sixty-eighth Exhibition of the Royal Scottish Academy was opened on Saturday last.

The Spring Exhibition was opened on Monday in the Leeds City Art Gallery. The collection is hardly representative, owing to the increasing difficulties of getting Royal Academicians to lend their works for exhibition in the provinces.

At the Meeting of the Dublin Arts Club on Thursday (yesterday), Mr. W. Booth Pearsall read a short paper on "John Constable, R.A.," which was illustrated with sketches, studies and lantern illustrations.

Mr. L. F. Day delivered a lecture on "Ornamental Offshoots of the Italian Renaissance" in the Art Museum, Nottingham, on Friday last.

The Council of the Sanitary Institute have accepted an invitation received from the Lord Mayor and citizens of Liverpool, to hold their next congress and exhibition in that city in the autumn of this year.

The City Commission of Sewers have decided to authorise the sanitary committee to conclude arrangements with the almoners of Christ's Hospital for the carrying out of a modified scheme of sanitary reform at the school. The almoners will at once ask the consent of the Charity Commissioners to the outlay, and if this is obtained the work will be proceeded with as speedily as possible, and a large number of the boys will return to the school as soon as the scheme has been carried into execution.

The Duc d'Aumale has commissioned MM. Merson and Penne to paint a series of decorative panels for the Pavillon de Blois, Chantilly. The subjects will be hunting scenes of the Condés, from the sixteenth to the nineteenth century.

M. Raoul Verlet has been selected as sculptor of the statue of the late Guy Maupassant, which is to be erected in Paris.

The Committee formed to erect a memorial to the late Dean of Lincoln have decided that the memorial shall take the form of a recumbent statue, to be placed in Lincoln Cathedral, and a window placed in Wantage Church, Berks, where the deceased was formerly vicar.

Mr. G. E. Thompson delivered a lecture at the Walker Art Gallery, Liverpool, entitled "Around the Roman Campagna," illustrated by 120 lantern slides of classical scenes among the hills round Rome—Monte Soracte, rising amid the flat Campagna, and scenes as far south as Naples; the gardens and palaces of Frascati, the lakes of Albano and Nemi, and the Tivoli waterfalls.

The Annual Dinner of the Society of Architects will take place on Tuesday, the 27th inst., and among the guests who will be present may be mentioned Sir James D. Linton, president of the Royal Institute of Painters in Water-Colours; Mr. Wyke Bayliss, F.S.A., Dr. Rentoul, M.P., Mr. W. R. Bousfield, Q.C., M.P., Mr. Atherley-Jones, M.P., Mr. G. Gandy, Q.C., Sir Henry Mance, Dr. Longstaff, chairman of the London County Council's Streets and Buildings Bill Committee; the Rev. Canon G. F. Browne and the Master of the Tylers' and Bricklayers' Company.

Mrs. P. E. Newman will read a paper on "Goldsmiths' Work, Past and Present," before the applied art section of the Society of Arts on Tuesday next.

The London School Board intend to appoint twelve additional woodwork instructors.

A Society of Illustrators is about to be formed and all persons engaged in any branch of the fine and applied arts are eligible for membership. The subscription is half a guinea.

The Manchester Academy of Fine Arts have just held the thirty-fourth annual meeting, Mr. H. Clarence Whaite, president, in the chair. The following were elected officers:—President, H. Clarence Whaite, P.R.C.A.; vice-president, Reginald Barber; members' auditor, William Robinson; hon. treasurer, William Artingstall; hon. secretary, Elias Bancroft; literary secretary, W. Herbert Johnston; hon. auditor, T. Walton Gillibrand; council, John Houghton Hague, Henry Measham, John Cassidy, Miss S. Isabel Dacre and Miss Florence Monkhouse.

Professor H. G. Seeley, F.R.S., has commenced a course of lectures on "The Shaping of the Earth," at Wortley Hall, Seven Sisters Road, N. (adjoining Finsbury Park Station), on Thursday evenings at eight o'clock, as the winter course of the London Geological Field Class.

Papers on "The Liverpool Overhead Railway" and "The Electrical Equipment of the Liverpool Overhead Railway" will be read at the meeting of the Institution of Civil Engineers on Tuesday next.

A Faculty has been issued for the restoration of Lisworney Church, plans for which have been prepared by Messrs. Bruton & Williams, Architects.

The Architect.

THE WEEK.

As England is held responsible for whatever occurs in Egypt, care must be taken to avoid participation in any act, such as the destruction of the temples at Philæ, which is likely to discredit this country for ever. The projected treatment of the buildings on the little island is tantamount to the making away with documents which confer rights. Without the buildings and other ancient structures the place of Egypt in the history of civilisation and of art would be questionable: they form the best title to the esteem of the world. Now the proposed vandalism will destroy for ever one of the best foundations for that claim. There are, it is true, remains which are on a more colossal scale, but at Philæ we find that Egyptian severity was softened, and the massiveness of the columns and other parts of the temples acquired a sort of picturesqueness. The admirers of the buildings are as well aware as the advocates of destruction that the work is far less ancient than what is to be seen elsewhere, but they may be excused if for once they prefer beauty to age. At Philæ the visitor is not so much overpowered by grandeur as charmed by a treatment that seems to be in keeping with the place, and on that account the eagerness to insure the safety of the buildings should be excused even by hydraulic engineers. English engineers have displayed so much ability in overcoming difficulties, we cannot believe that the proposed reservoir is not to be attained without the loss of a treasure which is sure to be more appreciated in proportion as the world grows older.

ONE of the excuses offered for setting up colossal announcements in picturesque parts of the country is, that owing to agricultural depression the farmers are compelled to utilise their fields in any way that will bring in money. A correspondent of *A Beautiful World*, the journal of the society for checking the abuses of public advertising, has been investigating the subject, and discovers that the usual price paid for allowing one of those obnoxious boards to be erected is 10s. In cases where there is a chance of doing particularly widespread mischief, 5s. has been given, but apparently it must be necessary to degrade an exceptionally beautiful landscape for that sum. The rural mind, unfortunately, is disposed to take a sordid view of nature, but we expected that more shrewdness would be shown in dealing with the quack medicine factories. Rents must be low when advertising stations in the best positions can be obtained by a single payment of 10s.

THE offer of 38,000*l.* by Mr. YATES THOMPSON towards the erection of the mortuary chapel at Westminster, which Mr. PEARSON has designed, if not altogether wise, is most liberal. The First Commissioner of Works has displayed prudence in his hesitation about accepting the gift. People may say that if Westminster has not sufficient space to entomb the multitude of great men produced every year in England, all that has to be done is to construct additional buildings. The Abbey is now no more than a place of exhibition which figures on the lists of the shows of London, and the more tombs and ceremonies there are to be seen the more gratification will be derived by sightseers. Men and women who are in want of entertainment have reason to be grateful to any one who will enlarge the spectacle. For the sake of its history the old building has, however, some claims on Englishmen, which should be compared with those of the tourists'. Is it possible to erect additions without some sacrifice of the architectural interest of the Abbey? One class of people we know will assert that Gothic, and especially English Gothic, is so elastic, one of the buildings can be increased or diminished or modernised without the least loss of character. That theory, fortunately, does not gain general acceptance, and although Mr. SHAW-LEFEVRE is not indisposed to have his name associated with novel works, and above all with a Campo Santo, we may assume that he will not

willingly approve of any work which will make the Abbey less characteristic. It would be more judicious to spare the building, and impose a sacrifice on the celebrities. Numerous tombs and memorials are to be seen which cannot preserve the subjects from oblivion. Why not clear them away, and if they must be preserved, set them up in a receptacle beyond the metropolitan boundaries? The removal of marble work which is as useless for the dead as for the living would afford sufficient space for new monuments. The morbid ambition to have plebeian dust mingled with the dust of kings might be satisfied by insisting on the cremation of all those who are deemed worthy of such a resting-place. If, however, new buildings are to be erected to give opportunities to display the resources of the funeral undertakers, would it not be more fitting if the nation supplied the funds? To have to wait for a grave until it is provided at the expense of a stranger is hardly an incentive to noble deeds.

A MEETING of the Institute of Architects was held on Monday evening, when Professor T. ROGER SMITH read a paper written by himself, and three others by Professors J. A. FLEMING, G. CAREY FOSTER and T. HUDSON BEARE (the two latter gentlemen being present) on "The New Engineering and Physical Laboratories at University College." A vote of thanks was duly proposed by Mr. GORDON SMITH and seconded by Professor KERR, the discussion being continued by Professor UNWIN, Messrs. H. H. STATHAM, ELSEY SMITH, WILLIAM WOODWARD, FOSTER HAYWOOD, and Professors CAPPER, CAREY FOSTER and HUDSON BEARE. Since University College was designed by WILKINS, the dome and portico of which are familiar objects to Londoners, the buildings have from time to time been extended by the addition of a south wing designed by Mr. T. HAYTER LEWIS, and later by a north wing carried out from the designs of Messrs. PERRY & REED. The last addition will practically complete the quadrangle, and it is in these new buildings that the laboratories are situated. The papers dealt with the arrangements and plans of the new buildings, modes of construction and materials. The laboratories, with their interior fittings, were described, as also the electric engineering department and interior fittings, and electric plant in the engineering laboratory, the equipment of the mechanical engineering laboratory and workshops, and other details regarding the testing of the materials used in the buildings. Among the official business transacted was the appointment of Mr. W. MARKS as auditor in the place of Mr. MIDDLETON, who had resigned.

THE annual dinner of the Society of Architects took place on Tuesday, and was very successful. Mr. GEORGE HIGHTON presided. The Rev. Canon BROWNE, in responding for the clergy, mentioned that the Dean and Chapter of St. Paul's Cathedral had been occupied with the decoration of the interior of the building, and he was told by a gentleman who had studied the subject that there was not in Europe any mosaic, ancient or modern, which would compare in splendour with that shortly to be seen in the dome. Mr. ATHERLEY JONES, M.P., described the Bill for the registration of architects as destined, when it became law, to contribute to the general welfare of the community. He was not hopeful as to the passing of the measure during the coming session, but he hoped that members of Parliament would do their utmost to secure for the Bill a good place, because it was an undoubted fact that the Bill met with the general approbation of members of Parliament. Mr. WYKE BAYLISS, in proposing success to the Society, said the true architect was a first-rate artist and a first-rate engineer rolled into one. The architect was a magician, who used only a foot-rule, but with it what magic was wrought. Architects were the representatives of the noblest, greatest and divinest of the arts. The President, in responding, said that in 1885 the members numbered 259; last session they had increased to 477. But they must not be content to remain at that number. He recommended a better attendance at the meetings when papers were read and discussed.

COLOURED SCULPTURE.

IN a great many shop windows in London and provincial towns the display of coloured figures has become remarkable. They are mainly produced in Austrian potteries. As examples of modelling they are not without cleverness, although the subjects are rarely of much importance. Moors and negroes abound, and it is possible to obtain figures of as large a party of sooty minstrels as can be seen any day in August at Margate. There are swinging monkeys which can be suspended from ceilings. Figures of Italian shepherd boys are also prepared in such a way that they can be seated on cabinets and pieces of furniture, where they will appear to be piping and confer an air of pastoral *naïveté* on a drawing-room. Apparently this polychrome sculpture has beaten Parian statuettes out of the market. It gratifies the weakness for strong colours which was possessed by men from the least civilised ages, and it is inspired by the craving after naturalism which is a product of the most scientific of all ages. What is the use of a white material when people desire to recall the striped pantaloons of nigger minstrels, the multicoloured rags of Italian peasants, or the fashionable absurdities which belonged to the Incroyables? Sir ISAAC NEWTON, as became a lover of truth, could not understand how anybody was able to find stone dolls interesting. If the obnoxious statuary had been covered with a few layers of bright paint he would have enjoyed it. A coloured apple enabled him to reveal something about gravitation; if Austrian pottery was to be seen in his friends' houses, who could count the number of truths with which he would have enriched science?

That there is a demand for coloured sculpture is, if possible, more clearly shown by every modern exhibition in Paris. The rival societies that have encamped themselves on the Champs Elysées and the Champ de Mars, as well as the supernumeraries who have to contend apart, have of late permitted industrial artists to take a share in the exhibitions. As a rule, the new recruits are no more than producers of coloured figures. Work of the kind is non-academic, but it is useful in pleasing the visitors. A man may be a Dutchman or a German, says JEAN PAUL, but every woman is born a Parisian, and since the Parisian dames are at present bewitched by the statuettes which are chryselephantine (and it may be more dainty than was the Olympian ZEUS), need we wonder if all over the world figures more or less glaring are to be bought by all who are eager to resemble those fair aestheticians? The painters who so readily transform themselves into sculptors cannot be expected to be satisfied with a monochrome material, especially when they observe the success of the industrial artists. M. GÉRÔME, in his *Bellona*, exemplified the true character of the sculpture which painters, and especially those who are possessed of courage, are ambitious to produce. The world is glad to see, if not to purchase, a work of that class, for it wants to have as little monotony as it can, and it craves for a variety of colour not only in buildings, sculpture and painting, but in the roughest sketches of the daily illustrated papers.

It will be difficult to convince the world that in sculpture at least colour is not allowable. The representatives of all nations who saw GIBSON'S *Venus* in Hyde Park were supposed to have condemned the tinting of marble, and the Welsh sculptor felt that the universal verdict was not in his favour. Many things which were intolerable in 1851 are, however, now appreciated, and if the *Venus* were to appear in the contemplated international exhibition, there would probably be a reversal of judgment. The fact is, people have become so accustomed to the amendment and repeal of legislative edicts they are tolerant about deviations from established principles in aesthetics, for they are unable to believe that the laws of taste can be more unalterable than those which have regulated the conduct of good citizens for centuries.

It so happens that sculpture presents one of those cases which offer contentious principles for all who are of a militant disposition. The history of the art is as uncertain as the theory. Everybody, for instance, will admit that the majority of Greek works which have come down to us are of marble that is nearly white. The advocates of polychromy, however, maintain that in many cases there were

remains of colour on the figures when they were found, which were removed in order to comply with the prepossession of connoisseurs in favour of unstained marble. In the early part of the century QUATREMÈRE DE QUINCY declared that he could still discern traces of red on the fleshy parts of Greek statues in Versailles and the Louvre, but the colour was daily becoming fainter. The recent revelations about the manipulation of the Cyprus figures, which are now in New York, are evidence of the bold but irreverential processes for adapting antiques to modern desires which still prevail among discoverers and experts. The conservators of the Louvre did not hesitate about cutting off the pedestal of the *Venus of Melos*, because on it was engraved the sculptor's name, and they wished to make their countrymen happy and the rest of Europe envious by presenting it as a work of PRAXITELES. In consequence we can no longer be certain whether the figure was originally perpendicular or at what angle it was inclined. The left arm and hand were also removed out of regard for symmetry. The head of the *Laocoon* has been interpreted by LESSING as a creation of inspired compassion that could unite pain with beauty. Tear open the mouth, says the critic, and the face becomes unsightly and abominable, forcing us to turn away our faces from it. There seems to be reason to suppose that the sublime head was created for the group after it was found, and the original head, which was afterwards exhumed, suggested that the priest of APOLLO was indifferent to theory, and instead of decorous sighing howled aloud. Compared with those instances of adaptation, the removal of patches of old stains would be a slight misdemeanour. It would therefore be unsafe to allege, from the present appearance of the sculpture, that polychromy was an unknown process among the Greeks.

The historical evidence is no less dubious. A straightforward account of the colouring of sculpture has not survived. The rare allusions to the practice are more or less indefinite, or are supposed to refer to exceptional works. PAUSANIAS, who was the forerunner of the MURRAYS, BURCKHARDTS and BAEDEKERS of the nineteenth century, is silent on the subject. Yet it might be supposed that if colouring were a general practice, some at least of the figures that were so treated would be worth a remark. There is an often quoted passage from PLATO'S "Republic," in which SOCRATES is made to say, "Just as if some one who should find us repainting statues should censure us because we did not put the most beautiful colours upon the most beautiful parts of the figure; for the eyes, which are the most beautiful, should be coloured not with purple but with black." Some scholars have assumed that the words relate to pictures. That may arise from prejudice. WINCKELMANN admits that PLATO was thinking of sculpture. The passage evidently relates to partial painting, and beneath a Greek sky there may have been an advantage in emphasising eyes which under most circumstances would be almost expressionless, or it may be too staring in effect. Taken literally, the passage does not affirm or deny anything about the painting of the whole figure. There is also the old story preserved by PLINY, who relates how PRAXITELES, when asked which of his works he most admired, answered, "Those which NICIAS has had under his hands." It is concluded by the upholders of polychromy that PRAXITELES' works were operated on by painters, and he preferred those which were coloured by NICIAS. The interpretation offered by WINCKELMANN is that NICIAS went over the clay models and imparted to them a little of that flexibility of contour which is seen in pictures. In support of the theory it can be said that some of the works ascribed to PRAXITELES are not marked by severity; they have a softness and grace that are more characteristic of a later period. On the other hand, Q. DE QUINCY supposes that PLINY spoke about encaustic painting which was applied generally, and that view is usually accepted of late years. It becomes the strongest evidence that can be furnished by the researches of scholars in support of polychromy.

Where there is so much difference, the safest conclusion to draw is that the Greeks did not restrict themselves to one mode of finishing their sculpture. From a remote time they were familiar with figures that were covered with vermilion, and which were accepted as not unsuitable representations of supernatural beings. In that way the staining or painting

of a figure with a sort of flesh-colour would not appear to them as unwarranted. Besides, we must remember that real robes, armour and jewellery were sometimes placed around statues. As the contrast between the white marble and the additions would be too marked and harsh to please the fastidious Greeks, colour was likely to be used to bring all parts into unity.

The arguments of those who maintain that every statue was coloured can be met by the existence of numerous examples of sculpture in which effect was gained by an accentuation of the rigidity of the marble. There are, for example, details in the *Apollo Belvedere* which have compelled sculptors to believe that it was copied from a work in bronze. The head of one of the horses from the pediment of the Parthenon, which has been described as a petrification of the creature formed by the hand of the god, is an example of the way in which the limitation offered by material is turned to account. The hardness and decision of the bony forms, as distinguished from the elasticity of the tendon and the softness of flesh of the horses in the Panathenaic procession, which amazed FLAXMAN, also exemplify treatment which would not be enhanced by any colour. The lithe figures of several of the athletes in the museums of Europe seem also adapted for being rendered in marble alone. On the contrary, with many of the figures of goddesses the application of colour need not be a wasteful excess of labour. The figurines discovered at Tanagra and elsewhere would not gain in effect if the colouring were removed, and if the Greeks succeeded with things on a miniature scale, we may be satisfied that they would not offend against the proprieties when dealing with works which were to sustain the criticism of the citizens.

There is hardly a theory concerning works of art which is not established on an unstable foundation. It is, therefore, absurd to dogmatise about colour being indispensable or unnecessary. The Germans, who have given more time than their neighbours to speculations on the subject of colour, are undecided, but probably there is a majority in favour of tinted figures. That polychromy has gained a footing is a sort of victory for it. Four centuries ago, or longer, Mediæval practice was ignored, and since that time Europe has been more loyal to the principle of keeping colour apart from sculpture than to most others. It is astonishing how much has been evolved in favour of whiteness, for bronze is accepted as no more than a substitute for marble, which can have few independent qualities. According to FLAXMAN, "the very reasons which prove that colours in sculpture may have the effect of supernatural vision, fits, or death, prove at the same time that such practice is utterly improper for a general representation of the human figure; because as the tints of carnation in nature are consequences of circulation, wherever the colour of flesh is seen without motion it resembles only death or suspension of the vital powers." Yet in the next paragraph of his lecture FLAXMAN admits the power of colour, when he tells us that the motive of the Greeks in applying it to their sculpture "was the desire of rendering these stupendous forms living and intelligent to the astonished gaze of the votary, and to confound the sceptical by a flash of conviction that something of divinity resided in the statues themselves." His words alone are enough to suggest how difficult it is for an artist who is not swayed by prejudice or convention to come to a conclusion on the subject. The arguments for and against the application of colour seem to have equal weight. FALCONET, the French sculptor, who was academical in his aspirations, would not attempt any combination of coloured materials in his own works, nor would he apply colour to marble. But he could not deny that very able men among his contemporaries differed from him. There is no doubt, he said, that materials of divers colours, if employed with intelligence, can be made to produce picturesque effects. The kind of intelligence which FALCONET assumed is rare among artists, for the failures in coloured sculpture are not as numerous as the successes. The best modern efforts are on a miniature scale, and are more allied to the chryselephantine works of the ancients than to those which were formed with white marble heads and extremities, while black was used for the draperies. Whether experiments on a more imposing scale would be as successful remains to be seen. But it may be assumed that people who can

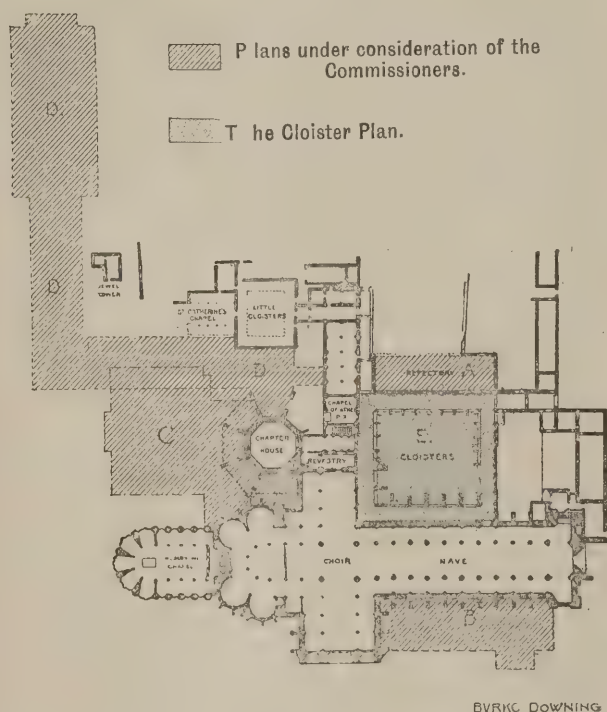
admire the crude colours of the Austrian potters are never likely to appreciate the delicate colouring which would be necessary if sculpture is to remain as one of the fine arts.

THE PROPOSED ADDITION TO WESTMINSTER ABBEY.

By H. P. BURKE-DOWNING.

HAD the question of cost been the only one in the way, it is probable that Mr. YATES THOMPSON's generous offer, which has now been made public, might have removed the grand obstacle to a final settlement of this matter. But this is not the case. The equally important question of where the new building (if new building there must be) is to be situated has yet to be decided.

Many schemes were considered by the Royal Commission before they issued their final report in 1891, and although they rejected all but two, they were evenly divided as to which of the two should be recommended. One of these two schemes proposed the erection of a monumental chapel on a portion of the area now occupied by certain houses in Old Palace Yard, to be connected with the Abbey



- A—Mr. Pearson's Chapel on the Refectory Site.
- B—Mr. Pearson's Chapel on the North of the Nave.
- C—Position suggested by Mr. Somers Clarke and Mr. Pearson. Outline of Mr. Clarke's Plan.
- D—Mr. Seddon's Monumental Cloisters and Chapel.
- E—The Cloisters and Cloister Garth.

at Poets' Corner. The other plan contemplated the erection of a monumental chapel on a vacant piece of ground, the site of the old refectory, lying parallel to the nave of the Abbey and adjoining the south wall of the great cloister. In one thing the Commission was unanimous, and it is good to see from Mr. SHAW-LEFEVRE's letter that the Government propose to lay a scheme before Parliament shortly for carrying out its recommendations on this point, viz. the clearing away the houses in Old Palace Yard that are a standing source of danger to the Abbey by their liability to fire.

Mr. THOMPSON's offer appears to be confined to one (viz. Mr. PEARSON's) of several methods which were laid before the Commission of carrying out the first alternative suggestion, and consequently it is not likely that it will help us much further towards an immediate solution of the difficulties with which the matter is surrounded, for until something is done to determine between the alternative recommendations of the Royal Commission, the state of things is pretty much of a deadlock.

To be decided the question must be reopened, and on any reopening might not some of the rejected schemes again claim attention? One of the principal qualifications which all were agreed the place for future memorials must possess, if it could not be found actually within the Abbey buildings, was an intimate union or connection with the Abbey. This is only reasonable, and if, indeed, it is not conceded, there seems no peculiar reason why we should confine ourselves to a site for the new monumental chapel in the immediate neighbourhood of the Abbey at all. As to how far each competing scheme satisfies this particular condition opinions will certainly differ, but it may very reasonably be urged that the scheme for a chapel on the site of the old refectory better satisfies this condition than the other scheme recommended by the Commission, and to which Mr. THOMPSON'S offer is confined. The refectory site would be the closer of the two, approached more directly and by a path which already shares the sentiments with which the Abbey itself is regarded. The new north aisle, which was one of the rejected schemes, would stand in an even more intimate connection, but to this there would be grave objections on the ground of serious interference with the ancient fabric.

But why not come still closer and avoid all the difficulty that we should certainly feel in regarding a "new memorial chapel" as one with the ancient Abbey? One of the suggestions before the Commission for supplying the much wanted space was to utilise for the purpose the ancient cloisters. Strictly speaking, these may not be "within the Abbey" (though the east walk of the great cloisters is structurally under the Abbey roof, occupying, in fact, the place of the western aisle of the south transept), but who is conscious of any distinction in his feelings with regard to the cloisters and to the Abbey itself? This scheme for utilising the cloisters for memorials—and here it may be remarked that the present difficulty is rather to find memorial space than burying space, which is probably ample for some 100 years to come, as appeared from the Dean's evidence—was rejected by the Commission on the ground that they are used as approaches to Westminster School, the chapter-house, the Abbey and its surrounding residences; but surely, were they to be adapted for the purpose of memorials, their use for convenience of approach might easily be restricted without very seriously incommoding any one; and then the other ground on which they were deemed unsuitable by the Commissioners, viz. their want of available width for memorial purposes, would lose considerable force. Whether employed in restoring and glazing the cloisters, in order to adapt them for the reception of the memorials of England's worthies in continuation of the long roll preserved within the Abbey walls, or merely in restoring without any intention of making use of them for any but their present purposes, a considerable sum of money might well be laid out, and the more that is done to brighten and restore to its former beauty and dignity this most ancient and—from its familiar connection with the daily life of the Abbey community—most interesting part of the Abbey, the more probably would its suitability for the purpose now before us be made to appear.

One great advantage which the utilisation of the cloisters would have is that the chapter-house might then, and would then, be really opened up (by the removal of the Old Palace Yard houses). This is an advantage recognised by all, and equally claimed for nearly every scheme put forward for a building on the south-east side of the chapter-house; but surely it is idle to talk of opening up the chapter-house if the view is immediately to be closed out again, as by all these schemes it unavoidably would be—at any rate in a very great measure.

In his scheme for dealing with this site Mr. PEARSON takes the greatest pains to leave open as much as possible of the chapter-house; but even by that, as may be seen from the elevation and perspective view in outline which accompanies the plan laid by Mr. PEARSON before the Commission, the whole of the lower part of the building beneath the windows would be enclosed. This being so, though we might feel sure that Mr. PEARSON'S new building would be in every way worthy of its surroundings, it would exclude us from a full view of the chapter-house from its ground-line, by which means it is clear that that element of the beauty of the building which consists in the perfection of its proportions as a whole would be lost to us.

THE MONUMENTS OF ANCIENT EGYPT.

A MEETING of the Society for the Preservation of the Monuments of Ancient Egypt was held on Friday last in the rooms of the Society of Antiquaries. The main object of the meeting was to protest against the scheme for forming a lake or reservoir at Philæ, which would render necessary either the submersion or the removal of the group of ancient buildings at that spot. The Earl of Wharcliffe having resigned the office of president, the Earl of Carlisle was elected as his successor and General Donnelly was elected vice-president.

The report, which was printed in *The Architect* last week, having been adopted, Mr. E. J. Poynter, R.A., the secretary, read the following letter which had been received from the Foreign Office:—

Foreign Office: February 14.

Sir,—I am directed by the Earl of Rosebery to acknowledge the receipt of your letter of the 5th inst., requesting information regarding the commission to be appointed in Egypt to consider the question of the storage of the Nile water, and expressing the fear of the Society for the Preservation of Ancient Monuments in Egypt lest the Egyptian Government should be advised to adopt a scheme which will involve the submersion of the temples of Philæ. I am to inform you that no decision has yet been arrived at, but that a special technical commission, composed of an English, a French and an Italian engineer, will be appointed by the Egyptian Government in the course of this month to consider the various projects which have been submitted for storing the surplus waters of the Nile. I am to enclose for communication to the Society an extract from a despatch on the subject which was addressed in December last by the Egyptian Foreign Minister to the foreign representatives in Cairo.—I am, sir, your most obedient, humble servant,

T. H. SANDERSON.

E. J. Poynter, Esq, R.A.

The Secretary also read a letter from Sir Frederick Leighton protesting against the vandalism of the scheme, and his hearty sympathy with the endeavours of the Society. The following resolution of the executive committee passed at a meeting on February 22, 1894, was put to the meeting:—

"That the Society for the Preservation of the Monuments of Ancient Egypt have heard with dismay that the project of making a dam above Assouan to form a reservoir of the Nile water, which will entail the submersion of the island and temples of Philæ during many months in every year, is about to be considered as one of the schemes which may be recommended for adoption by the technical commission recently appointed in Cairo to consider the question. The destruction of this group of buildings, unique for its beauty and of the highest historical interest, is an event which would be viewed as a disaster by the whole civilised world; and the proposed taking down and reconstruction of the temples on another island will in no way meet the objections to the scheme. The Society therefore begs to submit to the Secretary of State for Foreign Affairs that immediate steps should be taken to press for the withdrawal of the project from the consideration of the technical commission, and thus prevent this country from being in any way responsible for what would certainly be considered an act of vandalism."

A like resolution had on the same day been passed by the Society of Antiquaries. An extract was also read from Mr. Willcocks's report on "Perennial Irrigation and Flood Protection for Egypt," containing a note by Mr. W. E. Garstin, Under-Secretary for Public Works.

The President said that if the scheme were absolutely necessary for the good of the people of Egypt no considerations of sentiment should be allowed to stand in its way. But it would be impossible to preserve the character of the remains if they were removed, as much depended on the site. It would not be parallel with the case of the Elgin Marbles or the obelisks referred to. It would be more like an attempt to remove the Parthenon.

Sir Colin Scott-Moncrieff felt it his duty to speak on behalf of his successor, Mr. Garstin. The extract from his report was reasonable from beginning to end. Mr. Garstin's duty as an engineer was to find out the best plan for a reservoir in the interests of irrigation. He was not an antiquary or an Egyptologist, and admitted that the destruction of the temples would be an act of vandalism. But Mr. Garstin left the antiquarian question to M. de Morgan. Mr. Garstin was a man of eminent good sense, and the technical questions were left to a commission of engineers. There were not so many places for reservoirs as people thought. The matter would receive full justice and M. de Morgan would take care of the interests committed to him.

The President disclaimed any intention of criticising Mr. Garstin.

Colonel Plunkett, R.E., said that inaccurate reference was often made to the temple of Philæ. There were, in fact, not one temple, but a group of buildings some 400 yards long by 200 wide. Some of these were far older than what was called

"Pharaoh's Bed." He hoped the Egyptian sub-inspectors would do their duty. His experience was that native officials sometimes did damage to the remains of which they had charge.

It was announced that the cost of removing the temples would be about 200,000*l*.

THE LEIGHTON LIBRARY, DUNBLANE.

IT is recorded that Archbishop Leighton, who, according to Burnet, was "possessed with the highest and noblest sense of divine things," and who was "the freest from superstition, of censuring others or of imposing his own methods on them possible," left his library to Dunblane, where he once officiated as bishop. His successor, who had charge of the legacy, "supposed a room might be built out of some of the stones of the ruinous walls that are without the church, or of the bishop's ruined house, and desired that the room might be built of convenient largeness and good light, and handsomely furnished with presses and shelves and some desks for reading, and chaires or stools at them to sitt on."

The house was duly built, and seems to have cost 16*l*. 2*s*. 6*d*. sterling, and 200*l*. was assigned "to be stock for a sallery to a keeper." "Mr. Johne Liteljohn, student of divinity, the sone of a deceast minister within the diocess," was appointed first librarian. The building is a plain structure, consisting of a single room, built on arches, near the newly-restored cathedral. The inscription on a monumental stone let into the rough-cast wall has been defaced, but the mitre remains above and a skull beneath. This "alone of inhabited ecclesiastical edifices in Scotland," according to the late Dean Stanley ("Lectures on the History of the Church of Scotland," p. 113), "retains a mitre." Mounting some stone steps from outside, the visitor finds himself in a room about 35 feet long and 15 feet broad, with a modern whitewashed ceiling. Sixteen cases are ranged against the walls, with one long low case down the middle. They are constructed of old oak, pieced out with painted deal, and are in a very shaky condition. There are about a dozen good old oak chairs remaining in the room. On the walls are three engravings of the bishop, one marked "Ætat 40, 1654," and on the back "Jacobus Dixon dono dedit 26 Oct. 1779." One notes the large eyes, with their pensive look, the firm chin, the face clean shaven all but the upper lip, the mass of dark hair parted in the middle above the ample forehead. He is habited in gown and bands, like most divines of the period. An Indian ink enlargement of the engraving, now fallen to the floor, bears the inscription, "To the right honourable and reverend the trustees of the library of Dunblane, this drawing of Archbishop Leighton, its venerable founder, presented by John Robertson." There are also on the walls an engraving of Robert Drummond, Bishop of Sarum, afterwards Archbishop of York, 1761; a print of Dr. Finlayson, Professor of Logic in the University of Edinburgh, and a chart of British history.

The only librarian of any reputation seems to have been Mr. William Coldstream, who had a long spell of office in the last century. A tablet with an inscription in Latin to his memory has been placed in the cathedral. There is a desk in the library full of his papers. Among them the following letter:—"Dr.—If you have no appointment this night, I shall be glad to meet you and do what we designed last night. I debar Mercury and invite Bacchus for one hour.—I am, Dr. Sir, yr. most humble servt., Tho. Duthie. Dunblane, 12th Aprile, betwixt 5 and 6, —" (year obliterated).

There appear to have been originally between thirteen and fourteen hundred volumes, of which a considerable number have been lost. Many of these are enriched with marginal notes by Leighton's own hand.

ART OF GLASS-STAINING.

AT the meeting of the Philosophical Society of Glasgow in the Society's rooms, Bath Street, Professor Ferguson presiding, Mr. Stephen Adam read a paper on "The Art of Glass-Staining—Mediæval and Modern Methods." Within recent years, he remarked, such a marked advance had been made in and about Glasgow in the manufacture of the raw material, glass, as almost to revolutionise the character of the profession of glass-stainer, placing it, by the artistic excellence of materials at hand, on a wider and broader basis, and bringing it within reach of all who loved harmonious surroundings. There were possibilities in Glasgow never attempted yet. They had now at their disposal beautiful materials, richer in every way than the thin and textureless glass used even twelve years ago. The object of his paper was to show that to make more of any material such as glass, metal, marble or wood than what the pure material was capable of expressing in itself was to destroy the truth in it, and truth was the very germ and essence of art. Stained glasswork in the tenth century, he

stated, was produced by the monks, who used a hot iron for shaping out the glass, and used the hairs from the mane of an ass for tracing the details. Legitimate modern methods were pretty much the same. The materials now at hand rendered it possible for the present-day craftsman to produce glass equal in quality to that produced by the monks in the tenth century. He traced the history of the art to its decay in the seventeenth century, and to the introduction of German glass in the early part of the present century. The almost phenomenal progress of decorative art in Glasgow of late must satisfy the most fastidious in art matters that the craft in Glasgow possessed the ability and strength to do their own work. With the tuition the younger people were getting, the coming decade would surpass by leaps and bounds the wonderful advance of the past. Love of art was taking a firm hold, and nothing would more effectually sweeten the lives of hard-working men and women. He quite recognised the broad, cosmopolitan nature of art, and would not narrow it down to purely local circles and cliques, but at the same time encouragement must be given to art-workers and work in their midst. The Glasgow masses had to be educated up to appreciate, even to understand, say the new art galleries and all that doubtless would be beautiful and instructive in them, otherwise money and labour alike would be wasted. Let Glasgow flourish in art as in commerce, and flourish it would if the city magnates, the custodians of the city's honour in art, did their duty; flourish it would if the wealthy and influential among the citizens stopped running to London and continental cities for fabrics which, after all, they only brought back whence they had originally gone and at a doubled price. There were opportunities in the municipal buildings for intelligent decoration of its interior, and in which he hoped every city decorative product would play a part. Mere dazzle and attractiveness of marble slabs and glitter of gold leaf were not the highest form of decoration. Though it might appal and bewilder country cousins, it did not satisfy the intellectual man of art. There was nothing educative in mere dead material excepting for the geologist. Marble could be made to speak and tell wondrous stories; so could frescoes, painted decoration and stained-glass—stories informing those yet unborn of their city's history, the lives of its eminent men and women, and its industries, shipping and commerce.

Mr. John Mayer, the secretary, contributed a short supplementary paper on "The Manufacture of Cathedral, Muranese, Venetian and Rippled Plate-Glass in Glasgow."

ASYLUMS FOR THE INSANE.

THE first visit of the present session of the Edinburgh Architectural Association took place on Saturday afternoon to Craighouse Asylum. Dr. Clouston and Mr. Sydney Mitchell were the leaders of the party, the former dealing with the buildings in their medical aspect, the latter describing their main architectural features. Dr. Clouston explained that in old times the idea of an asylum for the insane was a prison. The whole notion was detention, and all architectural considerations were subservient to that of keeping in the patients safely. During the last fifty years, however, a great change had taken place in the ideas of asylum architecture. It had been altogether revolutionised. Medical experience had proved that a great number of the insane did not require these extreme restrictions; in fact, it was discovered that more than half the insane did not need them at all. It was also discovered that a man who was "off his head" was not necessarily altogether "off his head," and that if he were kindly and humanely treated, put into a room that was bright, pleasant and agreeable he was humanised, and the mental symptoms for which he was sent to the institution were enormously modified. It was found that a man's surroundings and conditions of life immensely influenced his state of mind. Therefore, the principle was got hold of to make the institution the right hand of the doctor, and that principle had been carried out. In order, however, to carry it out they had to keep in mind the enormous variety of the forms of mental disease. The common idea of insanity was that all insane folks were very much alike, but that was contrary to fact. Mental disease might exist in every possible form from the slightest departure from the normal condition to raving delirium. Medical study showed that it was better to have such a variety of architecture that almost each variety of mental disease should have something suitable to itself. The house required to be adapted to its inhabitants, and that principle had been carried out pretty well of late years. An asylum, therefore, should contain all the characteristics of an hospital in some of its parts, and of a home in others, and both aspects required to be mixed up together. They required further to make provision for the changes that a patient might pass through as his condition improved. It had an immensely healing influence to remove a patient from association with all that reminded him of the worst stage of his disease. In fact, all restrictions came to be abolished except those which were absolutely necessary. When the authorities of the Royal

Asylum came to consider what they ought to do in constructing their new buildings they found there was absolutely no standard they could adopt, for ideas were changing almost year by year. He had visited all the best institutions in Europe, Asia and America, and they had really devised in their own way the standard of what they were to do. They felt a sense of responsibility in regard to Edinburgh—a city of such magnificent architecture—and at the same time they were not going to allow their architect to sacrifice any of the medical considerations. They naturally wanted, for the sake of Edinburgh, for the sake of themselves, and above all for the sake of the insane, to make it the most efficient and the best institution, not in Edinburgh, not in England, but in the world. It was decided to provide for half the patients distinct houses like ordinary dwellings, and to have a large centre for administration, for amusement, for food, for physic, and this scheme had been carried into effect. The centre of the establishment was a great hall like the hall of an English Tudor mansion, where everybody met together, into which every part of the house opened. There were, he explained, different classes of wards, so that a patient progressing towards recovery might be removed from one to another, where he had not the associations of his delirium and the mental impression he got in the first. The kind of impression they wished to produce, he said, was one of cheerfulness, of fresh air, of bright colour and attractiveness. They wanted, indeed, to make the place so nice that every citizen of Edinburgh ought to think it a privilege to be there. Mr. Sydney Mitchell then conducted the party over the buildings and described them.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE fifth lecture of the session was delivered by Mr. George Walton, the subject being "Interior Decoration." By way of introduction the lecturer alluded to the different classes of decoration in use at present, which require, on the part of the decorator, considerable knowledge and experience to apply rightly in practice. The materials were described, with their capabilities for producing effective work. It was urged by the lecturer that simplicity and not elaboration should govern the work, and ornament, if used at all, should be used sparingly, and should be very fine and well adapted for its position. Pictures have their decorative value, and this has perhaps been overlooked by the artists of to-day, who, in the opinion of the lecturer, might act a little more in unison with the architect in creating work for permanent positions. In the decoration of an ordinary commonplace house the aim should be to get rid of the ugly portions, having them replaced by suitable decorations of an artistic value. The treatment of ceilings, walls and floors was dealt with at length by the lecturer, who described various methods of producing good results by the harmonious employment of the materials.

TESSERÆ.

Ancient Japanese Houses.

THE allusions to house structure in the *Kojiki*, though brief are suggestive, and carry us back without question to the condition of the Japanese house in the seventh and eighth centuries. Mr. Satow, in his translation of the Rituals, says that the period when this service was first instituted was certainly before the tenth century, and probably earlier. From these records he ascertains that the palace of the Japanese sovereign was a wooden hut, with its pillars planted in the ground, instead of being erected on broad flat stones, as in modern buildings. The whole framework, consisting of posts, beams, rafters, door-posts and window-frames, was tied together with cords made by twisting the long fibrous stems of climbing plants, such as *Pueraria thunbergiana* (*kuzu*) and *Wistaria sinensis* (*fuji*). The floor must have been low down, so that the occupants of the building, as they lay or squatted on their mats, were exposed to the stealthy attacks of venomous snakes, which were probably far more numerous in the earliest ages when the country was for the most part uncultivated than at the present day. There seems some reason to think that the *yuka*, here translated "floor," was originally nothing but a couch which ran around the sides of the hut, the rest of the space being simply a mud floor, and that the size of the couch was gradually increased until it occupied the whole interior. The rafters projected upward beyond the ridge-pole, crossing each other as is seen in the roofs of modern Shan-tau temples, whether their architecture be in conformity with early traditions (in which case all the rafters are so crossed) or modified in accordance with more advanced principles of construction, and the crossed rafters retained only as ornaments at the two ends of the ridge. The roof was thatched, and perhaps had a gable at each end, with a hole to allow the smoke of the wood fire to escape; so that it was possible for birds flying in and perching on the

beams overhead to defile the food or the fire with which it was cooked. From the *Kojiki* we learn that even in those early days the house was sufficiently differentiated to present forms referred to as temples or palaces, houses of the people, store-houses and rude huts. That the temples or palaces were more than rude huts is shown by references to the verandah, the great roof, stout pillars and high cross-beams. They were at least two storeys high, as we read of people gazing from an upper storey. The peasants were not allowed to build a house with a raised roof-frame—that is, a roof the upper portion or ridge of which was raised above the roof proper, and having a different structure. This indicates the existence at that time of different kinds of roofs or ridges. Fireplaces were in the middle of the floor, and the smoke outlet was in the gable end of the roof protected by a lattice, as seen in the Japanese country houses of to-day. The posts or pillars of the house were buried deep in the ground, and not as in the present house, resting on a stone foundation.

The Builder of the Alhambra.

On the walls of the Hall of the Two Sisters in the Alhambra, over the mosaic dado, are the following verses, forming a poem in honour of its builder, the Imán Ibn Nasr:—"I am the garden, and every morn do I appear decked out in beauty. Look attentively at my elegance, thou wilt reap the benefit of a commentary on decoration. For, by Allah! the elegant buildings by which I am surrounded certainly surpass all other buildings in the propitious omen attending their foundation. How many delightful prospects I enfold! How many objects, in the contemplation of which a highly-gifted mind finds the gratification of its utmost wishes! Here is the wonderful cupola, at sight of whose beautiful proportions all other cupolas vanish and disappear. To which the constellation of the Twins extends the hand of salutation, and to converse with which the full moon deserts her station in heaven. Nay, were they both to abide here in its two aisles, they would hasten to pay it such homage as would satisfy all the neighbours around. No wonder then if the stars grow pale in their high stations, and if a limit be put to the duration of their light. Here also is the portico unfolding every beauty. Indeed, had this palace no other ornament, it would surpass in splendour the high regions of the sky. For how many are the gorgeous robes in which thou, O Sultan, hast attired it, which surpass, in brilliancy of colour, the vaunted robes of Yemen! To look at them, one would imagine them to be so many planets revolving on the arches of this court as on their orbits, in order to throw in the shade even the first rays of morning. Here are columns ornamented with perfection, and the beauty of which has become proverbial; columns which, when struck by the rays of the rising sun, one might fancy, notwithstanding their colossal dimensions, to be so many blocks of pearl. Indeed, we never saw a palace more lofty than this in its exterior, or more brilliantly decorated in its interior; or having more extensive apartments—markets they are, where those provided with money are paid in beauty, and where the judge of elegance is perpetually sitting to pronounce sentence. Which, when the breath of the zephyr expires before the noon-tide rays, appear surrounded by a light which throws into shade all other light. Between me and victory the closest relationship exists; but the most striking resemblance between us two is the splendour we both bear."

Greco-Roman Wall-Paintings.

When the particular style of decoration which is familiar to us from the wall-paintings of Pompeii first came into vogue it is difficult to say. From the tomb of Volsci, in which the figures are arranged as in a bas-relief and form the chief feature of the decorative scheme to the Pompeian paintings—where they are quite subordinate to a more or less extravagant but always elegant architectural framework—there is a gap, which the discovery of the house in the gardens of the Farnesina, at Rome, supposed to be of the Republican period, does not entirely fill, for the system in this, though more sober and consistent and less fantastic, is already the same as at Pompeii. In this beautiful house and in the house of Livia, or Germanicus, as it is variously called, we have, with some exceptions, the finest specimens of antique decoration that exist. The former especially is evidently painted by the best artists of the time, and various painters have been employed on the figure-subjects in the panels. There are no paintings so good from Pompeii except from one house, and these remain only in small fragments arranged on a wall in one of the corridors of the Museo Borbonico, as nearly according to their original disposition as their imperfect state permitted. These fragments, however, display an art of design and a skill of execution which fully justifies the most extravagant estimate which is recorded of Greek artists. In certain qualities of execution they are unrivalled by the best work of any of the great schools of the sixteenth and seventeenth centuries. Freedom of hand and certainty of touch are the first requisites of decorative painting in no matter what style, but they are combined here with a rich

quality of impasto laid on with a full brush (but with supreme delicacy) in gradations which, though as clean as mosaic in the precision, are as full and round in modelling as though done by Velasquez; or a better comparison may be found, as we are treating of ornamental and foliated forms, in the fine but broadly-treated details of the wreaths of ivy and vine which adorn the figures in a Bacchanalian picture by Nicholas Poussin, exhibited a few years ago in one of the Royal Academy Winter exhibitions. The same, indeed, may be seen, though more obscured by time and varnish, in the two magnificent pictures of similar subjects by the same master in the National Gallery; they will at least convey an idea of the special quality of painting referred to. Imagine the whole decorations of a room carried out with the artistic perfection of these details, and with all the beauty of surface which the elaborately-prepared stucco grounds of the ancients provided for their artists, and one can realise a specimen of decorative art such as none but Greek artists have ever produced, and such as in our hurried world is not likely to be produced again.

Early English Gothic.

The general appearance of the Early Gothic styles, whether English, French or German—the glorious buildings of the thirteenth century—is truly magnificent, and this is generally known and acknowledged to be the finest period of the building art that the world has ever seen. The marvellous skill of the construction of the vaults, and the piers and buttresses to carry them, has long been admired as quite wonderful. A mere skeleton is built, and the wall between the buttresses may be as thin as possible, and even may be entirely of glass, as was discovered afterwards in the large windows of the Decorated and Perpendicular styles. Although there are local characteristics in each country and each district, the general style of the thirteenth century is the same all over the north and west of Europe. One place may be a generation in advance of another in the introduction of the new style, but it spread very rapidly in England and France; in Germany the fine Romanesque style of the Rhine churches lingered for half a century, but in general the progress was nearly simultaneous. That St. Hugh's choir at Lincoln is the earliest pure Gothic building in the world may be said to be now a matter of demonstration; the course of St. Hugh has been traced from his birth to his death, and all the buildings with which he was connected have been examined, and it is now clear that he was not an architect, and did not bring either architect or masons with him from Grenoble, which was, on the contrary, very much behind England at that period. The name of the architect is French, but his family came over to England with William the Conqueror, and settled in Lincolnshire, where it is still one of the county families, and there is little doubt that Geoffrey de Noyers (now called Dunoyer) was a Lincolnshire man, and that district was then in advance of any other either in England or France. Of the present building, the south aisle was built first, and in the eastern bay of that is the only vestige of Norman work in the whole building; the billet ornament occurs on the rib mouldings of the vault in that bay only; the side wall is the one where the outer wall was erected first and the inner wall built up against it, which can be distinctly traced as before mentioned.

Bernini as an Architect.

The greatest architectural genius of the seventeenth century was Bernini, whose name is generally associated in architectural history with that of his contemporary, Borromini, as a corrupter of the style. He was sculptor and architect, and designed several churches, palaces, fountains and other works at Rome, among which may be noticed the palaces Barberini and di Monte Citorio, the churches del Noviziato de' Gesuiti and Gandolfo, the college of the Propaganda, and the fountains of the Piazza Navona, the Piazzas Barberini and di Spagna, the colonnade of the Piazza di S. Pietro, and the great staircase between the church and the Vatican. Bernini has sometimes displayed the highest art in the arrangement of light and in overcoming difficulties of situation, and his effects are occasionally inimitable. His style presents more licenses than absolute errors or abuses, and his graces and elegances go far to atone for his many faults. The porticoes forming the Piazza di S. Pietro, though they were calculated to make the want of columnar beauty and relief in the church itself more painfully felt than before, are in themselves one of the finest creations of Italian architecture. Columns had never before in modern times been employed in such profusion, or to the production of so great an effect.

Silvester's Remedy against Dampness.

The process consists in using two washes or solutions for covering the surface of the walls—one composed of Castile soap and water and one of alum and water. The proportions are three-quarters of a pound of soap to one gallon of water and half a pound of alum to four gallons of water, both substances to be perfectly dissolved in water before being used. The walls should be perfectly clean and dry, and the temperature

of the air not above 50 degrees Fahr. when the compositions are applied. The first, or soap wash, should be laid on when boiling hot, with a flat brush, taking care to form a froth on the brickwork. This wash should remain twenty-four hours, so as to become dry and hard before the second or alum wash is applied, which should be done in the same manner as the first. The temperature of this wash, when applied, may be 60 or 70 degrees Fahr., and this also should remain twenty-four hours before a second coat of the soap wash is put on. These coats are to be applied alternately until the walls are made impervious to water. The alum and soap thus combined form an insoluble compound, filling the pores of the masonry and entirely preventing the water from entering the wall.

French Wall-Papers.

The narrow width of the French pieces (18½ inches) makes the blocks more handy to handle, and they are kept a more uniform length than the English ones, which must be an advantage to the printers in the long run. It enables them to work down the side with facility, a method of pitching which is said to insure greater straightness in printing than working across the piece, while the extra width of the English blocks (21 inches) and the variations in the length of them, arising chiefly from the practice of using half and three-quarter blocks, make it almost imperative for English workmen to work across the piece. The use of blocks of extra lengths and widths up to 28½ inches wide, such as are often used here for large patterns, is a distinct disadvantage to a printer working on piecework, throwing his hand out for blocks of the ordinary size, and decreasing his power of production for a short time after each change. The French pieces, too, are only 9 yards long, which is an advantage in manufacture over the English 12 yards in some respects. It enables them to colour the whole piece on one long table without stopping, and to handle them generally more quickly and easily.

The Orton Waterville Pulpit.

In 1618 a pulpit was erected in Great St. Mary's Church, Cambridge, which is now in the church at Orton Waterville, near Peterborough—at least there seems every reason for believing this to be the St. Mary's pulpit, although it is only fair to state that there are other claimants for that honour. The parish books of Orton show the following expenses for the years 1748 and 1749:—"Paide to Dr. Long for the pulpet and desk, 3*l*. 3*s*.; Sam. Sharman, charges for going to Cambridge for the pulpet, and tolls, 9*s*. 5*d*.; Thomas Smart, for work done at the pulpet and bells, 8*s*. 11*d*." In these years Dr. Long was rector of the parish; he was also Master of Pembroke College, to whom the living belongs, from 1733 to 1770, so that it is probable enough that he would have opportunities of securing the old pulpit when the new one was placed in St. Mary's. The pulpit now at Orton is one of the most splendid specimens of Renaissance carving to be seen. It is octagonal, of great size and height, and stood originally on a pillar, which, however, has now been divided in half, and the lower portion perished. Each side is deeply recessed in a richly moulded arch, and at each angle is a small shaft, supporting a figure of the Alma Nutrix, which acts as a caryatid to support the upper ledge. It is in excellent preservation, and of course, being in a church which is plain almost to meanness, is the chief object of attraction there, and is famous in the neighbourhood.

Influence of Colour.

Considered intrinsically, the physically stimulating effects of colours fits them for a high office. The varieties of forms, aided by all the relief which light and shade can give, would be insufficient to enable us to discern objects clearly without the aid of colour. It appears that, throughout nature, colour serves this purpose only; and, if so, it may be said to approach the abstract idea of distinctness: there cannot be a better ground for considering it the chief auxiliary of beauty. As a source of distinctness, this adjunct gives importance to objects in nature as it does in art; yet, in examining the result, we should consider not merely its distribution among objects, but its relation to human vision—for the question is, how far our attention is attracted by it? In many cases, for example in the brilliancy of glowing skies and the splendour of light, the force of the impression does agree with the excellence of the objects and their associations. But innumerable instances might be adduced from the animate and inanimate world, where the emphasis of colour is lavished on things to us comparatively indifferent. On this point it is to be remarked that the vivacity of tints in flowers, birds and insects, for example, is generally unobtrusive, either from the minuteness of the objects, their short duration, or their rapid movement; and that in climates where such hues occur on a larger scale they are more sustained throughout nature, so that the eye is not startled by them; they are, under such circumstances, far less conspicuous than when they are transported to a more monotonous region.

NOTES AND COMMENTS.

THE society of artists known as the XX. having come to the end of their exhibitions in Brussels, a successor has been created having the title of La Libre Esthétique. The aims of the two are identical, viz. the promotion of novelty in art. The new series of exhibitions will not be confined to paintings, drawings and etchings. Applied art is also to be represented by examples of the creations of goldsmiths and other metal-workers, tapestry-weavers, bookbinders, clockmakers, &c. Several French artists have contributed to the exhibition, which occupies only a small part of the Musée Moderne, and this country is represented by Mr. CAMERON and Mr. FRAMPTON.

ONE of the strangest freaks of this season's gales is reported from Buda-Pesth. The Count EDMUND ZICHY brought a portrait of his late father, by HANS MAKART, to that city in order that a copy of it might be made by Herr KARDOS. He sent it by a servant to the painter's studio. The man took a seat beside the driver on an omnibus. As they were passing over the suspension bridge a gale of wind carried off the picture, and it fell into the Danube. Strange to say, the portrait did not again rise, and a work of art that was valued at 1,500*l.* has consequently disappeared.

NUMEROUS as are the books of engineering memoranda and tables, there is room for the new-comer which Messrs. CROSBY LOCKWOOD & SON have published. It bears the title of "The Engineer's Year Book," and is edited by Mr. H. R. KEMPE. Being of larger size than "Molesworth," it can contain the sort of information which is given in "Trautwine's" and other American pocket-books, and which used to be found in "Weale's" and "Alcock's." In other words, it supplies explanations and directions as well as formulæ. The "Year Book" contains about 600 closely-printed pages, and is arranged to answer the demands of mechanical as well as civil engineers. As far as we have examined the contents the information appears to be accurate, and it is derived from many authorities. Mr. KEMPE has performed his editing carefully, and the "Year Book" deserves to become one of the most successful of the technical annuals.

THERE is no publisher who has shown better taste in the "getting-up" of his books than Mr. ELLIOT STOCK. The prices are moderate, and the binding must therefore be in "cloth," but every volume has something pleasing about its appearance which entitles it to a place among costlier books. The Elizabethan Library is one of the publisher's most interesting series, and as the last volume consists of "The Love Verse from the Minor Poems of Edmund Spenser," edited by the scholarly Mr. A. B. GROSART, it is needless to say the contents are delightful. Those who contrive to keep up to the death of the Beast in the "Faerie Queene" were once said to be very few and very wearied, but the love-poems can afford enjoyment in every line. Unlike the majority of their kind, they are sincere, for SPENSER was really attached to his wife, ELIZABETH BOYLE. The sonnets deserve to be compared with those ascribed to SHAKESPEARE, and the two collections will serve better than TITIAN's picture to suggest the differences between sacred and profane love.

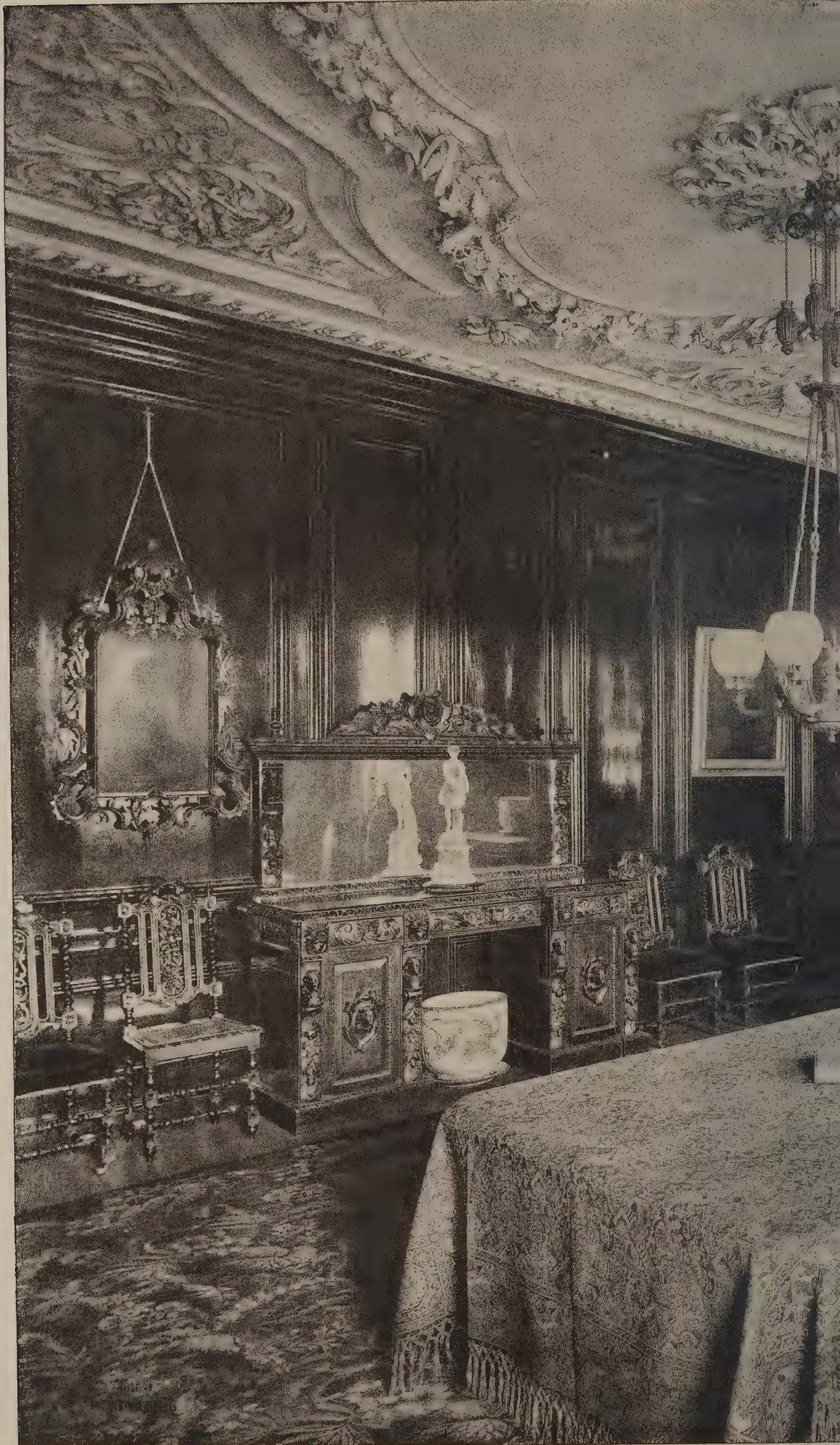
READERS of Mr. THOMAS HARDY's "A Laodicean" will remember how GEORGE SOMERSET, the young architect, first found his way to Stancy Castle by the aid of the humming of the telegraph wire which the heroine had set up. On that occasion "the wire sang overhead with dying falls and melodious rises that invited him to follow; while above the wire rode the stars in their courses, the low nocturn of the former seeming to be the voices of those stars 'still quiring to the young-eyed cherubim.'" Many novel readers of a realistic turn may have believed when they read the passage that Mr. HARDY was forgetting his principles of composition, which have an artistic rather than a scientific tendency, when he introduced a relationship between the music of the spheres and the vibratory sounds of a telegraph wire. But the lecture which Mr. W. H. PREECE has just delivered at the Society of Arts on "Electric Signalling without Wires" confirms the novelist's suggestion. In his remarkable conclusion he said:—"Strange, mys-

terious sounds are heard on all long telephone lines when the earth is used as a return, especially in the calm stillness of night. Earth currents are found in telegraph circuits, and the aurora borealis lights up our northern sky when the sun's photosphere is disturbed by spots. The sun's surface must, at such times, be violently disturbed by electrical storms, and if oscillations are set up and radiated through space, in sympathy with those required to affect telephones, it is not a wild dream to say that we may hear on this earth a thunderstorm in the sun. If any of the planets be populated with beings like ourselves, having the gift of language and the knowledge to adapt the great forces of nature to their wants, then if they could oscillate immense stores of electrical energy to and fro in telegraphic order, it would be possible for us to hold commune by telephone with the people of Mars."

A BILL to regulate buildings has been prepared for South Australia, but apparently it is not more perfect than was the first Building Act for London. The South Australian Institute of Architects have accordingly appointed a sub-committee to suggest amendments to it. During the discussion some of the members called attention to the fact that the Act did not regulate in any way the quality of mortar to be used in suburban houses, which was a matter of the first importance, for they might legally be built with "pug" without any lime. Several other amendments are needed if the Legislature desire to prevent jerry-building.

THE fourth volume of the "Sketch-book of the Glasgow Architectural Association" which has appeared is rather disappointing, for it is not easy to trace an improvement on the plates in the earlier volumes. Whether the defects are due to the drawing or the reproduction, or to both, we cannot decide, as we have not seen the originals. The most careful plates among the measured drawings are those from the crypt of Glasgow Cathedral, but in that case there happened to be some emulation among the members. There are a couple of plates of ALEXANDER THOMSON'S Neo-Grec churches, which are excellent subjects for geometrical drawings. If the contents of the volume were confined to his work much advantage would be derived by the draughtsmen. Among the freehand drawings one of St. Mary's, Oxford, is the most effective. The disadvantage of trusting to pencil lines is suggested by a plate from Heriot's Hospital, for whatever was definite has vanished, and little more than a few brush strokes remain. In such cases the want of experience is evident. Apparently a member is left to find out the best course to adopt for himself. If one of the editors of the London Association Sketch-book could be persuaded to give the Glasgow students the benefit of his experience, especially about drawings that turned out failures, a great improvement would be sure to follow in the succeeding volumes.

THE Cardiff Town Council are showing shrewdness in avoiding premature conclusions about the contemplated Municipal Buildings. At the last meeting there was a step forward, since the following resolution was unanimously adopted:—"That after full discussion of the requirements of the county borough for law courts, police arrangements and municipal purposes, it is resolved that the present buildings be reserved, with improvements for the assizes and all dependent departments, county court, quarter sessions and police business, and a separate structure be provided, on a site as near as possible to the present Town Hall, for all the necessities of the municipal work of Cardiff." The determination will, of course, put an end to all schemes for bringing legal, civic and administrative business under one roof. The question has yet to be settled where the eligible site for a Municipal Building near the present Town Hall is to be found. The Marquis of BUTE would allow one to be taken from the Cardiff Arms Park, but at the price of 25,000*l.* an acre, or say 50,000*l.* for an adequate site. At present the Council hesitate about paying so large a sum, and it is assumed that steps could be taken which would enable them to obtain the ground on more economical terms. But after all the Marquis of BUTE has done for Cardiff, it is not complimentary to him to suggest that he is asking more than its value for a piece of land.



PHOTOGRAPHED BY BEDFORD LEMERE & CO

rchy 2nd 1894.



INX PHOTO SPRADUE & CO. 4 & 6 EAST HARDING STREET FETTER LANE, E.C.

DEFORD, NORTH DEVON.







PHOTOGRAPHED BY BEDFORD, LEMERE & CO

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INX PHOTO SPRACUE X 11 4 1/2 EAST HARDING STREET FETTER LANE E.C.

OSTEAD: WEST END
ERELL, Architect

ILLUSTRATIONS.

PARISH CHURCH, HAMPSTEAD.—WEST END.

NEW CHANCEL, PARISH CHURCH, VERWOOD, DORSET.

THE new chancel of the church of St. Michael and All Angels has been built of stone from the designs and under the superintendence of the architects, Messrs. ADYE & ADYE, M.S.A., of Town Hall Chambers, Bradford-on-Avon, and the work has been carried out by Messrs. HAYWARD & WOOSTER, of Walcot Place, Bath. At the entrance of the chancel is a panelled alabaster screen and wrought-iron gates. The altar is approached by seven polished Devonshire marble steps, and the floor of the chancel is paved with glazed tiles from Messrs. MINTON, HOLLINS & Co. The roof is formed of oak timbers, moulded, the principals resting on carved corbels. The choir stalls are also of oak panelled to correspond with the chancel screen. The arches of the sedilia and piscina are supported on polished marble columns, and the label over is supported by carved figures of angels playing respectively the harp, the cymbals and the flute. On either side of the east window (terminating a string-course) are two angels in the attitude of adoration, holding the host and the chalice. The altar is of oak, with open panels and a marble top inlaid with the usual five crosses in brass. It is surmounted by three re-tables supporting the usual ornaments, and at the back is a dossal formed of a warm-coloured red damask, with wings of silk plush and side hangings of red and gold brocade.

BUSINESS PREMISES, UTTOXETER.

THE premises represented have been erected for Messrs. HENRY BAMFORD & SONS, in the Market Place, Uttoxeter. The work is executed in white Hollington stone, and has been very well carried out by Messrs. ISAAC WARD & SONS, of Uttoxeter. The carving is by Mr. GILBERT SEALE. The architect is Mr. W. T. WALKER, 5 West Street, Finsbury Circus, E.C.

ROOM IN ROYAL HOTEL, BIDEFORD, NORTH DEVON.

ILLUSTRATED JOURNALISM.*

ENGRAVING, and I use the term in its widest significance, and embracing therein all photographic reproductive processes whatsoever, may be roughly divided into two main divisions, into one of which every plate and block, from which an impression is taken upon paper, naturally falls. The first of these is "relief" engraving, so called from the fact that the lines, by means of which the picture is produced, project in relief from the block, whether that block be of wood, metal, or even of stone. In the second, which is termed for want of a clearly definitive English expression, "intaglio" engraving, the lines are, on the contrary, sunk below the surface of the plate. To obtain an impression from the relief block, all that is necessary is to prepare the latter by passing thereover a roller charged with printing ink. This adheres to the raised portions, which subsequently become the lines of the print, and leaves untouched the sunken surfaces which are to represent the white spaces. When, therefore, a sheet of paper is placed on the top of the block and pressure applied thereto, it is the raised places only which transfer their inky coating to the surface of the paper. The principle of printing from an intaglio plate is diametrically opposed to this. Here the entire surface of the plate is, first of all, covered with the ink, this is then carefully wiped away from the surface or open spaces and left remaining only in the sunken lines and depressions. When paper is forcibly impressed upon this plate it takes up the ink from these latter alone, the main surface of the plate leaving no record.

As a matter of fact, a print from an engraving or intaglio process consists of a species of cast, as it were, the paper being forced into the lines, impressions from which are therefore raised above the main surface of the paper in print. The reverse takes place in the case of a relief block, the lines of which are depressed below the surface of the paper.

Of relief printing, the most familiar example is the page of an ordinary book printed from type. Of intaglio printing, the most commonplace example is an ordinary visiting card.

I am particular, at the outset, to impress upon you these fundamental differences, as without a proper comprehension of the contra-distinctive nature of these divisions of what we somewhat loosely term engraving, the difficulties which have beset the path of the newspaper illustrator would not easily be comprehended.

A newspaper, as I need hardly say, is printed from type, and type is, in its essence, a form of relief engraving. It becomes absolutely necessary, therefore, that pictures which have to be printed side by side with type should be engraved by the relief, and not by the intaglio process. This is a conclusion the full bearing of which upon the subject does not appear, until it is pointed out that the most artistically satisfying reproductive methods are to be found in the ranks of the intaglio processes.

Of relief engraving, the parent undoubtedly is xylography, or wood engraving. In regard to its claims to considerable antiquity I need not detain you, beyond mentioning that its practical popular extension, to any considerable extent, depended upon the invention of paper, for upon paper alone could any considerable number of impressions be taken. It is true the East has for centuries furnished us with fabrics of silk and other stuffs, the designs upon which were printed from wooden blocks, but this can hardly be called a reproductive process in the sense in which we are at present considering it. Thus, as the manufacture of paper practically dates from the first part of the fifteenth century, so about this time we come upon the earliest indications of successful wood-cutting.

The first xylographic specimen of which we have positive knowledge, dating from 1414, has been preserved for us in the museum at Brussels. I have promised to spare you any unnecessary historical divagations, but I should like to point out that the first important step forward taken by the art was in connection with what may not unfairly be called the earliest illustrated newspaper. This was the *Nuremberg Chronicle*, published in 1492, which contained something like two thousand engravings by Wohlgemuth, the master of Albert Dürer. In the blocks which illustrate the chronicle we find for the first time the employment of cross-hatching, a technical method by which tones of varying intensity are produced, which opened the eyes of contemporary artists to the inherent possibilities of the craft. But from the days of Wohlgemuth, Dürer, Cranach, Burgmair and Aldegrever, names and a period upon which I should be delighted to dwell at length, I must take a sudden swoop through the centuries until I arrive at our own generation. I am considering this evening more particularly the subject of illustrated daily journalism, and illustrative daily journalism came into real, breathing, palpitating existence only by the aid of the photographic camera.

Almost, if not literally, from the day of Daguerre the problem of producing, by photographic methods, blocks or plates from which, by purely mechanical means, a number of impressions could be taken, has occupied the minds of experimentalists. They were led almost at once on the right track by the experiments and discoveries made by Niepce, Monge Ponton, Poitevin and others, who discovered that various organic substances, such as gelatine, gum, albumen, and so forth, when mixed with a solution of bichromate of potash and various other salts of chromium, became curiously affected by the action of light. Though perfectly soluble under all conditions, without such admixture those portions of the bichromated gelatine, for instance, which were exposed for any time to the action of light, became absolutely insoluble in water. It was evident, therefore, that if a film of gelatine or albumen which had been rendered sensitive by bichromate of potash were to be exposed under a negative, those parts to which light could reach through the clearer portion of the negative would become insoluble, while those which were protected by the dense parts of the negative would still remain soluble. Thus, a film of gelatine, after exposure for a proper length of time under a negative, might be washed in warm water with the following result:—The high lights, which in the negative are dense, and therefore shield the film from the light, would be washed away, while the shadows which in the negative are clear glass would remain unaffected by the action of the water. If a positive instead of a negative were superimposed, the reverse would be the case—that is, the high lights would remain at the height of the normal surface of the gelatine, while the shadows would be hollowed out to a greater or less depth. Roughly speaking, it is by the first of these methods that relief blocks are obtained, while by the second photographic intaglio plates are produced.

Simple, as starting from these premises, the problem may seem, as a matter of fact it bristled with technical difficulties, and though it was in 1839 that Monge Ponton first published the fact of the sensitivity to light of chromium salts, it is only within the last decade that relatively satisfactory results have been obtained from photographic plates and blocks. The great difficulty which had to be overcome was the production of what is known as half-tone. An ordinary line drawing in black and white could be easily reproduced in the form of a relief block or an etching. Thus a plate of zinc, in one of the forms

* From the paper by Mr. Horace Townsend, read at a meeting of the Society of Arts.

of process etching most commonly in use, is covered with a bichromated film of albumen. On this a negative of the line drawing which it is wished to reproduce is superimposed, and the two are exposed to the action of light. The clear glass of the negative, which represents the black lines of the drawing, allows the light to freely penetrate to the film of albumen.

After a sufficient exposure the plate is washed, and by this means all that portion of the film which has not been acted upon by the light disappears. If these lines be now protected by a coating of some such substance as printer's ink and the plate immersed in a bath of acid, the unprotected spaces will be eaten away, while the lines protected by their hardened film will remain untouched, and a relief block is by this means produced. If, however, it is desired to make a process block from a drawing in wash, or from a painting, there are only two ways in which it can be done. Either those parts which are to print black or grey may be sunk to various depths below the general surface, and some mechanical means taken by which they will hold the ink, which, after being applied generally to the entire plate, is rubbed off carefully from the raised portions or lights, and an impression taken from the intaglio plate thus formed by the ordinary methods of copper-plate printing. This, under the most favourable circumstances, is a slow and expensive process, and cannot be worked in conjunction with ordinary printing. The desideratum, therefore, not only for newspaper illustrations, but for those of books and magazines, is a relief block which shall be able to print the graduated shadows, which are generally known as half-tones. As a matter of strict fact there is only one tone in any relief block, the half-tones or graduated shadows being produced by broken lines or dots of the absolute black, or at all events the single colour of the ink employed. The closer together these dots and dashes of black are placed, the darker will be the shade, while the further apart they are the lighter will the resultant tone be. This is, in fact, true, with one exception, of every form of engraving, photographic or otherwise, as even the delicate gradations and practically exact tonal values of the finest mezzotint are produced only by the relative closeness together or distances apart of the minute little bits with which the surface of the copper-plate is initially overlaid, and which are scraped away to form the high lights, and thinned down and made smaller and shallower by the scraping processes to form the intermediate tones.

The exception to which I refer is the photo-mechanical process known as the Woodbury-type, after its inventor, the late Slater B. Woodbury. Not to confuse you with unnecessary details, I may say that these processes consist in producing an intaglio in the ordinary way by the use of bichromated gelatine. The delicately shallow mould which is thus produced is filled with a thin ink lying more deeply in the shadows, and in the thinnest of possible films on the higher lights. When this ink is printed off on to the paper and allowed to dry, the darker shades are represented by a thicker and darker pigment, and a truly-toned picture is the result. In relief printing, half-tones must be reproduced by some sort of stipple or lines, or dots, as in the case of an engraving. The most ordinary process now in vogue to bring about this result is the employing of a fine network of criss-cross lines, which is interposed at some stage of the operation between the negative and the sensitised film. By this means the half-tones are broken up into a series of dots or lines which can be printed from after the manner of ordinary type.

Herr Meisenbach, in Munich, patented in 1882 a variation on this process, which is thus described in his own specification:—"The transparent plate is hatched or stippled in parallel lines. A transparent positive is made of the object which it is desired to depict. The two plates are joined preferably face to face. From the combined plate a negative is photographed in the ordinary manner. In order to cross-hatch and break the lines of the shading, the hatched or stippled plate may be shifted once or more during the production of the said definite negative. This negative is transferred in the usual manner to form a typographic block."

The greater the fineness of this network the more perfectly illusory is the resultant half-toned plate, and I may add that this screen, as it is termed, is usually produced by making a photographic reduction of one which is already ruled as finely as ordinary mechanical means will permit.

In order to reach the desirable end of breaking up the tones, other methods, as I have said, besides those of the Meisenbach screen are used. Thus one of the chief American inventors in the photographic process field, Mr. Frederick Ives, of Philadelphia, some years ago patented the half-tone process named after him, from which most artistically satisfactory results have been gained.

He used, I believe, a rubber pad on the surface, to which there were cut at right angles to each other minute V-shaped grooves, through whose agency the surface was thus converted into a series of tiny little combs. These are inked not only on the points, but on the sides. From a gelatine relief, inked in the usual way, by exposing a bichromated film under a negative and then washing away the unhardened portions, a plaster of

Paris reproduction was formed. Upon this was pressed the inked rubber pad, and the relief lines and surfaces were varyingly impressed with a series of inky dots which, owing to the expanding nature of the rubber, were larger where the pressure was greater owing to the relief being higher and smaller where the relief was lower, and so was either not reached by the little points at all or did not flatten them out. The shadows, which were in relief, were thus rendered by a series of larger dots, while for the highest lights the white surface of the plaster was left intact. Of this dotted rendering of the relief a photograph was then taken, and the negative thus obtained was used to prepare a relief block by any one of the ordinary processes. From some points of view the result is preferable to that of a Meisenbach block, for what is termed a differentiated grain is offered to us in place of the unvarying and mechanical grain, which alone can be produced by the netted screen.

The superior artistic quality of a differentiated grain is due to the fact that the largest dots are confined to the heavier and the smallest to the lighter of the tones, a truer gradation in tint resulting.

I have dealt, I trust you will not think at an inordinate length, upon the principles of photographic process engraving and etching (whichsoever, of two terms neither of them precisely correct, one may the more fitly employ) for two reasons. In the first place, I have always found the most surprisingly vague and hazy notions existing in the mind of otherwise well-informed people regarding the difference between an etching, a steel engraving and a woodcut, and as the limitations of illustrated journalism are dependent entirely upon these technical differences, it is as well at once to get the main principles plainly set out before us. I have confined myself to the photographic processes, because, as I have already hinted, the true history of illustrated journalism, as we understand it to-day, began to be written when Poitevin produced his first plate, etched by the indirect agency of the photographic camera. It is interesting maybe to refer, as I myself have briefly done, to the *Nuremberg Chronicle*, or, coming nearer home, to the occasional appearances in the earlier "Diurnals" and "Messengers," which took the place in some degree of our modern newspapers, of rude woodcuts which, in more or less haphazard fashion, aimed at eking out the scanty and brief written account of some happening of unusual importance. But it is interesting only as affording conclusive evidence of the inherent desire of people of all ages and of all centuries to stimulate their imagination by graphic representations of the persons or objects concerning whom they are reading.

It is not indeed of any much greater practical use to give more than a passing glance at the weekly story papers, which were the earliest examples in our own century of what may be called illustrated journalism. These had a part to play in its development, and played it well. They taught the people to look for illustrations as a welcome addition to their current literature, and they assisted in the formation of a school of illustrators, who for many years led the van of progress in the world of black and white art. It was on the *London Journal*, for instance, if I remember the name aright, that Sir John Gilbert first manifested those extraordinary powers of facile draughtsmanship and rapid execution which, had he begun his artistic career in the "nineties," would have made him probably an ideal daily newspaper illustrator.

Haste was a main factor in the carrying out of the work, both literary and artistic, on these periodicals. It is a tradition, indeed, that just as a printer's devil was wont to sit waiting in the hall of the author while the latter scribbled the concluding lines of his week's instalment of the current "to-be-continued-in-our-next" narrative, so the lad from the engraver's would wait upon Mr. Gilbert with the wooden block, on whose surface the rapid pencil of the illustrator was to sketch the lovely form of the heroine in some moment of poignant distress, with instructions from his master not to leave the house until the drawing was made. This haste and procrastination sometimes led to consequences which might have been disastrous had the readers of the journal been more exacting or more gifted with artistic perspicuity, for the artist would shirk the onerous task of reading the manuscript which he was illustrating, and making a sketch entirely "out of his own head," as the children say, would depict his hero and his heroine under circumstances which, though doubtless picturesque, had not unfortunately the faintest resemblance to any of those described by the unhappy author. But this rapid, if perfunctory, method of working led to a corresponding facility and speed of execution in the case of the wood-engraver, and so prepared the way for the rapidity of execution which was necessary when the weekly papers, and notably the *Illustrated London News*, which professed to give every week pictures of current events, came into existence. As time went on, and as the *Illustrated* waxed in importance, and was hard pushed at one time or another by its more or less successful rivals, this rapidity of production became of the utmost importance. The appetite of the public for illustrations of current events which should appear in the pages of the weekly papers within a few

days of their happening at the farthest, grew with what it fed upon. It was no longer possible either for pictures to be prepared beforehand bearing only a remote and conventional resemblance to the actuality of the subject they professed to illustrate. They had to be drawn from actual sketches taken on the spot by "Our Special Artist."

Now, as wood-engraving is a slow and laborious process at the best, and as the blocks required to satisfy the public taste had to be greatly increased in size, not a little ingenuity was necessary in order to overcome what were apparently the mechanical impossibilities of the task. The means finally hit upon was an ingenious one, and one which is not only in vogue to-day, but which were it not for its exceeding expense might have perhaps prevented the daily newspaper illustrator of to-day from his entire dependence upon the photographic processes, and thus doubtless have hindered the extraordinary developments in the last-named field. The wood block on which the picture was drawn was formed of a multiplicity of small blocks carefully fitted together and bolted firmly up so as to form a homogeneous whole. On this surface the design was drawn, the bolts and screws connecting the parts were taken out, and one portion of the subdivided picture, which thus resembled a child's puzzle-block picture, was given to each engraver, who set to work on his particular little square with all speed. When each had finished his work the blocks were once more screwed together, and a large woodcut was thus produced in a twentieth or thirtieth part of the time in which it could have been accomplished by the ordinary method.

There was for many years no temptation to the process engraver to produce anything but the cheapest work, and the cheapest, as we all know, is, has been and always will be the nastiest. For their best effects the great weeklies were perfectly content to remain steadfast to the wood engraver. The latter could at least, by the method to which I have referred, produce his blocks within as short a space of time as the needs of weekly publication rendered necessary, and if they cost a little more than others, why, the proprietors were making at least living profit, and what did it matter?

But this attitude could not for long be maintained. The happy results which attended the unremitting efforts of Continental and Transatlantic process workers began to attract the attention of the proprietors of English illustrated papers, until slowly, but surely, the process block began to oust the engraved wood block from its position in the pages of the weeklies. At first, indeed, the reaction from the primary indifference was, as all reactions are, excessive, and the cry went up that the occupation of the wood engraver was gone. So far from this, we see to-day that the very growth of process work has elevated the art of the wood engraver, and though the weaklings and useless have been killed off, the masters have received no such recognition, pecuniary or otherwise, since the modern school of the art was almost created by Bewick. Firm as is the belief I hold in the almost unlimited possibilities of photographic process, I should be sorry to think that its growth meant the extinguishing of the radiant light of one of the most glorious of the reproductive arts. But the daily papers were slow to grasp the opportunity, nor yet have they made up their minds to give more than a tentative shake to the tree which, in another country, has been found to bear such golden fruit. A few outline portraits, poor alike in conception and execution, and which are rendered still poorer by incompetent printing, and an occasional architectural sketch, mark almost the furthest point to which the afternoon dailies have advanced.

Some 3,000 miles away, however, in the United States of America, a very different state of things prevails. That daily journalism in America should have made advances, coy at first, but later on more passionate, to the muse of illustration—if such a one there be—is due, in my estimation, to no extraneous or easily definable cause, but to the entirely different position which journalism holds in that country compared to this. The American newspaper stands to a majority of its readers in the place of literature in general. But this, I think, is not because the readers have no taste in themselves for literature, but because the newspaper endeavours, as nearly as may be, to be in itself a compendium of literature. It is a sort of octopus, whose long and ever-active arms clutch from every quarter of the literary and journalistic field, and convey to the main body, there to be digested, whatever they may find of energy and enterprise. Let this voracious creature find that there is a demand among the people for serial fiction—let me say, for example's sake—which is being supplied by some publication specially devoted to this field, and one of its tentacles immediately becomes active and adds fiction to the main body. Are certain journals supporting existence by catering to those classes which are interested in sport, or in music, or in the drama, or in art? Immediately the daily adds departments of sport, music and so forth, which, owing to the numerous capital at command, are even more efficiently carried out than they would be in the specialists' hands. It was, in my opinion, the striking advances in the art of illustration made by the American magazines, advances which form almost a

commonplace of comment in Europe as well as in America, that led the newspaper proprietors in the same direction.

Tentative at first, and not very promising, were the illustrative experiments made by the New York dailies. They were confined to the simple outline portraits and sketches which it was then possible for photographic process to produce for the needs of rotary printing. I may be pardoned if I digress here for one brief moment to point out that the ideal method of printing, so as to gain the most satisfactory results, either from type or engraved blocks, is the old-fashioned hand-press. Next to this comes flat-printing by machinery, in which the sheet of paper is automatically pressed down upon the body of type which lies in a horizontal position. The daily newspaper, however, with its circulation of hundreds of thousands, must be printed on what is termed the rotary press. The actual type in fact, which is set up by the compositors, is not printed from at all. Instead, a sort of mould of it is taken in moist paper, which is subsequently so dried and hardened that when it is bent into a semicircular form a cast can be taken from it in type metal. Two of these casts put together then form a cylinder which, when placed upon an axle, inked and revolved at a high rate of speed, prints upon a sheet of paper which is made to travel beneath it many thousands of impressions per hour. It was the practical difficulties connected with this rapid form of printing which caused newspaper illustration to be looked at askance for many years. It was not, indeed, until the *New York Herald*, with its great circulation and the almost unlimited capital which was behind it, took the matter up and resolved to enter seriously into competition with the publications which relied upon their illustrations alone, that any marked developments began to show themselves. These followed each other, however, with extraordinary rapidity. They all had been theoretically possible, and it only required the nicest mechanical adjustment to turn them into actual facts. Process work under the kindly stimulus of the magazines, such as the *Century* and *Harper's*, had been making gigantic strides. In line work the reproduction of the finest lines and the most intricate and closest of cross-hatching and shading had become not only possible but easy, while the half-tone processes had rendered the exact simulation of wash drawings an everyday affair. The necessary element of speed, too, was not forgotten, and carefully finished blocks were turned out within the space of a few hours, which, not many years before, would have required almost as many days for their efficient production. The printer, too, kept pace, to some extent, with the process engraver. He very soon discovered that the finest of lines left its impress upon the papier-mâché matrix as well as the coarsest, and that the stereotyped cylinder cast therefrom rendered it in the required relief with scrupulous fidelity. Even that mystery of mysteries, the overlay, was partially overcome, and yet, with all these advantages, newspaper illustration was at best a somewhat unsatisfactory performance. It had taken many years—more than a lifetime, in fact—to so perfect the news-gathering system of the American newspaper that it should work smoothly without friction and as one harmonious whole. It was not to be wondered at therefore that there was more promise than performance in the early attempts in this direction, even of the greatest of the daily journals. Artists were slow at first to understand that, just as a newspaper writer has to eschew certain literary graces and appeal forcibly and directly to his audience, so the newspaper illustrator has to lay aside some of his pet conventionalities, admirable as they might be elsewhere, of artistic expression. Process workers hesitated at throwing overboard traditions and methods which, though recently acquired, were none the less deep-rooted. Plates which should have reached the composing-room at one hour straggled in during the course of the next, when, owing to the exigencies of the "make-up," they might just as well not have made their appearance at all. It took but a very short time for the proprietor of the *New York Herald* to see that either a radical change was necessary, or that the task of illustration had better be left to the weekly and the monthly publications.

He decided upon the former course, and made at once the illustrator and the engraver an integral part of the general machinery of his newspaper office. His example was to a certain extent followed by others, and then, and not until then, newspaper illustration in America took the enormous stride forward which tends to give promise even now that at no very distant date the daily paper will take the place in the affections of the picture-loving people, not only of the weekly journal, but even of the monthly magazine. A staff of illustrators work in the *Herald's* new building side by side with the staff of reporters, and while the latter are employed in scribbling off their copy, the former just as quickly sketch the main incidents of the event which is being described. While the reporter's copy goes into one part of the building to be set up in type by the compositor, the illustrator's drawing goes into another department to be photographed and engraved, without the loss of one second by the process workers. In like manner, just as carefully collected news memoranda are preserved which will

be useful should reference be made in the course of an article or a news despatch to some noted personage or famous place, so portraits and views are collected with unwearied diligence and care, fully filed away for the artist's reference upon the instant of necessity. Again, just as from time to time it has secured the services of some prominent or literary man to add some special daintiness to the literary fare set before its readers, so the *Herald* is wont, as occasion may arise, to supply them with facsimiles of the artistic impressions of painters and draughtsmen of world-wide reputation. That a journalistic departure from the beaten track attended with such difficulties, mechanical and otherwise, should have been marked by an immediate degree of success is little short of surprising; that perfection should not at once have been attained is not to be wondered at.

For the past decade the problem of colour-printing, otherwise than by lithography, has monopolised the attention of process workers in Paris, Vienna, New York, and in one case at least, in London. Without attempting to discuss the matter from the empyrean heights of abstract art, I may, perhaps, be permitted to take for granted that, in popular estimation, a coloured picture is more attractive than one in simple black and white, for it leaves so much less to the imagination—a function in which the average man is woefully deficient. Starting on this hypothesis it was evident that a process which would admit of the printing of a block in several colours conjointly with type, would be of enormous commercial value. The problem of intaglio colour production by photographic process had been triumphantly solved by Goupil, of Paris, who, however, employed the most careful of hand-printing to attain his results, and who after all rivalled and did not excel the results produced in our own country a century ago by that school of mezzotint engravers whose artistic value we are only to-day realising. It is, indeed, the printer rather than the process maker who has retarded the development of a relief colour-printing, for it is clear to those who have the most elementary knowledge of the theory of lithographic printing, wherein a multiplicity of shades of colour are produced by the superposition of the primary and secondary colours, that a series of relief plates to serve the purposes of the various tint stones of the lithographer could be easily prepared. As a matter of fact, this has long been possible, and Mr. Hare, of our own city, to-day turns out process blocks for relief colour-printing, by means of which the most delicate gradations may be employed. A machine for printing these at a high rate of speed was, however, the desideratum. At first, the nearest approach to this was a press which printed colours in mosaic only. That is, each tint had a separate block, and no attempt was made to secure effects by gradation, or by the printing of one colour over another. Very charming effects, as the French have shown us, can be produced in this manner, but it yet stopped short of what was needed, especially as the process was a comparatively slow one. Then the proprietor of the *Petit Journal* invented the quick press which bears his name, and which is, in this country, used by the proprietors of *The Million*. In America, as the *New York Herald* coloured supplements will show you, an even closer approach to complete success has been made. These pages are printed on a press of the "Hubert" pattern, which prints at a high rate of speed and gives two colours at one feeding. Within a week or two, however, the "New Hoe" press, which has taken many months to build, will be in running order. This will produce much more elaborate work, printing eight pages in four colours from a continuous roll of paper at a speed of many thousands per hour. Should it indeed do nearly all that is confidently claimed for it by its builders, it will almost revolutionise the art of colour-printing from a rotary press.

I should not, however, like to say that the problem of colour-printing will be solved even when a press which will print its eighty or ninety copies a minute is built, and is found to work with consistent exactitude. So far we are all, artistically speaking, groping more or less in the dark, and in some directions, at all events, the popular work of the day is hopelessly away from the proper track. To take an ordinary wood engraving or process block and smear a lot of colour over sundry portions is not the way to produce a colour print, though in some quarters—which I need not particularise—this fallacy seems to have gained ground. The machines and the mechanical executants may be as perfect as in this imperfect world of ours is possible, but the right material to work upon must be given them at the start, or the results will never be more contemptible. That it is comparatively easy to produce an exact facsimile of a water-colour sketch, provided certain limitations have been frankly recognised by the original artist, some of the exhibits which I show to-night amply prove; and so it comes to this, that it is to the artist rather than to the printer or the process maker that we have to look for improvement.

Centuries ago, half of the problem was solved for us by the Japanese, and I only wish it were possible to show you to-night some of those exquisite examples, informed from start

to finish with creative beauty and yet subservient to the truest principles of reproductive art, which are at present being exhibited here in London in a well-known art gallery.

Much of their finest effect is due, of course, to the fact that the touch of the artist has been present at every stage of their production, and a major portion of the beauty therefore we can never, so long as the world shall roll, hope to rival by mechanical means. But the underlying principles which are based on their instructive appreciation of the balance of tones and on their masterly use of broad colour effects, to which delicacy is imparted by subtle though simple gradation, may with advantage be studied by the colour draughtsman for process reproduction of to-day. Finally, the limitations of the process must be frankly recognised and borne in mind from the first moment that the artist lays brush to paper, and it will then be found, as in the case, for instance, of such other branches of art as stained-glass work and mosaic, that these very limitations may, instead of curses, prove blessings, and perhaps the chiefest of artistic glories.

THE OBSERVATION AND CREATION OF BEAUTY.

THE annual meeting of the friends of the Municipal School of Art, Birmingham, was held on Wednesday in last week, when Mr. William Morris delivered an address. According to the *Birmingham Daily Post*, Mr. Morris said he had first to speak to the general public about the art which their school represented, and next to the students of the school about their position and aims. We were not yet quite on the right road towards a satisfactory condition of art. When he said "we" he did not mean this country especially, for though in France, Germany, Italy and elsewhere there were still more or less survivals from foregoing periods during which art was common to the whole people, those survivals were being extinguished under our very eyes, and in the course of a few years there would, for example, be nothing more interesting in the peasant life of Italy than in that of England or America. All nations must go through the mill in which the commercial period is grinding us, and England had at least this advantage that she was thrown into the hopper first, and as a consequence was showing signs of a consciousness that there was a future for art. In short, we were willing to rebel against the tyranny compounded of utilitarianism and dilettanteism, which for the greater part of this century had forbidden all life in art. As yet, however, we did not quite know what form our rebellion was to take. As to this, he felt that he could not do more than generalise, and he would say, first, that in order to have a living school of art the public in general must be interested in art; it must be a part of their lives—something they could no more do without than water or lighting. They must not be able to plead poverty, as they did now, as an excuse for ugliness or dirt. If they raised a building, whether it were a palace, factory, or cottage, it must be a thing well understood that it must be sightly. If a railway had to be run from one place to another, it must be taken for granted that the minimum of destruction of natural beauty must be incurred, even if that should increase the cost of the line largely. Disfiguring waste of coal-pits or manufactories must be got rid of, whatever the cost might be, and so on. And, mind, all this, which was the only possible foundation for art in modern times, was quite possible to be done, and would be done as soon as people cared about it. To put the matter quite plainly, as things went now we as a community were content to be publicly poor so long as some of them were privately rich. Though the income of the country was enormous in figures, no man could go a few yards from his own door without seeing the tokens of quite desperate public poverty. He admitted that within the last dozen years there were signs of healthy discontent with this monstrous discrepancy between our powers and our practice, and in one direction especially a new spirit had arisen which, to begin with, had given us instruments through which the revolt against stupid utilitarianism could work. He alluded to the development of municipal life among us. He knew how Birmingham had for long taken a leading position in this development, but now they were seeing what some of them had scarcely expected to see, London playing its part herein, and that in spite of its being so weighted by its unmanageable size and its position as a centre of government, of politics and of intelligence—that was to say, in spite of its being of all places in the world the very representative of the commercial epoch. Whatever mistakes the London County Council have made, it was awake to the fact that it owed to the citizens some account of the external decency of their brick and mortar county, and there was a feeling that something might be done even in these passing years to make life better worth living in London. All things considered, he believed there was a growing sense that it was a disgrace to a period in which mankind

had gained such mastery over the forces of nature that the commonwealth should be so poor. Such a feeling was and must be the basis of modern art striving to free itself from the thralldom of utilitarianism, and the Correggiosity of Correggio. In considering the question, How were we to work on this basis, and the hopes there were of art in these islands, Mr. Morris disputed the dictum that used to be popular in dilettante circles that the English were essentially a non-artistic people. As a matter of fact, until art failed throughout civilisation the English had a very definite style of art of their own, which closely expressed their thoughts and their lives, and of which beauty—almost, it seemed, unsought for—was an essential part; while, as far as our own days were concerned, it was, as he had said, to non-artistic England that some glimmer of insight into the possible future of art had come. In short, it was no use going further afield than this country to find the artists and craftsmen that we need. Although the capacity for art, and the desire for it, was not yet extinct among us, yet it was mostly dormant. People in general who did not earn their livelihood by using their eyes did not use them; which, of course, considering the state of the popular arts amongst us, saved them a great deal of suffering, and probably lengthened their lives. It was, however, desirable to awaken them to that “divine discontent” which was the mother of improvement in mankind.

The essential thing was that people generally should be capable of receiving impressions through the eyes, and this process should be a joy to them, just as their receiving impressions through their palates or their ears. In order to get people to use their eyes, those who had not lost the use of their eyes should go on pestering the rest of the public until they had more or less convinced them that it would be a good thing for them to recover their capacity for seeing, just as it would be a good thing to recover the use of their legs if they were lame. There were two things to be done by the seers for the non-seers: the first was to show them what was to be seen on the earth, and the next was to give them opportunities for producing matters the sight of which would please themselves and their neighbours and the people who came after them—to train them, in short, in the observation and creation of beauty and incident. What then was worth seeing on the earth? Everything. This to love and foster, and that to hate and destroy. Speaking more of those things which the eye bade us to love rather than those which it bade us hate, Mr. Morris said there were two kinds—the beauties of nature and the beauties of art. Concerning the former our fault was that, for the most part, we refused to pay attention to anything in nature which was not tremendous or exciting. It must be an Alpine pass or a rocky sea-shore, or the richness and luxury of an Italian landscape, or at least a piece of mountain in Scotland or Wales. Less than that would scarcely draw our eyes to the beholding, yet he must tell them that if they could get no pleasure out of the sight of a Warwickshire meadow, or the hedgerows and little waving hills of Essex, or the flat fields and limestone banks of Oxfordshire and Berkshire, he doubted their capacity for really seeing the huge Swiss mountain and valley scenery, or the flank of the Appennine, or the fairyland of Garda Lake, or the terror of the Thrasymene. In short, what modern landscape visitors usually failed to see was a certain something called “character,” which did not depend upon bigness or roughness or richness, but which meant the expression of a human interest, the telling of a tale of life and interest, the touching of the imagination through the eye. He promised to any one who went with open eyes some month or two hence into any unspoiled countryside that they would find almost every field’s end a paradise, that would cry out to them, in a voice not to be resisted, “Love the earth which you dwell upon and the soil which nourishes you.” But even here, in the hedgerows, the roads and lanes, and other features, the aspect of the place was largely influenced by the work of man. They were, in fact, brought to that transition between the works of nature and art which, when they were happily harmonised, produced the greatest pleasure the eye could have, and appealed most directly to the imagination. If our forefathers lacked the romance of the great walled towns of the Continent, they had as a compensation abundance of ancient villages, with their small but beautiful churches, full of individuality and character, and their generously-built manor-houses and home-steads, which between them all once made an English countryside a special treasure not to be seen anywhere else. Grievous as had been the injury to this treasure-store, and much as we had been robbed of it by our own folly and blindness, there was still enough of it left to teach and delight us. He did not wish them to suppose that he was an advocate of the tumble-down picturesque, for he advised them to keep their village houses weather-tight, trim and useful; and, when they must, build others beside them. But why when they built these should they make them specimens of the worst buildings in the worst suburbs of a modern town? Even in the passing day, if they built them solidly and unpretentiously, using good materials natural to their own countryside, and if they did not stint the tenant of the due elbow-room and garden, it was little likely

that they would have done any offence to the beauty of the countryside or the older houses in it. Indeed, he had hope that it would be from such necessary unpretentious buildings that the new and genuine architecture would spring rather than from their experiments in conscious style more or less ambitious, or those of which the immortal Dickens had given them the never-to-be-forgotten adjective “architectooralooral.” The manner in which their buildings, and especially their houses were built was really the foundation of art, and if they could not build fit and beautiful, not necessarily highly decorated, houses, they could not have art at all in their days. Neither could any work of art—not even the greatest work of art, a beautiful woman—look well in a bad house. That being the case, and their modern houses being undeniably, and even, it would seem, wilfully bad for the most part, he begged of them to take care of their old buildings which were good. Touching again upon the non-use of the eyesight, Mr. Morris drew attention to the awakening of a taste for Mediæval art about the beginning of the century, and the subsequent work of eminent architects in the direction of producing new buildings and the restoration of old ones. Unhappily, he said, they never brought their quasi-knowledge to the test of the eyesight, and the result had been that they had most seriously injured all the great cathedrals of England and almost destroyed some, while of the parish churches it was only here and there we came across one which had only to contend against neglect and the churchwardenism of the last two centuries, and had not had added to the conspiracy against its life the well-meant but disastrous attacks of the restorers. He appealed to his hearers with some hope as intelligent and in this case unprejudiced observers, to help to put an end to this folly of restoration, and he felt sure that the guardians of old buildings might safely leave the question of restoring them to what they had never been to a period when we had at last conquered a genuine style of architecture of our own, and let that age settle the question. Meanwhile, to guard their ancient buildings against brutal destruction and egotistical falsification seemed to him to be one of the prime duties of those who were trying to make people use their eyes, for if people could not see these they could see nothing, and they should acknowledge their defect, and leave the dealing with such works to those who had not the defect.

To the art students he wished to say particularly that unless they were acting in pure error, they had, in establishing and fostering a school of art, accepted the position that it was desirable that people should be taught to use their eyes, and that when they had learned to do so in ever so little a degree the natural result must be an irrepressible desire to create works of art. He wished to dwell upon the words “an irrepressible desire to create,” for he always had, and always should when he had the opportunity, warn young people against looking on the practice of the arts as a mere profession, a career to be chosen for the earning of livelihood. He was often consulted on this point, and his answer was always the same—“If you are quite sure that you have got in you the irrepressible desire, you need no test of capacity to begin with; you will yourself know that you have in you some power of creation. In that case, do not hesitate, but throw yourself into it, for better or for worse, and take what will come. But if you do not feel you have the capacity or desire, then by all means, if you can, study art as a recreation or a piece of education, but do not pledge yourself to live by it; for if you do you will be a burden to art, and will, if you have the insight which a serious person ought to have, feel yourself to be in a false and ignominious position.” This warning was more necessary than ever, he thought, because most men who had any character or strength of will could by concentration and diligence learn the practice of a profession which they were not really fit for; and this very commonly happened in the arts, and produced men who, as far as the arts were concerned, were mere mechanical pretenders, though not necessarily so wilfully. Therefore he advised them to make themselves sure that they had in them the essentials of an artist before they studied art as a handicraft by which to earn their bread. But if they were able to do this, and became genuine handicraftsmen, he congratulated them on their position, whatever else might happen to them, for they then belonged to the only group of people in civilisation who were really happy, persons whose necessary daily work was inseparable from their greatest pleasure. Let them, however, remember that *noblesse oblige*; such happy people as they were could not put up with the follies and dishonesties which they forgave in less fortunate people—bishops and prime ministers, and generals, landowners, great capitalists, and the like. They must be absolutely faithful to their art, and severe judges of their own work. It was clear to him that they had amongst them those who were using their eyes well in the direction of that sympathy with characteristic landscape which he had spoken of before. There was already much; a whole school could be founded on such observation and sympathy, and such a school might have quite important results in teaching the general public to see. He dare say they were being told that they were getting mannered, and he asked them

to attend to that warning, though it might, in some people's mouths, mean nothing except that they had no eyes for the ornamental side of art. The corrective to over much manner was, first, diligent study of nature; and, secondly, intelligent study of the work of the ages of art. The third corrective was infallible if they had it—imagination. If they had not got it he recommended them not to pretend to it; they had better give up art altogether. Hardness must be guarded against, but he would remind them that a design might be very clear and precise without being hard. The hardness came, he thought, from using ugly lines, wiry or edgy; or from overshadowing, not from precision. A word as to colour. It was clearly impossible to teach colour by words, though it could be partially taught in a workshop. They should be rather restrained than over-luxurious in colour, or the eye would be wearied. They should not attempt over refinements in colour, but be frank and simple. Above all, they should not attempt iridescent blendings of colour, which looked like decomposition. To those who were designing figure work he would say, "Do not spare yourselves in drawing from the living model, draped as well as undraped; in fact, draw drapery continually, for remember that the beauty of your design must largely depend on the design of the drapery." He would end by saying that he, an old man now, had been much encouraged with what he had seen of the enthusiasm and aspirations on the right road of the Birmingham School of Art. He begged them to go on encouraging the last generation, so that the future generation might need no encouragement, save that which they would obtain from their own work—the pleasure of creating beautiful things, which was the greatest pleasure in the world.

Alderman Kenrick proposed a vote of thanks to Mr. Morris for his address.

Mr. J. T. Bunce seconded the resolution.

Mr. Morris, in responding, bore testimony to the change for the better which had taken place in the school. There was no doubt many of them had got their heads turned in the right direction. In addition to the work of Mr. Taylor, the students had enjoyed, in his opinion, a great advantage in being able to see the transcendent merits of the works of his dear friend and their own citizen, Edward Burne-Jones. Some people said they were wrong in following him, but he reminded them that the most original men began by following somebody else. He therefore bade them not to be discouraged at being told that they had done wrong, provided they did not content themselves with this, but endeavoured to show what they had got in themselves.

PROPOSED MONUMENTAL CHAPEL AT WESTMINSTER.

THE following letters have passed between Mr. Yates Thompson and the First Commissioner of Works:—

26A Bryanston Square, W.: Feb. 16, 1894.

My dear Lefevre,—In common with all who regard Westminster Abbey with interest and veneration, I have been greatly impressed of late years with the increasing difficulty of finding space for the continuation of the unrivalled series of monuments of those whose memory the country desires to honour. It is admitted on all hands that there is no longer any space in the existing building for even the most modest memorial without interfering with the architectural beauties of the structure, or unless, as in the recent monuments to Henry Fawcett and James Russell Lowell, they be placed where the sculpture is almost invisible and the inscription quite illegible. This, indeed, was the conclusion of the Royal Commission on the Abbey which reported in 1891, and which was unanimously of opinion that an addition ought to be made to it, although they differed as to how this best should be effected.

It is probably owing to this difference of opinion that neither the late nor the present Government have seen their way to proposing any definite scheme to Parliament on the subject.

Under these circumstances it has occurred to me that it may be open to a private individual to make an offer which may lead to satisfactory action in the matter.

I have carefully considered the plan which Mr. Pearson laid before the Royal Commission for the erection of a monumental chapel connected with the Abbey by a cloister leading from Poets' Corner round the north-east side of the chapter-house to the new building which would occupy the site of some of the houses which at present disfigure Old Palace Yard, and Mr. Pearson has permitted me to see the designs for the building which he laid before the Commission, but which were not published with their report. The full design involves the erection of a considerable building, but Mr. Pearson pointed out to the Commissioners that it would not be necessary to erect the whole of it immediately, but that all requirements for years to come would be met by the erection of the two smaller aisles of the main building. One of the chief merits of the scheme is that it will involve the removal of the houses in Poets' Corner and in Old Palace Yard up to but exclusive of

No. 5, which have been condemned by the Royal Commission as positively dangerous to the Abbey from the risk of fire, and the demolition of which would open out a view of the beautiful chapter-house, with which Mr. Pearson's proposed new chapel would make an effective and harmonious group.

Mr. Pearson has been so good as to make for me a rough estimate, which he believes would not be exceeded, of the cost of erecting the first part of this building. Including the two smaller aisles and the connecting cloister, and including also the expense of the railings, paving, architect's commissions, &c., he brings out a total somewhat under 38,000/. This, however, does not include the cost of the site and the removal of the houses in Old Palace Yard and Poets' Corner. I understand from you that the Ecclesiastical Commissioners, who are the ground landlords of these houses, the leases of which are about to fall in, are prepared, in consideration of the danger from the houses of fire to the Abbey and of their condemnation by the Royal Commission, to accept something less than half the actual value of their interest in the property.

Apart from the provision of the site, I am willing, as a contribution to so national an object, to give the sum which may be necessary for the erection of the building itself and its accessories not exceeding the amount of 38,000/. I shall be prepared to hand over 20,000/. as soon as the site shall be made available for building, and the balance when the structure is half finished, and I will leave this offer open for twelve months from the present time.

If this offer be accepted I should stipulate:—

1. That the new chapel form part of the Abbey.
2. That the additional space obtained be appropriated for the erection of future monuments only.
3. That arrangements be made for the maintenance of the new building, and that no fees be charged for the erection of monuments in it.
4. That it be open to monuments of the class to which the Abbey has of recent years been appropriated, viz., the memorials of those men and women who may be adjudged to have rendered distinguished service in literature, science and politics, or philanthropy to the British Empire or the Anglo-Saxon race.
5. That the name of the donor be legibly inscribed on stone somewhere near and inside of the main entrance.—I am very truly yours,

H. YATES THOMPSON.

The Right Hon. G. Shaw-Lefevre, M.P., First Commissioner of Works.

H.M. Office of Works, S.W.:

February 24.

My dear Thompson,—I have had very great pleasure in submitting to the Government your offer to undertake the whole cost of the erection of a monumental chapel, or rather so much of it as it would be at present desirable to erect, in connection with Westminster Abbey, upon the site of some of the houses in Old Palace Yard, provided that the site be cleared for the purpose.

I desire on the part of the Government to thank you for this most generous offer; and I am certain that you will not think them wanting in appreciation of your great liberality if I explain the circumstances which impose upon them the necessity of very full consideration in dealing with the matter.

I need not remind you that the Royal Commission of 1891, while unanimous as to the expediency of making an addition to the Abbey for the purpose of continuing the roll of monuments of those whom the nation desires to honour, were evenly divided as to the best mode of effecting this. One-half of them, including my predecessor at the Office of Works, Mr. Plunket, were in favour of erecting a chapel by the cloisters, on the site where the refectory formerly stood; and the other half recommended the site in Old Palace Yard, to which your offer is confined.

As you are aware, I have for a long time past been favourable to the latter scheme, and should be very glad to see it carried out. But in a matter involving an addition to a building held in such reverence as the Abbey, and where there is such difference of opinion, I could not take upon myself the responsibility of advising the Government and the Dean and Chapter of Westminster as to the best mode of effecting the object in view. The question must be referred to the highest authorities who are competent to form an opinion upon it.

The Government consider that, before undertaking such an inquiry, it will be expedient to remove the houses in Poets' Corner and Old Palace Yard, in accordance with the recommendations of the Royal Commission, who were unanimously of opinion that they are not only a grave disfigurement to the Abbey, but a cause of danger to it from fire. When these are removed, it will be more possible to form a judgment as to the effect of an addition to the Abbey in this direction on the plans of Mr. Pearson.

I had already, before the receipt of your letter, been in communication with the Ecclesiastical Commissioners, who are the ground landlords of the houses in question, with a view to carrying out the recommendation of the Royal Commission.

The Government, with the co-operation of the Ecclesiastical Commissioners, intend to lay before Parliament in the ensuing Session a scheme for the removal of these houses. Until this is effected I think you will agree that it will be better to defer giving a definite answer to your proposal, for which I must again express most cordial thanks.—Yours very truly,

G. SHAW-LEFEVRE.

Mr. H. Yates Thompson.

ARTISTS' VOLUNTEERS.

ON Wednesday in last week Sir Frederick Leighton, hon. colonel, distributed the prizes to the 20th Middlesex Rifle Volunteers at the headquarters, Duke's Road, Euston Road. Colonel R. W. Edis, F.S.A., the commanding officer, in presenting the annual report, said that the corps still upheld its high state of efficiency, and now numbered forty-eight over its proper establishment. Sir Frederick Leighton, before distributing the prizes, commented upon the great progress made by the corps during the thirteen or fourteen years which had elapsed since he reluctantly gave up the active command of it. During the years in which he commanded it one idea was always dominant with him, and that was to prevent their falling into an attitude of indifference or dilettanteism in regard to the great public duty that they had undertaken to fulfil, and to keep before them the grave responsibility they had assumed in entering the ranks of the Volunteer force. Recent affairs in South Africa had shown what Volunteers were capable of doing, and the lesson taught by what had happened in that country, he was convinced, would not be lost upon them. Colonel Gascoigne, of the Scots Guards, the brigadier of the South London Volunteer Brigade, expressed his great appreciation of the work of the battalion, which, he was proud to think, formed part of the brigade he had the honour to command. The distribution of prizes was followed by an assault-at-arms.

THE KIRKCALDY HALL COMPETITION.

WE have been asked to publish the following correspondence between the Town Clerk of Kirkcaldy and the hon. Secretary of the Edinburgh Architectural Association:—

The Secretary writes on December 23, 1893:—As instructed by the Council of the Edinburgh Architectural Association, I beg to enclose representation from them with regard to proposed Beveridge Hall, &c., competition, and to request that you will be good enough to submit it to the committee as early as convenient.

(Enclosure.)

Princes Street, Edinburgh: Dec. 23, 1893.

A copy of the conditions laid down by the Provost, Magistrates and Town Council of Kirkcaldy, for the guidance of architects who may feel disposed to compete for the erection of the Beveridge Public Hall, Free Library, and Adam Smith Memorial Hall has been laid before the professional practice committee of the Edinburgh Architectural Association, and with a request to examine the document and report to the Council of the Association thereon.

This they have done, and I am desired in the name of the Council, who have carefully considered the report, to draw attention to three points in these conditions which, in their opinion, are highly objectionable, and which they trust the Provost, Magistrates and Town Council may see their way to amend.

These points are—(1) The amount of commission offered; (2) the power reserved to retain the three sets of designs for which premiums are offered, without employing the author of the first premiated set to carry out the work; (3) the absence of any provision for the engagement of a professional assessor.

As regards—(1) The amount of commission offered being 4 per cent. is one-fifth less than the commission recognised by the Royal Institute of British Architects and the other architectural associations in the United Kingdom, and the result will be that architects of standing who conform to the rules of the profession will be deferred from competing.

(2) The absence of guarantee that the architect of the first premiated set of designs will be employed in the erection of the buildings is quite sufficient to prevent any competent practising architect from competing, as there is no inducement to him to spend time in preparing designs which may cost him the amount of the premium to prepare—possibly more—and so leave him without any legitimate reward for his labour.

The second and third sets should be returned to their authors, as no architect with any respect for himself would appropriate the work of another competitor. Presumably the premiums are offered as some compensation for the trouble the unsuccessful competitors have been put to, and not as representing the value of the designs. This being so, there can be no objections to the said drawings being returned to the authors.

(3) The absence of any provision for the engagement of a

professional assessor will inevitably prevent many architects from submitting designs, as it is quite evident that, however able and well-intentioned a lay committee of judges may be, there are many points both technical and artistic which can only be fully appreciated by an architect who has made the study of planning and designing the business of his life.

It is observed that the total cost, including three halls, library, subsidiary buildings, boundary walls, architect's and measurer's fees, and clerk of works' salary, is not to exceed the sum of 12,000*l.* sterling. The Council of the Association had not an opportunity of examining the extent and situation of the proposed site, but it occurs to them that the sum of 12,000*l.* will prove very insufficient for all that is stipulated for, especially as the buildings are to be of a monumental character. They have thought it right, therefore, to refer to this, so that your committee may not afterwards be disappointed.

On February 9, 1894, the Secretary again writes:—I am directed to remind you that I have not yet been favoured with a reply to my letter of December 23 last regarding the above.

In reply the Town Clerk says:—I have yours of yesterday and also received yours of December 23. The Council have decided to adhere to the conditions of the competition. An architectural adviser, however, will be appointed.

THE RUSKIN MUSEUM, SHEFFIELD.

DURING late years the collections in the Ruskin Museum, Sheffield, have not received many additions, but it is not to be supposed that suitable works are unwelcome. The curator, Mr. William White, writing on the subject, says:—Although it is unfortunately true that Mr. Ruskin's ill-health during recent years has prevented him from continuing to superintend the guild's operations, and there has been, therefore, a period of partial interregnum until such time as they might be again actively renewed, the trustees of the guild, having been authorised by him to act for him, it should at least be known that the guild is in existence—one of its trustees being Mr. Alderman Baker, who has twice occupied the mayoral chair of Birmingham—and continues to effect the scheme of the museum as fully as its unaided funds now admit of. I may state that Mr. Ruskin has expressed in writing very clearly what he intended to be done in furtherance of his project in connection with the museum, which he by no means proposed to limit in character, in the manner of a private collection: it was to be thoroughly educational in the highest sense of the word.

During the last few years, since the Corporation of Sheffield has liberally undertaken the external maintenance of the museum, more has been possible than formerly, and several drawings of the mosaics of St. Mark's, at Venice, have quite recently been added to the collection, in addition to very many other drawings and objects acquired by gift or purchase. Among the latter may be mentioned two drawings by Signor Alessandri, one of the staff of exceptionally able artists whom Mr. Ruskin trained so highly for the production of such work, namely, a full-size copy of the head of St. Ursula in Carpaccio's famous picture in Venice of *St. Ursula's Dream*, one of the series of paintings about which Mr. Ruskin has written so fully, and the *Stoning of St. Stephen*, after Tintoretto. The latter, a masterly reproduction in transparent water-colour, of such quality as can nowhere else be seen, has only just been procured; and the purchase of other works by this marvellous copyist are still in contemplation, including a further commission that will occupy him for many months to come. In fact, since the alteration in the management in the year 1889, when I was appointed to the charge of the museum, several hundred drawings which had never been seen by the public previously have been delivered, and carefully framed for exhibition here. Some of these were forwarded from Brantwood, London, and elsewhere, the majority having been kept in store or on loan until they could be duly dealt with at the museum; while many other works are still awaiting similar treatment. Several objects have also been lent during this term to the Birmingham School of Art, and also for exhibition at Huddersfield and Liverpool. At the present time, it may be of interest to know, a somewhat voluminous handbook to the art portion of the collection, upon which I have been occupied for a considerable period, and which will form an introduction to the art-teaching of Mr. Ruskin, as illustrated by the examples in the museum gallery, is in the press, and will shortly be issued by Mr. Ruskin's publisher.

Thus it will be seen that the operations of the museum continue to progress in the manner Mr. Ruskin so heartily desired, and that his programme of future work is being adhered to persistently, with the greatest regard to the scope which he has very specifically defined, nothing being admitted of any kind but what he would undoubtedly most thoroughly approve. To save any unnecessary correspondence, it may, therefore, be well

to state that ordinary offers of objects cannot for a moment be entertained by the trustees.

In conclusion, I should not like to omit saying that I most heartily commend all kindred operations that are calculated to carry out the object Mr. Ruskin has in view. Yet I cannot but think that while the agency of the guild and museum which Mr. Ruskin specially established is in active existence, there is no occasion for any independent or subsidiary schemes carried out in a disjointed and unauthorised manner in the name of Mr. Ruskin, and in repudiation of this museum, whose very existence and object is the systematic production and exhibition of works in illustration of what he has so beautifully described and explained. Until now, since Mr. Ruskin has been unable to take an active part in the furtherance of his projected scheme, no fresh appeal has ever been made, either by the trustees of the guild or myself, for any donation whatever for these purposes. But I think it should be known, as apparently it is not, that any contributions, either in the form of an annual subscription or donation or bequest, towards the great purposes which Mr. Ruskin has so freely devoted his life to advancing, will be gladly received by either the trustees or myself on their behalf.

INSTITUTION OF CIVIL ENGINEERS.

At the meeting of this Institution, Mr. Alfred Giles, president, in the chair, a paper was read on "Forging by Hydraulic Pressure," by Mr. R. H. Tweddell, M.Inst.C.E.

The paper commenced by a brief history of the development of the hydraulic forging-press since the year 1846, when the late Sir Charles Fox proposed the attachment of different tools for the working of hot or cold iron to the tables of the Bramah press. The author then formulated the following conditions as necessary to be fulfilled to insure success in hydraulic forging: first, the press must be so proportioned as to insure the utmost rigidity, any movement of the main columns of course interfering with the correctness of the work; secondly, the crane-power must be not only ample but so arranged that weights reaching to 100 tons could be manipulated by unskilled labourers; thirdly, the details of the construction of such parts as the valves and pumping arrangements must be as perfect as possible. These conditions were discussed seriatim, and the author indicated the means by which they were met in the various types of forging-presses now made. Proceeding to particular makes of press the paper gave descriptions of all those at present manufactured in England. This part of the paper concluded with a reference to the 22-cwt. steel ingot exhibited in the 1851 Exhibition by a Sheffield firm, the size of which was then considered quite exceptional; and by quoting Fairbairn's opinion of the value of the steam-hammer in building up large masses of iron for the manufacture of large guns and marine-engine shafts.

The second part of the paper was devoted to a comparison between the hydraulic forging-press and the steam-hammer. Starting with the axiom that noise and waste of energy were convertible terms, the author mentioned the points in which there could be no difference of opinion as to the superiority of the press. Its power was practically all exerted upon the forging and not dissipated in shocks to the framing and foundations; it also occupied much less head-room than a hammer, and consequently travelling-cranes could be used, passing, if necessary, over the press. Further, not only could more work be turned out by a press than by a steam-hammer in a given time, but it could work through a much greater range, for while the effects of a "blow" shortened the life of any of the dies or tools used, it rendered impracticable the employment of numerous dies and moulds which were satisfactory under pressure. The art of forging large masses had made distinct advances since the introduction of hydraulic pressure; for it was formerly impracticable to forge the hollow marine shafts at present used, or to draw out gun-tubes or hoops on the mandril.

It was extremely difficult to draw the line where the tools described ceased to be forging-presses and became stamping- and welding-machines. Here, there was more room for discussion as to the merits of forging-press *v.* steam-hammer, because many interesting questions arose as to the relative effect of a blow or a steady pressure when, for instance, stamping the ironwork used in wheel-making. The author had preferred to confine himself to the hydraulic forging-press proper and to eliminate the mechanical treatment of metals by forging or pressing as a whole. Much thought had been expended in trying to calculate the size of hydraulic press that would be equal to a steam-hammer exerting a given force of blow, but in the opinion of the author the question was not worth pursuing, because until the amount of work done on the forging was equal and done in the same space of time no satisfactory comparison could be made. Owing to the action of the hydraulic press being constantly progressive the tool continued to free its way into the ingot until its resistance to alteration of form was equal to the pressure on the ram, or the

latter was removed. In this it differed entirely from the action of a hammer which, having delivered one blow, did no more work until the following one. This constituted the essential difference between the two machines. The effect of the hammer was momentary, and there was not time for the pressure it gave to penetrate the metal, much less to alter its form to any extent at one blow, but in the hydraulic press the same rate of working per hour could be maintained, while the material was allowed every opportunity to flow in the required direction without injury. The effect of hydraulic pressure on forgings was to increase their homogeneity. The blow of a steam-hammer was given with least effect when it was most required, that was, it could not get its full stroke until the forging was reduced in size, whereas the press gave its full power at any point in its stroke.

The paper was accompanied by an appendix giving a detailed account of each of the forms of forging-press alluded to in the text; by a note by Mr. Charles Davy, of Sheffield, comparing a press and a hammer doing nearly equivalent work; and by an account of some experiments by Mr. Coleman Sellers, of Philadelphia, on the number of hammer-blows and the amount of hydraulic pressure required to deform similar test-pieces to the same extent.

GENERAL.

Mr. W. E. Ward, of Birmingham, has given his report on the designs submitted for the proposed workhouse buildings at Shaw Heath, Stockport. The first prize of 300*l.* is awarded to Messrs. Booth & Chadwick, Oxford Street, Manchester; the second of 100*l.* to Messrs. Mangnall & Littlewoods, Brown Street, Manchester; and the third of 50*l.* to Messrs. J. Morris & Son, Bolton.

The Scottish Society of Water-Colour Painters have, out of sixteen candidates, elected the following artists as members:—Messrs. W. F. Brown, Frederick G. Richardson, A. C. Holms and Walter M'Adam. At the same meeting Messrs. John Smart, Wellwood Rattray and Duncan Mackellar were appointed hangers for the next exhibition.

Mr. David Burnett, of 14 Nicholas Lane, E.C., has been elected a director of the British Land Company, Limited.

Mr. James A. Cook will read a paper entitled "Three Years' Architectural Life in America" at the meeting of the Liverpool Architectural Society, on Monday, the 5th inst.

The Surveyors' Institution will hold a meeting on Monday, the 5th inst., when a paper will be read by Mr. Howard Martin on "The Report of the Local Government and Taxation Committee of the London County Council on the Subject of the Rating of Ground Values."

Miss Marion Brocklehurst, of the Bagstones, near Leek, has offered to build a museum in the public park for the town of Macclesfield, at a cost of 500*l.*, and to endow it with 50*l.* a year for expenses and 50*l.* a year for a lodge porter.

The Bradford Arcadian Art Club opened their ninth annual exhibition by a private view on Saturday last.

Lord Downshire has presented the committee of the Newry Intermediate School with a site for a new school, for 900 years, at the nominal sum of one penny per annum. The erection of the school is therefore no longer problematical.

An International Exhibition will be opened at Lyons on April 26, and will be closed on November 1.

The Building Act Committee of the County Council propose that Mr. W. H. Stevens should be appointed, temporarily, district surveyor for the district of St. Pancras North and the detached portion of Clerkenwell.

An Art Gallery is to be provided for Reading, at the cost of the Palmer family. The late Mr. W. J. Palmer, in his will, left pictures valued at 1,000*l.* to form the nucleus of a collection.

Mr. Harold Baker read a paper on "Notes in the Avon Valley from Pershore to Tewkesbury" at the meeting of the Archaeological Section of the Midland Institute last evening. Mr. Howard S. Pearson presided over a large attendance. The lecturer described the scenery on the Avon between Pershore and Tewkesbury, and in an interesting manner sketched the histories of the old abbeys in those times, and also of the ancient village churches *en route*.

Professor Powel, of University College, Cardiff, at the meeting of the Cardiff Cymmrodorion, gave an address on the "Castles of Wales." He proved that there were castles in Wales prior to the Norman period, in which the princes lived, but that they were different in construction to the castles the ruins of which could be seen at the present time. He showed also that these latter ones were not Welsh, but built and kept at a great cost to keep the Welsh nation under control.

Sir George Hayter Chubb has accepted the invitation to serve on the joint committee formed by the Lord Mayor and the London Chamber of Commerce in connection with the forthcoming Antwerp Exhibition.

The Architect.

THE WEEK.

AMONG the necessities which are incumbent on the wealthy in our time is the possession of a castle or house, or at least a shooting-lodge (which elsewhere would be considered a large house), in the North of Scotland. In the erection of buildings of that class there was no architect who was more sought after than ANDREW HEITON, of Perth, who died on Saturday last. If he were less able he would still be successful by his manner. He was so frank, genial and good-humoured, so manly and unaffected, it is no wonder so many gentlemen confided their interests to his charge. After a few minutes' conversation with him it was felt that he would be manly and honourable in all transactions. Shrewd Englishmen who made fun of the solemn but absurd posing of the crowd of applicants for a commission, treated ANDREW HEITON as a friend, and were zealous to advance his interests. The large number of his country houses is the best evidence of the respect in which he was held by the most fastidious class of clients. His success did not spoil him, nor make him supercilious and vain. Extensive as was his acquaintance with northern archæology, he was never pedantic, and it must be said that as an architect he could not be charged with undervaluing the buildings of his contemporaries. It is thirty years since Mr. HEITON succeeded his father as city architect in Perth, and he had no ambition to seek his fortune in larger places. His reputation soon extended beyond its boundaries. The HEITONS were an old Border family, and ANDREW HEITON inherited the peel tower of Darnick, between Abbotsford and Melrose, which was filled with "a fouth o' auld nick-nackets, rusty airn caps and jinglin jackets," as well as with other treasures of a peaceful sort. He prized the old tower above any of the buildings he designed, and he was never happier than when he could hold forth with earnestness and humour about its contents with a few friends. It was to Darnick he returned to die. In his business he is succeeded by his nephew, Mr. A. HEITON GRANGER.

No less than eighty-six sets of designs were sent in for the Darlington Municipal Buildings. The Town Council asked Mr. MACVICAR ANDERSON to act as assessor. By his award the design marked "Ad Rem" was placed first, "Practical" second and "Santa Claus" third. Accordingly Messrs. CLARK & MOSCROP, of Darlington, have obtained the prize of 150*l.*; Mr. H. A. CHEERS, of Twickenham, jointly with Messrs. JAMES ASPINALL & JOSEPH SMITH, of Blackburn, 100*l.*; and Mr. G. G. HOSKINS, of Darlington, the prize of 50*l.* The estimated cost of carrying out the successful design is 27,652*l.* The assessor, in his report, wrote:—"The selected designs display considerable ability. The plan of 'Ad Rem,' in particular, I regard as exceptionally compact and convenient, both as regards the municipal buildings and the public hall, while the wide space on the west side of the building, and the purpose to which it is allocated, appear to me excellent features. The architectural treatment both of the exterior and interior deserve high commendation. So far, indeed, as ability is concerned, no doubt or hesitation need be felt in entrusting the execution of the project to the author of this admirable design."

ON Wednesday the proposal to establish a school of architecture and applied art came before the Liverpool City Council. The committee had recommended that the sum of 1,000*l.* a year for an experimental period of five years should be contributed by the Council. The Town Clerk said that the Council could not enter into an engagement of the kind, as it would be anticipating income, and he advised that the proposal should be amended in order to correspond with the obligations of the Council, a course that was adopted. There was very little opposition. One member said it would be better to expend the money on libraries and other institutions for the working classes, for those people who were desirous to bring up their sons as architects had no right to come to the Council to provide the ways and means. But as there was no division it may be

considered that the scheme was adopted with unanimity. At the same meeting it was decided that designs for the new baths at St. George's Pierhead should be obtained by competition, although arrangements had been already made for the preparation of plans by the city surveyor. The outlay will be about 50,000*l.*

THE City Square in Leeds could be converted into an attractive area, but probably there is apprehension that in a city where there are so many mean houses it is not wise to rise beyond the average dead level in any place. The Council having decided to make alterations in City Square, the local architects, with the support of some amateurs, have sent a remonstrance about the proposal. In a memorial they say:—"We view with regret the decision of the City Council on the 7th ult. to commence the laying-out of the City Square by the erection of a public latrine and the removal of the PEEL statue to the centre of the square. We think that to commence any work in connection with the laying out of the Square—which has opened out artistic possibilities the Council have seldom had, and which, with judgment, might be made an object of beauty in the city—before any definite scheme or plan has been considered, would, in our opinion, ultimately lead to failure. We therefore suggest, having regard to the importance of the work, that the Council should place the matter in the hands of a man of acknowledged artistic talent, or obtain a variety of ideas by instituting a public competition." On Wednesday a deputation of the memorialists appeared at the meeting of the Leeds County Council. Mr. BULMER explained the proposals. Subsequently it was proposed to advertise for plans for laying out the Square and to award a premium of 20*l.* for the best. It was considered, however, that it would be premature to decide on any course of action until the new Post Office was completed.

WE lately referred to a lecture which Mr. R. J. BENNETT delivered in Glasgow descriptive of the builders' exchanges which are now to be found in the principal cities of the United States, and are recognised as an indispensable convenience. It is now proposed to establish a similar institution in Glasgow, where all who have to co-operate, directly or indirectly, in the erection of buildings can congregate for the promotion of business. After hearing Mr. BENNETT explain once more the advantages of exchanges, it was arranged to form a committee composed of representatives of the local architects, measurers, masons, brickmakers, wrights, plasterers, plumbers, painters, slaters, cabinet-makers, glass merchants, ironmongers, bellhangers and gasfitters, marble-cutters and tile-layers, to undertake the preliminary arrangements for founding a builders' exchange in Glasgow.

THE admiration of COLERIDGE and CHARLES LAMB has not made the works of DRAYTON familiar to modern readers; but archæologists can find many things of great interest in his pages. DRAYTON's references to Essex were lately explained in an interesting paper read at the annual meeting of the Essex Archæological Society. It was explained how the poet talked of "Choice Chelmer" coming along, "while Dunmow glided down to Chelmsford." The poet then journeyed to the Blackwater, to which he devoted some lines, and then passed on to the river Colne—"the Colne which lends fair Colchester a name," speaking of its oysters, and, what to us sounded strangely, the "cheese which our fat soil from every quarter sends." The poet also referred to the finding of old coins and weapons at Colchester, and then finished his journey at Harwich. There were one or two points in the poet's Essex song worthy of note; surprise was expressed by the two foresters that the forests of Waltham and Hatfield were not felled, a fate which was befalling so many others. It was a curious thing that those two forests were the only two now remaining in the county. In the songs there was striking evidence of the prosperity of the county at the commencement of the seventeenth century, it being declared that Essex was blessed with "every kind of good that in the isle is found." Essex was not the only county which DRAYTON had traversed, and we recommend his works to provincial essayists who are in want of a subject.

MOSAICS.

A GREAT many excellent musicians, if they possessed power, would make it a penal act to manufacture or to use a piano. They say that, from the construction of the instrument, it is impossible to have that "linked sweetness long drawn out" which is an essential in music. A composer can, it is true, write pieces which will suit the little tapping and vibrating so as to enable a performer to deceive his hearers, but BEETHOVEN himself could not enable a pianist to express the melody that is easy with wind and stringed instruments. For a similar reason mosaic must always remain inferior to painting. However laborious may be the operations, it is impossible to produce a curved line by that medium. There may be an infinitude of infinitesimal lines put together to make a line which at more or less distance will appear to be curved, but after all the result will hold a relation to what an able painter can do by a stroke of his hand that is not unlike a surveyor's triangulation in relation to a bit of picturesque scenery. At one time "Berlin wool pictures" were much admired in English houses. As soon as a little information about the principles of art became common they were scorned, for it was then perceived that the mechanical imitation of a pattern made up of squares was evidence of meekness, patience and industry, rather than ability in drawing or colouring. If we imagine the squares to be filled with a coloured composition instead of woollen thread, we should then have a piece of mosaic. Ages before GIOTTO made his O and HOGARTH drew with his graver a reversed curve on a piece of copper, men felt that without curves there cannot be art, and until men become more approximated to machines than they are at present, the old-fashioned notion must be respected. The right line is not only the shortest distance between two points; it is, too, an excellent symbol of uprightness, equity, justice and countless virtues; in architecture, moreover, it should be supreme, but the painter or the sculptor would not suffer if he were deprived of the power to draw one.

Unfortunately the examples of the painter's art cannot endure, and as instinctively men wish to overcome their conqueror Time in some way, we might suppose that at a very early age pictures made up of coloured minerals came into use. If, however, we believe with SEMPER that mural decoration of all sorts is derived from tapestry, and that the use of pottery on the surface of walls preceded the manufacture of burnt bricks, it is safe to conclude that many kinds of decoration were likely to have preceded the use of mosaic in buildings. According to DE LABORDE, mosaic was received from the ancients by the Middle Ages as a modest sort of pavement; it was made to ascend the walls, and then it invaded all architecture, but that statement is only partially exact. That mosaic was originally applied mainly to floors would appear from the reference in the Book of Esther to the pavement in the palace of AHASUERUS, which was "of red, and blue, and white, and black marble." The legend about the whole of the "Iliad" being represented on the deck of a boat belonging to HIERO OF SYRACUSE suggests that when figure-work was copied mosaic continued to be applied horizontally. The Romans could hardly exist in a house that did not possess a mosaic pavement. When they seized a country they began to lay them down, and mosaic pavements were, it is said, to be seen in tents during campaigns. Why so much importance was given to that class of work is inexplicable. But the affection for mosaic caused the artists to make the pavements more elaborate, and intricate paintings were reproduced without any regard for the law of fitness. In some cases satisfaction was supposed to be offered for the breach of æsthetic laws by introducing bordering made up of representations of the usual *débris* of a dinner.

If considered as the adornment of a pavement, intricate battle-pieces and figures of gods and goddesses were out of place. Archæologists have, however, reason to regret that in spite of its shortcomings mosaic was not utilised more often for the preservation of copies of works by Greek painters. It may be doubted whether the process was ever so employed. Some of the examples derived from Pompeii have been fondly supposed to be taken from renowned paintings, but as the names of the artists whose works were copied are never recorded, it is no

less likely that the mosaic was derived from special designs. Mosaic copies would have enabled all ages to decide about the value of Greek paintings—a question that must be left to conjecture.

In what age mosaics were first applied vertically is unknown. Probably the experiment began with the adornment of columns and pilasters. The effect would be sure to please Roman eyes; but strange to say figure subjects were supposed to be more suitable for floors than for walls. In the second century of our era figures in mosaic were employed to decorate vaulting, and possibly at an earlier period. After Christianity had ceased to be proscribed mosaic decoration assumed a new importance. The work was mechanical, and therefore many of the humbler classes could co-operate in the production of medallions, ornamentation and simple figure pieces. The examples which have survived from the fourth century are not of higher value than the paintings in the catacombs. The rise of Byzantium created a new and more profitable field for the mosaicists, as CONSTANTINE and his successors went beyond the pagan Romans in admiration for the work. The artists must have enjoyed a long period of prosperity.

After continuous application they could hardly fail to evolve some sort of theory about the strength and weakness of their art. The examples at Ravenna and elsewhere reveal that the art was better fitted to represent architectural works—more or less imaginary—richly embroidered vestments and robes, tapestry, utensils, &c. The gloom of some of the buildings has made many of the faces assume a sort of impressiveness, but in the majority of cases they are conventional and lack expression. Let any one compare the treatment of the heads and of the garments of the courtiers in St. Vital, and it will be plain that the mosaicists were glad to labour over the elaboration of the embroidery, because with work of that kind they were not entering into a sort of competition with painters, in which defeat was inevitable, for in mosaic it was as impracticable to express a large expanse of one colour as to form a curve. This difficulty has been admitted by the designers for mosaic who have given attention to the subject. Artists of that class are able to perceive that it is not enough to give a sketch that would serve to be executed in oils. The lines and colouring must be adapted to the less pliant material. TITIAN, who could hardly be considered as qualified for such work, sometimes has been happy, especially when he abandoned his ordinary methods of representation. In his standing figure of St. MARK in the Venetian basilica he gets over the difficulty offered by a chasuble of the fifteenth-century fashion by representing it as hanging very loosely on the figure, in order to have several folds instead of stiffness, and by breaking up the surface as if it were covered by an indefinite pattern. As the head is thrown back on looking upwards, and the Saint has a short and thick beard, the weakness of mosaic contours becomes less manifest. In other compositions TITIAN was less subservient to the conditions of the work, but we must remember that in his day it was believed that a piece of mosaic was most successful when it became a counterfeit presentment of an oil-painting, or, as VASARI believed, of a miniature. Fortunately a different theory is now adopted, which was expressed by THÉOPHILE GAUTIER when, in discussing the merits of the early and later mosaics in St. Mark's, he said:—"In mosaic as well as in glass-painting the imitation of nature should be avoided. A mosaic may be called an opaque glass-painting, and the latter a transparent mosaic; the palette of the mosaicist is made up of stones, that of the glass-painter of jewels. Neither of them should seek after reality."

In the great work which Mr. W. B. RICHMOND has commenced at St. Paul's, it is satisfactory to find that he has resolutely avoided the treatment which would be most satisfactory to the majority of sightseers. But as he has succeeded in educating Messrs. POWELL and the men who were entrusted with the realisation of his designs, it is to be hoped that he will be no less fortunate with the English and American pleasure-seekers who will visit St. Paul's in order to criticise the new decoration. For in preparing his drawings Mr. RICHMOND says:—"I had determined to set my face against the modern system of pictorial mosaic; to endeavour as far as in me lay to develop instead the severe style of the earlier mosaic

workers that Italy produced from the sixth to the ninth century, and upon this severe foundation to build up a system of decoration which should belong to the wider, though shallower, perceptions of the modern mind." It may be objected that the style that was suitable a thousand years ago is out of place in an eighteenth-century building. There is no doubt that WREN would have considered the grandiose style of LEBRUN as more in keeping with his building than the severities of the early mosaic workers. Indeed, it is fortunate that WREN was not able to decorate his cathedral, for his powers in that way were not extraordinary. But it does not follow that a severe style of mosaic necessarily means the production of figures which offend against anatomy and physiology. There is no reason why the theological virtues should become more inspiring if they appear as awkward women enveloped in big blankets. Severity is a relative term, and when applied to the new mosaics at St. Paul's it may be taken as suggesting that they are not in the style which prevails in the pictures that are most admired in the summer exhibitions of the Royal Academy.

Let us take colour in the first place. GOETHE, who was industrious in collecting information about "Farbenlehre" and "Farbenbehandlung," calculated that the Italian mosaicists of his day employed variations of colour that are startling from their number. Mr. RICHMOND on the contrary considered that his end would be attained by the use of thirty varieties, and after gaining experience he found that "four whites, three reds, two blues, three greens, three browns, two cool and two warm greys, a strong black and three flesh colours" formed an adequate stock. The limitation in tints insures the desirable non-pictorial quality for a mosaic. Few as were the colours, Mr. RICHMOND acknowledges that he did not foresee their power for disappointment. He had made his outlines rather thin and used brown for them instead of black. The result deserves to be added to those contrasts recorded by CHEVREUIL and OWEN JONES :—

Pure white I found to spread excessively, dark blue to tell as black, amber colour to become quite unreasonably dark, pale cool pinks even greyed very much at a distance and required to be outlined with a strong red to give their value. Both warm and cool greys can be altered as to their appearance very markedly by the colour of the outline by which they are surrounded. Outlined with blue, the whole mass by which the outline is surrounded appears to be influenced in a very distinct manner by its environment; so also does the same method hold good when the outline is red. Blue round white, instead of warming the white, turns it into a faint and rather dead blue colour, whereas, outlined with red, the white appears pink. Strong yellow-greens tell extremely well, but they must be outlined with a thick line of red or burnt sienna-brown to give them their proper value. White lines in light green are very disastrous. Either a toned grey or dull yellow breaks the green best. A black outline to blue is only necessary to divide the blue from gold, or to draw the folds of the drapery where the lights of the blue are brightened with gold; the black outlining seems to preserve the integrity of the blue, whereas a red outline turns the blue into purple. A dark outline of blue or green gives a very mysterious effect, but in that case the blue must be a very clear one and of a middle tint quality, otherwise the blue will tend to make the green appear muddy.

It is creditable to an artist when he puts his own work under the microscope and does not hesitate to face the shortcomings. Mr. RICHMOND increased when necessary the width of his outlines, using tesserae of a better black, introduced white lines among the light colours, substituted dull for bright gold, and so on. The effect of the change was satisfactory. Silver was a disappointment; burnished gold was avoided in the background, and the artist claims a success for what he used. In one of the lately-executed mosaics in Paris the gold background had to be painted over with white in parts, in order to diminish the vulgar glare. Mr. RICHMOND ascribes the failure in similar cases to the tesserae being fixed too closely and to the use of only one quality of gold. "One need never be afraid," he says, "of letting the ground show the sixteenth or even a quarter of an inch around each cube." The belief that a mosaic should correspond with an oil-painting in treatment is established among workmen, and their ambition is to form a surface that will not reveal the number of tesserae employed, and to accomplish that end they try to make the joints almost invisible. Mr. RICHMOND tells us of the difficulty he found in persuading his men that "the worst mosaic is most like a picture, and the best mosaic has all the structural qualities belonging to architecture; the one

entirely out of place in a building, while the other seems to grow naturally out of architectural forms."

The concealment of the joints of the tesserae was not the only defect which Mr. RICHMOND has endeavoured to amend. He has gone back to the old method of fixing tesserae directly on the wall instead of laying them down on paper, which is the usual way. Whether the reform can become general may be doubted, for a mosaicist has to suit the convenience of others, and on that account he must endeavour to do as much of his work as he can in his own workshops. In St. Paul's Cathedral all things were arranged to give Mr. RICHMOND facilities for his experiments, but in most buildings supremacy cannot be yielded to the decorator, or, in fact, to anyone among those who co-operate. We are afraid therefore that Mr. RICHMOND's boast about having killed paper mosaic for ever in England will not stand the test of time like his panels.

In whatever way the tesserae are set, much depends on the nature of the cement. MUZIANO, of Brescia, who was long engaged on the mosaics of St. Peter's in Rome during the sixteenth century, claimed to be the first who used oil in his cement, of which the other constituents were powdered travertine and lime made from it. Water cements were used at an earlier time, and sometimes wax was an ingredient. After several experiments, Mr. RICHMOND found that "linseed oil, wax, lime and gold size, held together by finely powdered marble dust, made a very firm-setting cement, which maintained a sufficient elasticity to prevent expansion, and the consequent dropping out of the cubes at a not very distant date. This cement does not dry with any rapidity; it remains in sufficiently malleable condition for a day's work."

The description of the mosaics by the Rev. Canon BROWNE, which is printed on another page, will suggest the subjects and treatment more clearly than could well be done by a layman. The opportunity which was given for an examination of the work on Saturday has enabled us to bear testimony to the conscientious spirit in which every inch of the decoration has been executed. But mosaic should never be judged from any point of view except the one that was contemplated by the artist. After Easter, when the scaffolding has been cleared away, it will be time enough to judge of the effect of Mr. RICHMOND's work. Those who expect something scenic, and anticipate that the resplendence of colour and sparkle of the golden tesserae will symbolise the wealth and power of the City, are likely to be disappointed. Colour-work too often keeps the word of promise to the ear rather than to the eye, and the partial experiments in St. Paul's never realised all that was expected from them. So little is known about colour in this country as applied to buildings, it is perhaps excusable for people to imagine that what they see on the stage could be easily surpassed to a degree that is incalculable with the proper materials. It is forgotten that owing to the difficulty of attaining success there is, as FERGUSSON says, "hardly one single instance known of a complete polychromatic design being successfully carried out anywhere, though often attempted." In a building of the size of St. Paul's it is unreasonable to suppose that a transformation can be accomplished by filling up a spandrel with colour, or even by expending 12,000*l.* on the east end. If the last experiment can be deemed to have attained sufficient success to warrant a large experiment on other parts of the building, the designer and workmen will have gained a victory.

THE ABBEYS AND CATHEDRALS OF SCOTLAND.

AT the meeting of the architectural section of the Glasgow Philosophical Society, Mr. P. M'Gregor Chalmers, architect, delivered a lecture on "The Abbeys and Cathedrals of Scotland." He said :—There is only one reliable guide in the study of the history of the ecclesiastical architecture of Scotland. Local tradition is often interesting, but as a fabric reared by memory and imagination it can aid us but little where scientific accuracy is desired. It might be thought that in the mass of literature on the subject published since Scott revived the dying interest of Scotsmen in the beauty of their own country and in its history, there would be found all the material necessary for the history of our old abbeys and cathedrals. But a somewhat extensive acquaintance with that literature

convincing one that in very few instances is the printed page more than a record of local traditions. The writers generally have been men of culture, but with very few exceptions they have had no knowledge of art. They stumble and fall at every turning. We find no parallel to this in the modern literature of science, and yet art is as practical as science. When we turn to ancient charters and documents we may be readily lulled into the belief that we have at last found a sure foundation. But many a wreck can be traced to trust in a defective compass, and the written page of long ago has been a most prolific source of error. A charter runs that King David I. founded the abbey of Melrose. The charter is true. But shall we see King David's work, as we are sometimes told, when we visit the beautiful shrine to-day; and shall we gaze on his statue and that of his queen as they sit perched on their throne in the apex of the east gable? King David's work has long since passed away, and the statues are those of later monarchs. The charter cannot aid us here. But we shall find a better illustration nearer home, in our own cathedral of Glasgow. One of the most interesting chapters in the history of the building relates to the tower. Nothing that is known of Bishop Robert Wishart is more characteristic than his acceptance of a present of timber from King Edward I. of England, in 1291, to enable him to complete the tower of his cathedral, and his misapplying the gift to the construction of engines with which to batter the English in the castle of Kirkintilloch. The record of a later time is that the tower was destroyed about the year 1400, and that it was rebuilt soon after by Bishop Lauder. The present central tower bears the arms of Lauder. Then we are told that the tower Wishart erected was the central tower, and as a necessary sequel to this the nave is said to have been erected in the thirteenth century. This is the statement accepted at the present moment. But allow the mind to harbour a doubt. The nave completed at the end of the thirteenth century? Then not a single stone was laid for about one hundred and thirty years, although all that remained to complete the great fabric was the comparatively insignificant structure at the north-east corner of the building—the very necessary chapter-house and sacristy. Again, for what purpose was the nave erected? Was it to stand, as it does to-day—a barren wilderness—or was it intended for the worship of the faithful who should gather round its sacred altars? Surely it was built for some useful purpose; and yet we are asked to believe that it stood empty for more than one hundred years, as there is no record of the dedication of any altars until the beginning of the fifteenth century. What, then, was this thirteenth-century tower? In a study of this point made some time ago, which will shortly be published, it was conclusively proved that the tower erected by Wishart and restored by Lauder was the north-western tower, so foolishly removed sixty years ago. The nave is fourteenth-century work. A charter of itself is but a poor guide, therefore. It was a favourite practice in the olden time for the local magnate or the chief prelate to have his name or arms carved on the building erected or restored by him, and thus to preserve the record of his act of generosity. In many cases these records in stone supply us with the most definite information regarding the age of the work. Frequently they are the only source from which we draw that human interest which gives vitality to our study. But can it always be said that he who runs may read? Turn to Glasgow Cathedral again—to the remarkable aisle of Car Fergus—the lower storey of a never-completed south transept. This is popularly known as Blackader's Crypt, and that archbishop's arms will be found on two buttresses on the exterior, and on the groined roof in the interior. Of this building it has recently been written, "Anyone unfamiliar with the later Scotch styles, and who did not know that this crypt was erected by Bishop Blackader in the sixteenth century, would be very much puzzled by this building. It is as unlike English work of the same period as can well be imagined. At first sight, looking at the outside of it, one would say that it was Early English. The builders seem to have done their best to copy from the adjoining crypt; the plan of the window joints is very much the same, and even the mouldings, but I have never seen an instance where a late workman has managed to make an early capital or base. The late work is sure to be detected there, if nowhere else; and here, as both can be seen from the same spot, it is interesting to compare the one with the other." Let this statement be subjected to the criticism it richly merits. We are asked to believe that the artist, working about the year 1500, in order to secure some appearance of uniformity, deliberately copied not only the general design, but also the very delicate mouldings of his predecessors' work of 250 years before, in walls and piers which are comparatively obscure, but that, when he came to the more prominent and attractive carving and the great vaulted roof which bulks so largely in the eye he relapsed into the style of his own day. Nor can it be omitted that at the very moment when this desire for uniformity is supposed to have existed the

rood-screen, standing in the very centre of the great church, and the observed of all observers, was erected in a style true to its own period, and utterly unlike its surroundings. That there was imitation of early forms for the sake of unity of design in this case or in any case in Scotland cannot be maintained. Had there been a more careful examination the difference referred to in the mouldings of capital or base would have been seen to be non-existent, and it would have been recognised that the resemblance of this building to thirteenth-century work was due to the fact that it is thirteenth-century work. To maintain otherwise would compel us to assert that the supposed copyist stamped almost every stone of walls and piers with the masons' marks of the thirteenth century, and that when he came to the carving and the groined roof and to the rood-screen he omitted them altogether, and in this was again true to his peculiar habit. The arms of Archbishop Blackader are not a record of building, but only of restoration. From this illustration it will be seen that the presence of name or arms is not an infallible guide to us in our study. That infallible guide we must secure in the art itself. In whatever field of study we may search, in the history of literature, of science or of art, we shall always find that every work to the production of which man has devoted the best of mind and hand is indelibly stamped with the impress of his own individuality and of his time. The distance that separates a Caedmon or Alfred from a Swinburne or Henley may be bridged, and each arch stone will be a poem. So it is with architecture. The Christian architecture of the Romans, as first introduced into Britain, was far removed from, and had little in common with, the delicate Gothic work of the end of the fifteenth century, and yet the progress from the one to the other was certain and steady. Only by the aid of the art itself in all its minute changes can we hope to travel the road that lies over these 1,200 years. Mr. Chalmers afterwards exhibited a series of views covering the country from Kirkwall to Durham, and from St. Andrews to Iona, and arranged in chronological order. Beginning with the best authenticated site of St. Ninian's "White House" at Whithorn, the early MSS. and crosses, the progress of the art was shown from the church of St. Regulus at St. Andrews of the middle of the eleventh century; through the twelfth century as in Durham, Dunfermline and Jedburgh; the thirteenth century as in Glasgow; the fourteenth century as in Melrose; the fifteenth as in Linlithgow, Roslin and Lincluden, until he came to the work of the early sixteenth century, as in Paisley, when the art was engulphed in the convulsive Reformation.

A SCHOOL OF ARCHITECTURE AND APPLIED ART.

THE following scheme has been prepared by the special sub-committee appointed to consider and report upon the proposed Public School of Art, Architecture and Applied Arts for Liverpool.

A permanent board of art, architecture and applied arts to be constituted, in which the City Council shall have a considerable representation, and be associated with representatives of educational institutions or societies taking part in the scheme. The constitution of the board to be as follows:—The lord mayor, the chairman of the library, museum, and arts and technical instruction committee, the chairman of the arts and exhibition sub-committee, the chairman of the technical instruction sub-committee, two other representatives nominated by the City Council, the principal and one representative of the senate of University College, two representatives of the Council of University College, the president and one representative of the Liverpool Architectural Society, one representative of the Liverpool Academy of Fine Arts, one representative of the Liverpool Master Builders' Association, one representative of the Building Trades Federation and the professor of architecture—sixteen members in all.

The board to be responsible for the educational and financial organisation and administration of the school, and in particular to (1) conduct the Central School of Art in Mount Street, which shall include an efficient life school; (2) establish branch schools of art (up to three in number) in suitable localities, if and when such schools are found necessary; (3) establish a studio for modelling and sculpture; (4) arrange for courses of instruction in architecture at University College; (5) make provision for instruction in (a) carving in stone, wood and marble; (b) colour and the use of pigments for mural decoration and glass-painting; (c) plaster-work; (d) metal-work, and also, if thought desirable, to establish classes in other industrial arts, such as pottery, goldsmiths and silversmiths' work, book-binding, typography, engraving and etching, and lithography.

Acting subject to the direction and decisions of the board, the professor of architecture to be ultimately the director of the proposed school; but, until he shall have organised and put into working order the courses for architecture, sculpture and the applied arts, the head master of the School of Art in Mount

Street to continue to be the head thereof, and responsible directly to the board for the education given in the school. During the period just referred to the professor of architecture to have full access to the School of Art, and any recommendation from him as to the courses of study to be pursued by students in architecture, sculpture or the applied arts to be carried out by the head master of the School of Art. The expenditure involved in carrying out such a scheme is estimated at 1,000*l.* per annum, independently of the revenue derived from fees, capitation grants from the Science and Art Department and the City Council, and from the University College Art Chair endowment fund. It would be necessary that such an amount should be allocated to the board by the technical instruction sub-committee from the funds at their disposal. That this scheme be adopted for an experimental period of five years, upon the understanding that any change in the constitution shall require the approval of the City Council on the recommendation of the board.

The report also states that University College is prepared to associate the Roscoe Professorship of Art with a central scheme of art instruction in the city, and would allot to it the income from the endowments of the chair. They would further provide suitable accommodation for the professor of architecture and his classes. Also, the directors of the Liverpool Institute are prepared to hand over to the proposed board for a nominal consideration, and for an experimental period of five years from January 1, 1894, the present Liverpool School of Art, Mount Street, on the understanding that the work of the present school will be fully maintained during that period, and that the existing grants from the City Council are continued.

MEMORIES OF OLD LONDON.

A LECTURE on the "Old Traditions and Memories of our Own Neighbourhood" was delivered before a numerous audience at the London Institution, on the 1st inst., by the Rev. Canon Benham. Confining his sketch to portions of London in the neighbourhood of the Bank, Royal Exchange, Broad Street, Coleman Street, City Road, Bunhill Row and Moorfields, the lecturer, says the *Standard*, contrasted the present condition of this part of the Metropolis with what it was several centuries ago, and by the aid of maps of old and new London showed how the courses of many of the streets had been changed, how old churches and other buildings had been removed and modern structures erected upon their sites, and how the fields which used to surround the City had been gradually absorbed as the suburban extensions had progressed. He stated that one hundred years ago there were large gardens in the immediate neighbourhood of the Bank. At this time neither Moorgate Street nor Gresham Street existed, although what is now known as Gresham Street was then called Cateaton Street. This change of name was said by Albert Smith—although the story was a pure invention—to have been brought about at the instigation of a maker and vendor of sausages and meat pies, whose business was carried on at Cateaton Street, and who, not liking the manner in which the City wits associated his wares with the name of the thoroughfare in which they were sold, got elected to the Common Council, and induced that body to re-christen the street, whereupon, added the scribe, "his business increased amazingly." Near Bartholomew Lane stood a church, which was removed in 1841, and rebuilt in Moorfields. The lecturer remembered the burning of the old Royal Exchange, and the rude way in which the fire was pictured in the newspapers of the day. The present building covered more space than the one it had superseded, and on the open ground in front of it formerly stood two blocks of buildings. On part of the site of the present Exchange stood the little church of St. Benetfink or Benetfinch, the last syllable denoting the name of the donor, who was still commemorated by Finch Lane. In this church Richard Baxter was married, and Cardinal Newman was born close by, in Finch Lane. The church was pulled down in 1844. Another church, called St. Christopher-le-Stocks, stood in the neighbourhood, its second appellation being derived from the stocks, for the correction of offenders, which stood in the vicinity. This edifice was built in the thirteenth century, was damaged by the Great Fire of London, and restored in the Wren style, grafted on the Gothic remains. At the time of the Gordon riots, owing to the fears then entertained that the low tower of the building might be used by a mob desirous of storming the Bank, the church was removed, under the provisions of a special Act of Parliament, and its site absorbed in that of the Bank. Coleman Street, whose courts and alleys still retained their ancient names, was so called because of the coal-men or charcoal burners who had settled there in the thirteenth century; but later on, in the sixteenth and seventeenth centuries, Coleman Street became one of the most fashionable parts of the City, and when Charles I. attempted to seize the five members, they were for a time concealed in a gentleman's house in that thoroughfare. Moreover, there was a house in

that street which used to be frequented by Oliver Cromwell. In 1781 Robert Bloomfield, the author of the "Farmer's Boy," lived in Bell Alley, where he learnt to make shoes and wrote his celebrated poem. Part of London Wall stood at the end of Coleman Street, and much of it was intact in the eighteenth century. Indeed, some of the old wall still existed in that neighbourhood, but was hidden by the buildings erected against and upon it. Beyond the wall was the moor, which gave its name to Moorfields. Close by were Cripplegate and Bishopsgate, and beyond all was open as far as Islington. Outside the wall was a foul and noxious ditch to which reference was made by Shakespeare, who made Prince Henry speak of "the melancholy of Moor-ditch," whereon Falstaff replied, "Thou hast the most unsavoury similes." Islington, or Isledon, as it was then called, was a secluded village, and Chelsea was also a village far away from the buildings which then constituted the Metropolis. The moor was often under water, which, when frozen, was resorted to by skaters from the City, who in those days used mutton bones instead of the modern skate-irons. Near Isledon the Londoners went wild-duck shooting, and the Lord Mayors used to hunt in the district, their dog-kennel occupying the site of Finsbury Pavement, opposite South Place. In 1415, the year in which the battle of Agincourt was fought, the Lord Mayor, Thomas Falconer, had the wall broken and a gate built, through which the citizens went upon the moor. A causeway was made to Isledon. To the left stood St. Giles's Church, which was built in the reign of Rufus. It was not to be supposed that the growth of London had always been continuous; on the contrary, owing to the great outbreaks of pestilence which occurred in the fourteenth century, two-thirds of the population of the entire nation were swept away, the terrible "Black Death" of 1349 destroying one-half the people of Europe. The sites of Charterhouse Square and Merchant Taylors' School became the burial ground of 50,000 persons in that year. Then followed cattle murrains and other visitations, during which the air was so tainted by rotten carcasses that the birds died while flying over the pestilential area. In those days the population of Cripplegate consisted mainly of foreigners. With regard to Grub Street, whose change of name to Milton Street was to be regretted on account of its association with that class of literature which had so often been criticised by well-known writers, the thoroughfare was composed of a wretched type of wooden houses, the majority being of only one storey. Fox, the author of the "Book of Martyrs," lived and died in Grub Street; and Daniel Defoe died in Ropemaker Alley, which ran in a zigzag direction out of that thoroughfare. In 1710 something was done in the way of draining the moor, and there was formed what might be termed the first public park or recreation ground for the City of London. Here all kinds of sports and exercises were indulged in, duels with rapiers were frequently fought, and laundresses dried their linen upon the turf. In 1645, after a survey made by Inigo Jones, the Moor Ditch was filled with earth and covered in. Moor Gate was rebuilt in 1673, the gateway being made higher than the other City arches because of the large quantities of hay that were brought to that part of London. In 1761 the gates generally, which had then become useless, were taken down, and the stones were deposited on one side of Old London Bridge to protect the piers from the fierce rushing of the Thames water. In 1549 the Protector, Somerset, ordered that the dead should be removed from their resting-place under the shadow of St. Paul's, and more than one thousand cartloads of their remains were taken to that part of the moor where the City Road met Tabernacle Street. Here, instead of being reburied, they were covered with earth, and the great heap thus formed was called "Bone Hill," whence had originated the name Bunhill Fields. It was here that John Bunyan was interred; he died in Holborn or Snow Hill. There used to be three sets of Moorfields, Lower Moorfields being carefully laid out for recreative purposes. This part of the moor, which formed the site of Finsbury Circus, was the property of the Fynes or Fiennes family, and was given to the City Corporation by its last owners, who were two sisters of that name. It was to have been kept open for public use, but in course of time the land was diverted from that purpose and built upon. At one time snipe-shooting used to take place in what was now St. Martin's-in-the-Fields, and Moorfields was then the accustomed resort of courtiers and people of fashion. It was here that the public used to be diverted by the sight of the thief-whippings which took place at periodical intervals, while stalls were erected on the ground, thimble-rigging flourished, Merry Andrews and jugglers went through their performances, and here and there grave ambassadors might be seen walking with noblemen and other persons of rank and position, discoursing on affairs of State. In 1641 the City Corporation granted to the Artillery Company the lease of the premises they still occupied. At the time of the Plague, Cripplegate suffered more severely than any other part of London. It was, however, untrue to say that Finsbury Circus was the site of the great plague-pit. That was just outside St. Botolph's, Aldgate, and there was a smaller pit at the junction of Old Street and

Goswell Road. It was the lecturer's belief that Defoe was not buried in Bunhill Fields, but in the plague-pit, according to his own wish. John Milton died in Bunhill Row in 1674. References to the Great Fire of London, the establishment of the Bethlehem Hospital, whose inmates at one time were made a show of, and other incidents connected with the history of London were also referred to, and in conclusion the lecturer stated that there was a lady still living in her hundred and first year who could remember Moorfields as far back as 1801, when no buildings existed there.

TESSERÆ.

Justinian as a Builder.

WHATEVER were the views of Justinian, the number of buildings which he erected, even taking into our consideration the resources of a long reign, almost exceed belief. And of these architectural labours it has been too harshly said "that they were cemented with the blood and treasure of his people." His pious munificence was seen in the construction of churches, whilst almost every city in the empire obtained the solid advantages of bridges, hospitals and aqueducts, and he consulted his own ease in the restoration of the palace at Byzantium. There was everywhere a display of magnificence and of the most costly ornaments. But it is in the temple, now the mosque, of St. Sophia, which was originally raised by Constantine, but rebuilt from the foundations by Justinian, that we are to look for all the skill, taste and munificence of the age. It had been twice destroyed by fire, but it was now to rise resplendent on an improved and extended scale. The principal architect was Anthemius, who presided over the imperial works. He formed the design, and it is said that his genius directed the hands of ten thousand workmen. Justinian, clad in a linen tunic, every day surveyed the rapid progress, and six years had not elapsed when he had the happiness to behold its completion and to assist at its solemn consecration. After some years, however, an earthquake overthrew the eastern part of the dome. The perseverance of the same prince again restored its splendour, and in the thirty-sixth year of his reign he celebrated the second dedication of a temple which, after twelve centuries, remains a stately monument of his fame. Of this celebrated structure, of its aerial domes lightly reposing on its arches, its columns of granite, of porphyry and of green marble, its semi-domes, its walls encrusted with marbles, its various members, admirable by their size and beauty, and all embellished by a rich profusion of jaspers, gems and precious metals, it is not necessary to repeat the descriptions which many authors will supply. But though this venerable pile, which could excite the admiration of the Greeks, even now, as shorn by Turkish fanaticism or the corrosion of time of its more perishable ornaments, continues to furnish a rich repast to the curiosity of the traveller, it is generally agreed that a striking deficiency is often perceptible in the combinations and contrasts of parts, and that Anthemius, had he been content to copy the exquisite models which in his time still adorned the cities of Asia Minor and the provinces of Greece, might have produced a work which would at once have been more sublime and beautiful. But for this a refined nicety of taste was necessary, which was no longer to be found.

Early Use of Iron in Europe.

The iron-using people buried their dead in tumuli, sometimes burning the corpse, and at others laying it at full length. Sometimes, as in some of the tombs round Stonehenge, they made use of the tumuli of the Bronze Age, so that after digging through the secondary interment of the one age, you come in the centre of the mound to that over which the mound was originally heaped. That they were, comparatively speaking, highly civilised there can be no doubt. In Gaul Cæsar tells us that they opposed the Roman armies in the field with chariots and cavalry, and fought for a whole day with the Roman fleet off the coast of Brittany. The actual date of the introduction of the use of iron into the area north of the Alps and the Pyrenees cannot be satisfactorily ascertained, but it seems pretty clear that wherever the Romans came in contact with Gauls or Britons or German tribes, they found them armed with weapons of iron. The Scots, according to Tacitus, used chariots and iron swords in the battle of the Grampians—"enormes gladii sine mucrone." The Celts of Gaul are stated by Diodorus Siculus to have used iron-headed spears and coats of mail, and the Gauls who encountered the Roman arms in B.C. 222 were armed with soft iron swords, as well as at the time when Cæsar conquered their country. Sir John Lubbock thinks it probable that the commercial organisation which introduced bronze introduced also iron, and it is very possible that the Phœnician, Etruscan and Greek traders may have brought in the art of reducing iron ore into the region where bronze had been previously used. And if from any cause or

other the tin trade was interrupted, as it certainly must have been by the break-up of the Phœnician and Etruscan power, to say nothing of the wars which must have happened from time to time between the tribes of France and Germany, the people cut off from the supply of tin must either have used copper or have been obliged to apply iron for those purposes to which they had applied bronze. This certainly may be one of the causes of its introduction, but at the same time it must be admitted that the patterns of the Iron Age differ from those of the Bronze, and the weapons are of a different character. Did the Celts, the conquerors of the Iberian race north of the Alps, invade Europe, bringing their iron weapons along with them from the East? The long sword, made for cutting rather than for thrusting, was certainly not derived from Greece or Italy, and it appears for the first time in the West in the hands of the Celts and the Germans. It is by no means improbable that the civilisation of the Iron Age was in part introduced into Europe by the Celtic and Teutonic invaders from Central Asia.

The Courses at Olympia.

The open spaces between the buildings were filled with statues. These were of two kinds, either votive offerings of cities or individuals, erected here as in the most celebrated place of assembly for the whole Hellenic world, or statues of men who had won the victory of the Olympian contests. These statues, which with few exceptions were of bronze, were destroyed by fire at the Gothic invasion; the stone pedestals, with their inscriptions, were overturned, deported and destroyed in Byzantine times, when the temple of Zeus was converted into a fortress; still a few of them remained near their original sites, among them some of those described by Pausanias in his "Itinerary." Hence it is possible for us to make out here and there the original disposition of the statues, and to determine the routes which once traversed this forest of statuary. The main route lay through the pompic (processional) gate on the south; around the altars spaces were left free for the people to assemble. Inside of the wall, on the east side, was a portico 100 metres long, the Echo Hall, the northern end of which faced the last of the row of treasuries; at its southern end it abutted on the Leonidaion, a building erected by one Leonidas for the entertainment of distinguished guests, while the great mass of the people camped in tents around the walls of the Altis. But the ground outside of the Altis was also covered with buildings of all sorts. Eastward lay the Stadium, accessible through the "private" entrance lying between the Echo Hall and the most easterly of the treasuries. This gave admittance to the judges and the contestants at the beginning of the games. It was an arched passage leading to the starting-place for the runners, and the furrowed stones on which the runners took their places are still in place, as also, at the opposite end, the goal. All the other contests were also carried on here, except the horse and chariot races; for these the Hippodrome was intended. It lay to the south of the Stadium, but the overflows of the Alpheios seem to have destroyed all traces of it. To the south stood an edifice which consisted of two aisles lying in an east-and-west direction, with a quadrangular court in the middle. These two aisles were separated by a central line of columns, and were terminated at their western ends by a round niche. This building is nearly contemporary with the temple of Zeus. It is supposed to have served as a meeting-place for the Olympic Council, while the quadrangular space in the middle was, in all probability, the sanctuary of Zeus Horkios, before which the contestants had to make oath that they would strictly observe the laws of the contest. The building is one of the most important remains of State architecture in the fifth century. To the south of the council-house was a hall fronting on the great highway leading up from the Kladeos to the principal entry. Between the Kladeos and the Altis on the west was a series of magnificent buildings.

Greek Myths.

We can scarcely read the legends of Herakles and Demeter, of Theseus, Kadmos, Perseus and a host of other mythical heroes, without feeling that a few simple phrases might well have supplied the germ for the most intricate of these traditions. Every incident in the myth of the Eleusinian Demeter may be accounted for, if only men once said (with the conviction that the things of which they spoke had a conscious life), "The earth mourns for the dead summer. The summer lies shut up in the prison of Hades the unseen," or, as in the language of the Northman, "She sleeps in the land of the Niflungs, the cold mists, guarded by the serpent Fafnir; and the dwarf Andvari keeps watch over her buried treasures." The tale of Endymion seems to speak for itself. "The moon comes to gaze on her beloved, the sun, as he lies down to sleep in the evening." In the story of Niobe we seem to see the sun in his scorching power consuming those who dare to face his dazzling brightness; in that of Orpheus, we seem to hear his lamentation for the beautiful evening which has been sung by the serpent of the night, and which he brings back to life only to lose her at the gates of day. In the myth of Europe we

have the journey of the sun from the far East to the Western land, until Telephassa, the far-shining, sinks down wearied on the Thessalian plain. Still more transparent appear the tales of Kephalos and Daphne. Prokris, even in the mouth of the Greek, is still the child of Herse, the dew; Eos is still the morning; Kephalos still the head of the bright sun. In Daphne we seem to behold the dawn flying from her lover and shrinking before his splendour. In the Homeric Hymn, Leto, the night dark and still as death, promises that Phoibos shall long abide in Delos, the bright land. Doubtless she made the same promise to Lykians, Argives, Arkadians, Athenians and all others who called themselves the children of the light; but the sun cannot tarry, and in spite of her plighted word he hastens onward to slay the serpent of darkness. In Herakles we see the sun in other guise, loving and beloved wherever he goes, seeking to benefit the sons of men, yet sometimes harming them in the exuberance of his boisterous strength. In the tale of Althaia we read the sentence that the bright sun must die when the torch of day is burnt out. In Phaetbon we seem to see the plague of drought which made men say, "Surely another, who cannot guide the horses, is driving the chariot of the sun." The beautiful herds, which the bright and glistening daughters of early morning feed in the pastures of Thrinakid, seem to tell us of the violet-coloured clouds which the dawn spreads over the fields of the blue sky. In Bellerophon, as in Perseus, Theseus, Phoibos and Herakles, we find again the burden laid on the sun, who must toil for others, although the forms of that toil may vary. Perseus goes to the dwelling of the Graiai as men might have said, "The sun has departed to the land of the pale gloaming." When Perseus slays Medousa, the sun has killed the night in its solemn and death-like beauty, while the wild pursuit of the immortal Gorgons seems to be the chase of darkness after the bright sun, who with his golden sandals just escapes their grasp as he soars into the peaceful morning sky, the Hyperborean gardens, which sorrow, strife and death can never enter. In the death of Akrisios we have the old tale which comes up in many another legend, where Oidipous and Theseus mourn that they have unwittingly slain their fathers.

Russian Malachite.

As a substance available for veneering, malachite is found chiefly in a single locality in Russia, in lumps of moderate size rarely so large as a child's head, and is cut for use into thin slices, which are fastened on a copper, iron or marble surface, prepared for the particular use designed. Formerly the slices were with straight edges, and were put together without much reference to the continuity of the natural lines of veining; but, by a very ingenious set of contrivances of modern date, most of the surfaces are now curved, and not only fit into corresponding curves, but the veining is made continuous as in nature, so that extremely simple but elegant patterns are produced, giving an appearance as if the whole of a large surface were of one piece. The effect is greatly heightened by a peculiar cement, made of broken fragments and powder of the malachite itself, imitating accurately a natural breccia frequently occurring in the lumps. The rounded and other surfaces are all cut out of the solid block by saws constructed for this purpose, and the labour incurred in making any large object, together with the enormous amount of waste in the raw material, combined with the original costliness of the stone, render the expense very considerable. The prime cost of fine malachite at St. Petersburg varies from 12s. to 15s. per pound avoirdupois, according to the quality, and at least two pounds are wasted for every pound used.

Time and Works of Art.

A complaint has been made of the short-lived duration of works of art, and particularly of pictures; and poets more especially are apt to lament and to indulge in an elegiac strain over the fragile beauties of the sister art. The complaint is inconsiderate, if not invidious. They will last our time. Nay, they have lasted centuries before us, and will last centuries after us; and even when they are no more, will leave a shadow and a cloud of glory behind them through all time. Lord Bacon exclaims triumphantly, "Have not the poems of Homer lasted five-and-twenty hundred years, and not a syllable of them is lost?" But it might be asked in return, "Have not many of the Greek statues not lasted almost as long, without losing a particle of their splendour or their meaning, while the Iliad (except to a very few) has become almost a dead letter?" Has not the Venus of Medicis had almost as many partisans and admirers as the Helen of the old blind bard? Besides, what has Phidias gained even by the discovery of the Elgin Marbles? Or is not Michel Angelo's the greatest name in modern art, whose works we have scarcely seen except in description and by report? Surely there is something in a name, in wide-spread reputation, in lasting renown, to satisfy the ambition of the mind of man. Who in his works would vie with nature? An epitaph, an everlasting monument in the dim remembrance of ages, is enough below the

skies. Moreover, the sense of final inevitable decay humanises, and gives an affecting character to the triumphs of human art. Imperishable works executed by perishable hands are a sort of insult to our nature, and almost a contradiction in terms. They are ungrateful children and mock the makers. Neither is the noble idea of antiquity legibly made out without the marks of the progress and lapse of time. That which is as good now as ever it was seems a thing of yesterday. Nothing is old to the imagination that does not appear to grow old. Ruins are grander and more venerable than any modern structure can be, or than if they had been kept in the most entire preservation. They convey the perspective of time. So the Elgin Marbles are more impressive from their mouldering imperfect state. They transport us to the Parthenon and old Greece. The Theseus is of the age of Theseus. The Apollo Belvidere is a modern fine gentleman, and we think of this figure only as an ornament to the room where it happens to be placed.

Mosaics.

The name mosaics, as is well known, is given to the coloured imitations of a painted pattern by employing fragments of marble, stones, different coloured enamels, suitably cut, which are united together side by side, and also fastened together by means of a fine mortar or cement. If it were possible to make a mosaic with elements as fine and as compact as the threads of tapestries, the work would appear to occupy a place between an oil-painting and a Gobelin's tapestry; it resembles the latter because it is the result of the juxtaposition of coloured elements of an appreciable size; and it approaches to the nature of a picture by a uniform surface rendered brilliant by means of the polish it has received; besides, the contrast of opaque and vitreous elements resembles that of opaque and glazing colours in oil-painting. But mosaic being made to serve for pavement, or at least to be exposed to the changes of weather, the humidity of ground-floors, &c., resistance to these destructive agents must be its essential quality; on the other hand, the place it generally occupies in edifices does not permit the eye to seize all the details we look for in a picture; we wander from the aim when we pretend to give to works of this nature the finish of painting; we then confound two arts entirely distinct in aim and also in the nature of the coloured elements of which each of them makes use.

Jan Torrentius.

The last of the Dutch painters who came to England, and who, if not patronised by Charles, sold him two or three of his works, was a proof of the degradation of which art is capable. Jan Torrentius was born at Haerlem in 1589, and began by drawing chairs, tables, glasses, vases and scenes of low life, which he executed with sufficient truth and finish to gain a good name and high prices. It was not long, however, before he became imbued with the disgusting doctrines of a society of Adamites and prostituted his pencil to their uses. He had at least, as Walpole says, the merit of practising what he preached. His life was a succession of profligate excesses; and his studio the meeting-house of his licentious confraternity, for whom he produced pictures of the grossest obscenity. To the credit of the authorities of Haerlem, they determined to try him; and as he stoutly denied his connection with the society, he was put to the torture and condemned to an imprisonment of twenty years. From this he was released, as it is said, at the instigation of the English ambassador and escaped to London. Here he resumed his old practices and debauched pencil, but met with little encouragement; and returning to Amsterdam, lived in concealment till he died in 1640.

Phidias as a Sculptor.

The grand distinguishing quality of Phidias, when contrasted with almost every other artist, ancient or modern, is the entire absence of anything approaching to mannerism or conventionality—a complete abnegation of self. Art so effectually hides art that we never think of the master. Nature has nothing of mannerism, neither had Phidias; his works have none of the severe, dry idealism of the Apollo, and they possess far more beautiful nature and simple grandeur of style and form than the Laocoon, or the statue known as the Fighting Gladiator, or the Faun. There is in these works of Phidias no attempt at disguise or trickery; everything is made out. Michel Angelo said:—"The sculptor never yet conceived a thought that yielding marble would refuse to aid, but never with a mastery he wrought Until the hand the guiding mind obeyed." Here, in these works, most assuredly there is no lack of power. The sculptor, perfect master of his art, intellectually and mechanically, appears to revel in difficulties and invariably succeeds in evolving beauties. Campbell somewhere observes:—"These great works do not appear to me to have been wrought with toil or long-continued labour; they appear as though the marble, in a state of fusion, had been run into moulds, thus producing works of surpassing beauty."

NOTES AND COMMENTS.

THE perfection attained by the photogravure process in Paris is suggested by a new print issued by the Librairie de l'Art, after the painting *Un excellent Pot au Feu*. For breadth of treatment and vigorous light and shade it will sustain comparison with the English mezzotints of the last century. The subject is simple, a poor *curé* watching the preparation of his dinner by his old housekeeper. It might have been inspired by the story, "Autour d'une Source," which is the masterpiece of GUSTAVE DROZ. In Mdlle. DESLIEN'S picture, a subject that has been generally vulgarised becomes fascinating. The new series of *L'Art* that is issued from the same office continues to excite surprise by the importance of the large etchings which accompany every number, for how can two dozen prints be bestowed with a publication costing 60 francs a year, when the majority are each worth that sum? It is a question which is as puzzling to dealers as to the public.

It is hard on poor people who are occupants of a house that cannot resist an extraordinary gale of wind if they have to clear out in a hurry and their furniture is considerably broken. As recent legislation inspires a belief in the humbler classes that if they suffer inconvenience somebody must compensate them, it is no wonder that in cases where tenement houses are injured the aid of the courts should be sought. The gable of a house in Dundee was blown away during the November gales, and the tenants fled with their belongings. Subsequently they brought an action against a financial association that held mortgage on the property. The Judge who tried the case decided against the tenants. He laid down the law on the subject by saying:—"A landlord does not guarantee his tenants against storms and earthquakes any more than he guarantees them against consumption or influenza or typhus or cholera. He undertakes to give a habitable house, so 'sound and watertight' as to afford a tolerable shelter from the weather and affording such comfort as the tenant is willing and able to pay for, and is prepared to accept as sufficient, or he ought not to take the house. If the landlord has cheated him, or wilfully maltreated him, or negligently failed in his duty, he may obtain damages against him just as against any breaker of contract or other wrongdoer. But before he can obtain damages he must both aver and establish fault against the landlord. In their averments, I am of opinion that the pursuers have failed to set forth any intelligible fault, or, in other words, to state anything that the defenders could have done to prevent the accident to this gable, as well as state what they might, had they been ordinarily far-seeing, have been reasonably expected to do. It is said that the gable was 'jerry built.' But to say that a wall is 'jerry built' is to say what could be said with truth of thousands of walls in Dundee, of tens of thousands in Glasgow, and probably of half the houses in most of the brick-built English towns. Tenants know about jerry building just as well as people who lend money upon jerry-built houses. The pursuers do not say when they went into or near this frail tenement that they did not know that it was not of substantial masonry; and if they knew, they went to the neighbourhood of a new danger and took their chance of it. I hold therefore that there is no sufficient averment of fault." The tenants will not be satisfied with the declaration, for they will say that if the law insists on drains being in a safe condition, why should gables be neglected?

It is to be hoped the litigation arising out of the erection of flats at the corner of Kensington Court has come to an end, since at the last hearing the County Council, or rather the ratepayers of the metropolis, were mulcted in costs. It will be remembered that in December last a summons was taken out with the object of obtaining an order for the enforcement of penalties against Mr. E. LAWRENCE, at the rate of 40s. a day, since October 15, 1892, for not reducing the height of the building. The magistrate took time to consider his decision. On Friday, the 2nd inst., it was given. Mr. CURTIS BENNETT said it was proved that the defendant gave the building up to the owner on February 3, 1893, and from that date he had not continued the offence charged against him. The question arose whether under JERVIS'S Act an offence had been

committed within a period of six months. The summons was issued in December last, and, as defendant gave up the building in February, no offence had been committed by the defendant within a period of six months. The continuing penalties were for not pulling down the building, which the defendant had no right to do. If he went on the premises he would be a trespasser. The question involved a loss of over 700l. a year to the defendant if he were liable for the continued penalties for his natural life for not doing that which he had no power to do. If he attempted to comply with the order, he would be immediately stopped by the Court of Chancery, because he had given up possession of the building. He found, in fact, that there had been no continued offence since February 1893, and he held under JERVIS'S Act that the six months' limit had expired, and that by law a builder could not continue an offence after he had given up possession. The summons was accordingly dismissed, and the London County Council were ordered to pay five guineas costs. Opinions may differ about the principle involved, which is whether the height of a building is to be determined by the width of the street on its longer or shorter side, but few will hesitate to agree that the County Council could have regulated the height before the works were started; and, in the second place, that it is a hardship on the inhabitants to have to pay a very large sum for law costs which were incurred in the endeavour to cloak negligence on the part of the Council.

A DEPUTATION from the Edinburgh Architectural Association on Wednesday attended the meeting of the Town Council, to offer some suggestions about the scheme for the rebuilding of the North Bridge, Edinburgh. Mr. W. W. ROBERTSON, the president, said that what they desired to impress upon the Corporation was that in the designing of the new bridge it was needful that the very highest architectural skill that could be procured should be conjoined with that of the engineer who was invited to design the structure. Although the conjoining of architect with engineer was unusual in Edinburgh, it had been done repeatedly in London with the very best results, notably in the case of the Tower Bridge and of the St. Pancras railway station, and on the Continent it was much more frequent. As to the buildings at the north end of the North Bridge, they respectfully wished the Corporation to use all their influence to see that the present restriction upon the height of these buildings should be maintained entire and undiminished. It was not always wise to depend upon beautiful drawings in a matter of this kind; the fact they had to bear in mind was that the proposals of the railway company involved an addition of at least 40 feet to the height of the existing buildings. Looked at from the west, the proposed buildings would wipe out a large part of the view of the Calton Hill. Looked at from the east, the effect of the increased height of the buildings would be most disastrous. From the Castle on the one hand to the SCOTT monument on the other the buildings would extend right across as a huge curtain, and fill up the valley to the vertical crag of the Castle. The carrying of the buildings up to a height of 100 feet would be to utterly ruin the aspect of the Register House, one of the best buildings in the city, and by being very much higher than the General Post Office on the opposite side it would destroy the aspect from the upper end of the bridge, with the Register House closing the vista. The Lord Provost expressed his satisfaction with the aim of the Association, and said the suggestions would receive the consideration of the Council.

IN July two British Institution scholarships (one of the value of 75l. and one of 50l.) will be offered to students of painting one of 75l. to students of sculpture, and one of 50l. for students of designing in black and white. The scholarships are tenable for two years. The competition is open to all art students who have obtained a gold medal, a silver medal, or a prize of 15l. in any art school of the United Kingdom. The subjects of the original designs which are to be among the examples submitted will be for painting, *Diana and Endymion*; for sculpture, *The Flight of Aeneas from Troy*; and for black and white the four lines with which GRAY'S "Elegy in a Country Churchyard" begins.



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PUERTA DEL PERDON, SEVILLE CATHEDRAL



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RESIDENCE: ST. MARY'S ROAD, LONG DITTON.



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Well in an old Palace. Jerez
Sept. 25th 90. Spain.

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DESIGN FOR GREAT ROMAN BATH, BATH.

PUERTA DEL PERDON, SEVILLE CATHEDRAL.

WELL IN AN OLD PALACE, JEREZ-DE-LA-FRONTERA, SPAIN.

THE MOSAIC DECORATION OF THE CHOIR OF ST. PAUL'S.*

THE eight spandrels of the dome of St. Paul's were filled with mosaic by Dr. Salviati of Venice, from designs by Mr. G. F. Watts, R.A., Mr. A. Stevens, and Mr. Britten, during the years 1863-92, the subjects being the Four Evangelists (St. Matthew and St. John, Mr. Watts; St. Mark and St. Luke, Mr. Britten), and the four greater Prophets (Mr. Stevens).

In March 1891, when the decoration of the eastward part of the choir was under consideration, Messrs. Bodley & Garner recommended to the decoration committee that Mr. W. B. Richmond, A.R.A., should be consulted. Mr. Richmond proposed that the decoration of the choir with mosaic should be commenced. He had made a careful study of the methods employed by the early workers in mosaic, especially at Ravenna, and he recommended that the smooth modern method should be abandoned and the bolder methods of the ancients be adopted in its place. These proposals were accepted. Mr. Richmond entered into an engagement to provide designs for the work for the three years ending in the spring of 1894, and to give his time and attention almost exclusively to this work at a very modest annual stipend suggested by himself. The arrangement recalls some of the most artistic periods of the Middle Ages.

The bay of the choir was originally occupied by stalls, the entrance to the sanctuary from the north and south being by the square openings which are now behind the new reredos, with the beautiful hand-wrought iron gates of Sir Christopher Wren's time. When the organ was removed from its original position across the western of the three bays of the choir in 1860, the choir stalls were moved one bay westward, and the easternmost bay of the choir was left clear, except that the stalls of the dean and residentiary canons and dignitaries were placed here as a temporary measure. In 1871 the organ was moved from the middle bay on the north side of the choir, where it had been placed in 1860 on the advice of Sir Charles Barry, and was put in its present position against the piers at the entrance of the choir. The stalls of the dean and residentiary canons and dignitaries were removed from their temporary position. The old gates which up to 1860 had closed the choir, westwards beneath the organ, were adapted and supplemented, and they now form the ironwork of the brazen gates or golden gates by which the present sanctuary is entered from north and south.

The original sanctuary bay, with its square openings, is quite different in design from the three bays of the choir. Its design is the same as that of the bays leading from the dome into the nave, choir and transepts, the only difference being that it is pierced to give access to the original sanctuary. Sir Christopher Wren carried these five bays up to the spring of the roof with large rectangular panels, and in the roof he broke them into thirty-three smaller panels, deeply sunk, each panel carrying a massive boss of stone sculpture. It is evident that this arrangement does not lend itself to mosaic treatment. The whole of this part of the roof of the sanctuary was covered many years ago with heavy dark gold, quite unrelieved. Everything has now been done to give relief. Lighter gold has been used, the field of the panels has been coloured, the bold sculpture of the bosses has been brought out by light-coloured gesso washed into the inner parts, and all the plane surfaces, whether in gold or in colour, have been broken up by small patterns, scarcely distinguishable from below, to remove any sense of monotony. Similar treatment has been applied to the stone ribs of the roof in the apse and in the choir bay, to the great ring of sculpture round the saucer dome in the choir bay, to the canopy of the clerestory windows, and generally to the parts which do not lend themselves to mosaic treatment.

The apse, the sanctuary bay, and the choir bay may be considered separately for decorative purposes. The treatment of the sanctuary bay may be regarded as an example of what may be done with the four similar bays round the dome, perhaps with less of the main surface covered with gold, and with

less colour on the sunk surfaces. The treatment of the choir bay may be applied not only to the two remaining bays of the choir, but also to the three similar bays of the nave, and the bay in each of the transepts.

First, then, the apse. The three panels in the roof of the apse are naturally of a difficult form, broad at the bottom and narrow at the top. Further, the lower part of each is pierced by a great round-headed window. The space that remains above the window does not afford an easy task for the artist, and the difficulty is not diminished by the curvature of the surface. These difficulties have been met in a way which leaves no trace of them.

The central panel is occupied by the representation of Our Lord in Majesty (Revelation iv.), seated on the rainbow throne. The effect is that of majestic dignity. The light colours of the robe, set out by the dark colours of the neighbouring designs, make this panel clearly visible to the extreme west of the church, especially in the early morning. The background is a whirl of wings, suggesting the idea, "He came flying upon the wings of the wind." Below are the sun and the moon, their light paled in the presence of the greater Glory. The details of the crown are exceedingly rich. The face has received special care, having been more than once re-laid, first to introduce greater strength, and then to remove some of the sternness which the strengthening of the lines had caused. It was a question whether there was really room in this panel for a subject of sufficient grandeur; but the skill of the artist has made the space large enough.

The panels to the left and right of this are occupied by the recording angels. On the north side an angel stands erect, beckoning, with two other angels, carrying crowns; at their feet, arranged so as to occupy the difficult space round the head of the window, are two angels supporting the scroll which represents the book of life (Revelation xx. 12). On the south side the central angel is in the attitude of repelling, and the angels at the side are weeping bitterly; the angels at their feet support scrolls. The central angels in these panels are the nearest approach in Mr. Richmond's work to the Byzantine stiffness of some of the earliest mosaics, the object being to produce a strong contrast with the figure in the central panel.

In a tier below these are two panels on the projecting piers which carry the stone ribs of the roof. They range with four others, two on each side of the original sanctuary bay. On these six figures have been worked in mosaic, typical of six Virtues named in the Revelation. These are, beginning on the north side and passing round to the south:—1, Hope; 2, Fortitude; 3, Charity; 4, Truth; 5, Chastity; 6, Justice.

Lower still is the frieze below the cornice, which runs round the sanctuary bay and the apse, but is wanting in the bays of the choir, nave and transepts. This carries, in black mosaic letters on a gold ground, the words "Alleluia, Sanctus, Sanctus, Sanctus, Alleluia." The division of this band into sections by the projecting friezes of the pilasters and the large size necessary for the letters have made it impossible to use the whole of the passage in Revelation iv. 8 or the passage in Revelation iv. 11. At St. Peter's in Rome the letters of the inscription are carried on to the projecting friezes of the pilasters, but it was thought that the effect there was not on the whole good.

It may be remarked that though the stonework has of course had to be cut away to a depth of about three-quarters of an inch wherever mosaic is laid on the Portland stone, the mosaic brings the surface in all cases exactly to the original plane. There has in no case been any tampering with the contours or mouldings of Sir Christopher Wren, though in several cases a freer field would have suited the mosaic better. The panels in the roof of the apse and the saucer dome and pendentives in the choir bay were all laid by Wren with red bricks of very fine make, forming an admirable surface for the reception of mosaic.

The windows of the upper tier in the apse come in the midst of mosaic, and special treatment of them was necessary. The colours must harmonise with the colours of the mosaic, and while the windows must look bright they must not dazzle the eye which seeks to see the designs in the panels. More will be said on this when we come to the clerestory windows of the choir. For the present it is enough to say that the subject of the windows is taken from the same chapter (iv.) of the Revelation, the four-and-twenty Elders with their golden crowns, eight in each window. At the head of the north and south windows is a circular crown, containing emblems of the Evangelists, St. John and St. Luke, on the north. These are surrounded by a ring of twelve cherubs. Below are three Elders, with two angels with purple wings; below that again five Elders, and at the foot five angels with ruby wings, carrying censers. In the central window the Archangel Michael stands at the head, the arrangement of the other parts of the window being the same as in the side windows. The decoration of the dresses will show how careful the work is, but details on that scale can only under exceptional circumstances be analysed from the

* A description prepared by the Rev. Canon Browne.

floor of the church. It is hoped that arrangements may eventually be made to enable small parties of visitors to stand in safety on the cornice in different parts of the church for the purpose of closer inspection. The full-sized cartoons for these windows and for the two clerestory windows were made by Mr. Richmond, and the work was carried out by Messrs. Powell under his supervision.

In the original sanctuary bay there are two large rectangular panels on each side, above the square openings for the gates. The elongated form of the upper of these, which correspond to the dark storey or triforium of a Gothic church, naturally suggested something of the nature of a procession, or a row of figures. The subject adopted is the sea giving up its dead (Revelation xx. 13), still in connection with the subject of the apse roof. The lower panels lend themselves better to groups of figures. The subjects are, south, the Sacrifice offered by Noah (Genesis viii. 20-22), and north, the Blessing of Abram by Melchizedek (Genesis xiv. 18-20). The borders of these panels are very rich, representing the fruits of the earth. It will be seen that they are in character with the beautiful wood-carvings of Gibbons on the frieze above the choir stalls and with the stone sculptures in relief in many parts of the church.

The Portland stone of the fluted pilasters in the apse and on the east side of the sanctuary bay has been replaced by rich green serpentine. The reredos in the apse, from the design of Messrs. Bodley & Garner, with a copy from the Cima in the National Gallery of the Doubting of St. Thomas, has been erected by the Liddon Memorial Committee. The committee have also placed here the recumbent monument of Dr. Liddon, for twenty years canon of the cathedral; it is a noble work, by Messrs. Farmer & Brindley, from designs by Messrs. Bodley & Garner. The three windows are by Mr. C. E. Kempe. The east side of the large reredos is to be polished and decorated, and the brazen doors in the reredos are to be decorated on this side. The walls and pavement are to be restored. When the whole is complete, this is to be called the Jesus Chapel, and is to be used on some special occasions.

We now come to the easternmost bay of the choir. This offers nineteen spaces for mosaic treatment; and of these eleven are completed, including all the largest. In the spandrels of the arch on the north side two angels are placed, reclining on the battlements of Heaven, guarding the instruments of the Passion; the angel to the east has the spear, the other has the nails on a golden disc. In the centre is a source of light, with the words "Gloria in Excelsis, Glory in the Highest." The figures convey the sense of watchful repose. When there is a fair light the coruscation due to the varying angles at which the golden tesserae are set is a great beauty; this is usually best seen from the extreme south-west corner of the choir aisle.

This was the first work done from Mr. Richmond's designs, and it was taken as a test of the fitness of his methods. It will be an interesting study, for ages to come, to pass from one part of St. Paul's to another, beginning at this point, and note the gradual growth of the English School thus inaugurated. The growth in three years is in itself remarkable. The spandrels on the south side will carry two angels with other instruments of the Passion. The Portland stone of the pilasters has been replaced by Pavonazzo marble, specially selected to harmonise at once with the mosaic and with the marble of the reredos. It will be seen that there is still much to be done with the capitals of the pilasters and some of the stone surfaces.

Passing to the space above, where the triforium openings would come in a Gothic church, three rectangular panels present themselves on each side. These are for the present left untouched. They will be occupied by groups of a processional character; but it is intended that the great procession shall be reserved for the north and south halves of the drum of the dome.

From this point to the top of the roof all is finished on both sides. It is better to mention first the saucer dome at the top, for it was the second piece of work done, and the chronological order is important. It represents the creation of the birds. In the centre is the inscription "et volatile sub firmamento," and fowl in the open firmament (Genesis i. 20). Round this is a ring of small birds; then a larger circle of golden eagles with outstretched wings, the tips of their wings almost touching. Then, still further from the centre come the beginnings of the clouds and the tops of the mountains and trees; and finally, near and at the border, the ground, with water here and there. The beauty of the birds collected at this part of the dome is very great, peacocks, turkeys, cranes, swans and so on. One of the finest peacocks may be seen a little to the east of south. The fruit and flowers of the trees and the magnificent lilies towards the east are very striking. In a modest little square on the circumference, at the south-west, is the date, "A.D. 1892."

It has from the first been a question whether the tone of this large area is sufficiently bright, and there will no doubt continue to be two opinions on the subject. To fill the saucer domes with subjects so clearly defined that they explain them-

selves without any effort on the part of the spectator would have the effect of lessening the height of the roof. On the other hand, as the light can never fall nearly normally on this part of the mosaic, colours that require full light to make them look bright are not suitable. The light in London is not like that in Rome, and that fact of itself imposes limitations on the use of colour. All these points, and others more subtle, the artist has carefully considered. But no doubt the study of the general effect at different times of the day and year when the scaffolding is removed and the full play of reflected light from the pavement and elsewhere falls upon the dome will settle the question, and the experience will not be neglected when the other saucer domes come in turn to be treated.

The four pendentives to the saucer dome offer the most conspicuous surfaces in the church for mosaic subjects, but their form limits strictly the choice of subject. Each is occupied by an angel bringing a message from heaven in the attitude of being on the point of alighting on the earth. The extended arms have the incidental effect of supporting the great ring of sculpture round the saucer dome. On the pendentive to the north-east is the inscription, "Populus qui ambulabat in tenebris vidit lucem magnam" ("The people who walked in darkness have seen a great light," Isaiah ix. 2). On the north-west, "Parvulus enim natus est nobis, filius datus est nobis" ("Unto us a child is born; unto us a son is given," Isaiah ix. 6). On the south-east, "Factus est principatus super humerum eius" ("The government shall be upon his shoulder," Isaiah ix. 6). On the south-west, "Vocabitur nomen eius admirabilis" ("His name shall be called Wonderful," Isaiah ix. 6).

The splendour of mosaic work and the brilliancy of the old method is nowhere more clearly shown than in the four great spaces by the sides of the clerestory windows. The north side of the choir is to represent the ancient world looking dimly forward into the future, with no limitation to the Old Testament. Beginning at the north, the figure to the east is the Delphic sibyl, with the word "Delphica." The revelation is represented as brought by a wingless human figure. To the west is the Persian sibyl, Persica, with three winged figures bringing the revelation. All the details of the robes of the sibyls and of the architectural and other features of the composition are exceedingly rich. The effect produced by the intentional roughness and irregularities of the setting of the tesserae and the variations of the angle at which they are set is very striking, whether the spectator is close at hand or far off. Below the window are the inscriptions, "O Sapientia, veni ad docendum nos, O Oriens, splendor veni et illumina nos" ("O Wisdom, come and teach us, O splendour of the East, come and enlighten us"). These are portions of ancient antiphons to the Magnificat for December 16 and 20.

The south side is to represent the Temple builders. The figure to the east is David, with the harp; that to the west, Solomon, seated on the lion throne. The difference between the simplicity of David's dress and the magnificence of Solomon's should be noticed. Here, too, as in the case of the sibyls, the skill with which the artist has made his design fit the great raised scrolls of Sir Christopher Wren on each side of the window should be observed. The inscriptions below the window on this side are, "O Radix Jesse, veni ad liberandum nos, O Clavis David, veni et educ vinctum" ("O Root of Jesse [Isaiah xi. 10], come and release us, O Key of David [Isaiah xxii. 22], come and set the captive free"). These are portions of ancient antiphons to the Magnificat for December 18 and 19.

The clerestory windows themselves are specially designed by Mr. Richmond with a view to the circumstances. Something was said of this in connection with the apse; but the circumstances here are very different, and the treatment is as different as well could be. The intention of the large amount of lead employed is to close up the window as much as possible when seen in profile, as it were, from some little distance to the east or west, or from below. The eye of the spectator in such a position can rest on the mosaic at the side without being dazzled by the window, while yet the light is passing through in full force to illuminate the mosaics on the other side of the choir. For this purpose a maze of continuous flowing pattern was required, and Mr. Richmond has found what he wanted in the surface decorations of the seventh and two or three following centuries, examples being found in various parts of England dating long before the Norman Conquest. The main part of each window is occupied by spiral tendrils springing symmetrically from a central stem, each tendril containing an angel. This is, of course, a well-known pattern. It is found on an Anglian stone at Jedburgh, sculptured when Jedburgh was still part of Northumbria; the spiral branches there are occupied by squirrels and other creatures nibbling the buds. The angels in the tendrils are variously occupied: some are armed, and using their arms; some carry shields, with Fortitudo, Prudentia, Justitia, &c.; some are engaged in agricultural pursuits. The north window was put up first. It will be seen that the window on the south shows a greater warmth of colour, the wings of the angels

being very beautiful. Throughout these windows the pattern is formed by the lead.

The borders of the windows are taken from several sources. On the north, the border at the top is copied from pre-Norman decoration in stone at Britford Church, near Salisbury, as also are the two corner pieces at the bottom. The patterns up the sides are found in England, Scotland, Ireland and Lombardy; for instance, at Rothley Temple (Leicestershire), St. Vigean's, near Arbroath, the Romanesque church of St. Abbondio at Como, and in the Cassiodorus MS. at Durham of Bede's time. The pattern at the bottom is composite. On the south side, the birds in scrolls at the top are of a type found in pre-Norman England, notably at Bewcastle and Ruthwell; in the ivory chair of Maximianus at the Duomo at Ravenna; at St. Abbondio at Como, &c. The pattern up the sides is distinctly non-Anglian, so far as the doubling back of the band between the systems of circles, a feature never found in the early work of these islands. It is wrought in stone as a border round the east window of the main south aisle of St. Abbondio, and from its condition there it may be assumed that it is a portion of the decoration saved from the original church of the seventh century, when the present noble church was built in the eleventh. Without the feature of doubling back, this pattern is found very frequently in early work in England, Scotland and Ireland, both in stone and on parchment. A fine example has lately been found as far south as Wantage. The pattern at the bottom, consisting of "Stafford knots," is one of the most usual of the patterns in early Anglian work. As used here, with rosettes inserted, it closely resembles some white marble screens in the ancient cathedral of St. Lucius at Coire, probably preserved from the still earlier church. The border of the north and south windows in the apse is Celtic, a triangular meander.

Inscriptions will be seen on the sides of the stone ribs of the roof on each side of the saucer dome. On the side facing westward "Omnes volucres celi" ("O ye fowls of the air"), words from the Song of the Three Children, indicating that the subject of the mosaic in the saucer dome is the creation of the birds. The second saucer dome is to show the creation of the fishes, and the west side of the next rib will carry the words, "Omnia quæ moventur in aquis" ("All that move in the waters"). The easternmost of the saucer domes will show the creation of the beasts, with the words "Omnes bestię et pecora" ("O all ye beasts and cattle"). Lastly, on the west face of the rib on the west side of this third saucer dome will be the words, "Benedicite Omnia Opera Domini Domino" ("O all ye works of the Lord, bless ye the Lord").

Turning now to the eastward sides of these four ribs, two of which are completed and carry respectively the words "conspiciuntur" and the words "sempiterna eius virtus et divinitas," the intention is to place on the four ribs the verse Romans i. 20, arranged in the following order, beginning at the entrance to the choir:—1. "Invisibilia eius a creatura mundi" ("The invisible things of Him from the creation of the world"), 2. "Per ea quæ facta sunt intellecta" ("being understood by the things that are made"), 3. "Conspiciuntur" ("are clearly seen"); 4. (directly facing the Majesty) "Sempiterna eius virtus et divinitas" ("His eternal power and Godhead").

The pattern on the sides of the stone ribs has been designed for the purpose of giving breadth to the surface, which in itself seemed too narrow to carry letters of sufficient size. It is only one foot broad. The fact that the gold ground of the mosaic in the roof is brought close up to the edge of the band also gives it breadth, the characteristic of gold being that two surfaces meeting at an obtuse angle seem at a distance to be in one plane. This effect can be seen well near the word "conspiciuntur."

Some facts about the areas covered and the amount of glass used may be interesting.

The saucer dome contains 532 square feet, and each pendentive 140; this gives a total of 1,092 square feet. The number of glass tesserae used for this area is about 1,100,000, and their weight about a ton and three-quarters. The mastic cement in which they are laid is a very careful composition, with ingredients which cause it to set like stone. It is made of the same red colour throughout, so that wherever it shows between the tesserae—and that is very frequently, in the bold method used here—it produces one and the same effect. The weight of the cement in which the tesserae of the saucer dome and pendentives are laid is two tons. The whole area so far covered, not reckoning the six panels and two spandrels which are left untouched in the choir bay, is about 3,255 square feet. This means about 3,300,000 tesserae, weighing over five tons, and six tons of cement.

About one hundred and fifty different tints of glass are in use for the tesserae. The number at first was considerably larger than that; indeed, it still is practically larger, for one sheet of glass containing crackled gold, when cut up into pieces, gives tesserae differing considerably from one another in tone.

It may be well to add a word as to the manner of setting the tesserae in the cement so as to produce the design. A full-sized cartoon is drawn by the artist, fully coloured. A tracing is taken of this with charcoal on tracing-paper, the lines of colouring of the design being carefully followed. This tracing is then laid in the proper place on the surface of the cement, or if the design is too large for that, the cartoon and the tracing-paper are cut into pieces of convenient size, and one piece is dealt with at a time. The mosaic worker pricks through the tracing-paper into the cement with a bradawl, following, say, a line of black colouring. He then folds back that portion of the tracing paper, and referring with his eye to the coloured cartoon from which the tracing was taken, which hangs near him or lies at his feet, he inserts tesserae of the proper colour along the lines marked by the bradawl. The part of the tracing-paper folded back is then turned on to the surface of the cement again, and another line of colour is marked with the bradawl; and so on. It will be seen that in this process the mosaic worker is using his intelligence actively the whole time. He has besides to decide, as he goes on, many questions; as, for instance, the size of tesserae to use when he is working on a vanishing line of colour; the amount of irregularity with which the edge of each shall be set in relation to the neighbouring edge; the amount of cement he will show between two tesserae; and the amount of departure from the normal which he will allow in places where brilliancy is to be produced by setting the tesserae at varying angles, so as to provide facets on which the light from many quarters may be reflected to the eye. This is very different from the purely mechanical work done in England when the mosaics are made in Italy. In that case the tesserae are all cut and placed in design in the foreign studio, and sent to England in sheets. The tesserae are merely taken up one by one by workmen here, and put into the cement on the wall each in the place assigned to it.

A rough estimate can be formed of the amount of mosaic required if (1) the three bays of the nave, the bay in each of the transepts, the two remaining bays of the choir; (2) the four bays opening out of the dome; (3) the concaves and galleries in the dome, and the drum of the dome; (4) the great saucer dome at the entrance to the nave and other suitable surfaces there, are all treated as the eastern bay of the choir and the sanctuary bay have been treated.

(1) Each of the seven bays will require rather more than 2,050 square feet of mosaic, about 14,500 square feet in all.

(2) In the transepts the lower panels of these bays are occupied by sculpture. In the choir they are hidden by the organ. In the nave they are free. Leaving all these out of consideration, and counting only the long rectangular panel and two piers above the cornice in each case, these eight panels and sixteen piers contain about 600 square feet.

(3) The four concaves and portions of the roof of the four galleries may be put in all at about 1,600 square feet; and a band of mosaic ten feet broad (half the height of the drum) running round the dome above the whispering gallery will contain about 3,500 square feet.

(4) The great saucer dome gives an area of about 1,520 square feet. The amount of mosaic required for this part of the church may be put at something more than 2,000 square feet.

These amounts, with the 3,255 square feet already done, give a total of about 26,000 square feet. If that is a correct estimate, about seven-eighths of the work still remains to be done. If the decoration committee had the necessary funds at its disposal, the work might be completed in fourteen years from the present time.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. Messrs. F. B. Dunkerley and H. L. Anderson were elected members.

Mr. S. B. BEALE read a paper entitled

Colour in Street Architecture.

Mr. Beale said:—In introducing the subject of "Colour in London Street Architecture" for discussion this evening, I am aware of the initial difficulty of saying much that shall be both new and original. I hope, however, to show some justification by emphasising the importance of good colouring, by rapidly noting some of the colour effects to be seen in building materials of long standing, and then (for I think the time has arrived when we may profitably do so) to review some of the colour effects produced by the use of one or two materials of modern introduction, with the object of discovering, if possible, how far the promises of twenty years ago have been fulfilled by performance.

Colour in architecture appears to me to hold a position in importance possibly second to composition, but certainly before detail. It is unsafe to definitely say that colour is of second importance, for the composition of a front may be good,

but bad colouring will ruin it. Also, a building well massed and good in colour is successful, independently of its composition. The reason I have for placing colour tentatively second to composition is in view of the case in which the massing and composition of a building are both bad—then, neither colour nor anything else will save it.

Utility and artistic treatment in planning, composition and detail, are now brought to a high state of perfection, while colour, the one feature that appeals to all, remains stationary and unsuccessful. In London it is a hundred years behind its co-factors in good architecture, and will remain there so long as detail is treated as the more important of the two.

For mere professional credit's sake it is important that our buildings should be invested with good colouring, but if a stronger argument is needed to show the necessity, it lies in the effect of colour on the eyes, the dispositions and the health of the citizens. Nine persons out of ten receive an impression from the architecture they pass in the street; sometimes it is the form, more frequently it is the colour, that produces it. Form is the first seen, colour is the last forgotten.

Ours is not a cheerful city in point of architectural tints, and yet, in the main, it is what architects have made it—evolved from indifference rather than from design. A sunless sky and a murky atmosphere may accomplish a great deal in the depression of human spirits; the effect, however, is small compared with the amount of work done by the dismal walls of architectural colour that line our thoroughfares in all directions. The atmospheric outlook is made the scapegoat when our spirits are at zero, but it should be remembered that a cloudy firmament, though perhaps poor in colour, is usually rich in form, while the colours in the handiwork of man frequently have nothing to mitigate them. In this age of hard work, close reading and sedentary occupations, the contemplation of scenery, light and colour is the recreation of the eye, and the walk along the street is the main opportunity for it. If, then, the field over which the eye wanders is nothing but blackness and gloom, the eyesight of millions must be deteriorated by the want of colour in their surroundings. We must all have felt the gentle cheerfulness that comes on beholding good harmonious colouring, and who can deny its powerful influence in producing the bright and open disposition of the countryman, dwelling in the midst of nature's colour wealth, or in fostering the hopeless despondency of the town man surrounded by eternal gloom?

Colour, too, affects the health in many ways. It is reported on good authority that medical men appreciate this fact, and in certain cases prescribe a scheme of colour decoration for the interior of their patients' rooms instead of physic for another interior. However this may be, it is certain that colour surroundings have very material physical effects on mankind.

The principles of good colouring are few and definite enough, but individual taste is dependent upon individual feeling and sentiment. White is perhaps the best and purest medium for architectural expression, but the surroundings essential to its existence are a sunny clime, a pure atmosphere, and brilliant patches of colour to give relief. These are accessories not known in London. White, as it is to be seen pleasantly weathered in masonry and plaster-work on the Continent, does not and cannot exist as a medium for architectural expression in the materials now used in this Metropolis. In name our colours range from white to grey, yellow to red, rising in the streets with total disregard to the harmony or contrast of adjoining premises. The effect, good or bad, is, however, of little moment at the time, for a grim spectre spreads its sooty mantle on all alike, reducing them to harmonious obscurity. Some of the reds proclaim their identity in the fitful gleams of sunshine, but the whites, greys and yellows maintain a strict incognito after a few years' investiture. There is not a thoroughfare in the whole City of London, nor half a dozen in the four-mile radius that one would choose to walk down on account of the pleasure derived from the outing. In some of the materials the self-colour is bad to begin with, in others the colours are good but badly disposed; in many instances a visible coating of dust and soot obliterates the tints, but in the majority of cases the materials soaking up the grime have weathered black. Queen Victoria Street, in the City, and Victoria Street, Westminster, are fine fields for study in any of these effects. London's colour does not compare favourably with that of many continental cities.

Anyone who saw the exhibition of Mr. Rimington's drawings of Spanish towns, for instance, after making due allowance for idealistic treatment, must agree that ours is a colourless city compared with the brightness of many on the Continent.

Having come to the conclusion, after long observation, that the colour of London street architecture is dismally bad, I will endeavour to differentiate between the cause of and the responsibility for the same.

The final cause is the work of many contributory factors, the chief of the offenders being that insidious demon, the town atmosphere, aided by narrow thoroughfares and high buildings, but even these agents would have but little effect in obliterating

colour were it not for the position of London in the sunless valley of the Thames. These, then, are the immediate agents acting on impressionable materials. So far, it is just and right to say the climate and dreadful atmosphere are the causes of the gloom that surrounds us architecturally, but when we go a step further and find that the materials used by architects are particularly susceptible to these influences, and that architects know them to be so, and are perfectly well aware of all the drawbacks to the maintenance of good and cheerful colouring, then I think, in continuing to use these materials, as a profession we alone are responsible for the gloom in which the Metropolis is wrapped from end to end.

Before attempting to inquire in what direction improvement may be looked for, it will be instructive to notice the evolution of colour in some materials under the effects of a town atmosphere.

Stock brickwork, beginning life in a suit of bright yellowish ochre, is lowered after a few years by the solution of rain and soot on its surface to a brownish-grey. A few more seasons eliminate the brown, producing a blackish grey in fair weather, slaty grey in a strong light, and absolute uncompromising black in shadow or wet weather. In such colours Great George Street, Gower Street, Whitehall Place and other stock brick thoroughfares are rich. This work appears to have no weathering qualities whatever, the nature of the material not permitting them. Dust, rain and soot are soaked up uniformly over the surface, wind and other weathering agents making no variety in the tones. Of all the colours to be seen in London street architecture stock brickwork, in whatever aspect, produces the most hopeless and depressing, and there is only one merit that saves it from provoking all the anathemas of Ingoldsby's Lord Cardinal, and that merit is the possession of a powerful contrasting effect on any bit of colour that happens to be planted in its midst.

Yellow malms in London appear to voluntarily shed their colour independently of the action of the atmosphere, the surface becoming even in favourable positions an ashy grey.

Of the many kinds of red brick in use there are really very few of an artistic tone. Great improvements are made from time to time in the manufacture and burning, but the truer the brick in shape and the harder it is in texture, the duller and more lifeless the colour becomes. The Ellistown bricks, now largely used, possess several practical advantages, but in colour do not satisfy the critical eye. A nice piece of work has been executed in Fareham red bricks in the new Admiralty extension, a tender surface relief being produced by using haphazard bricks of slightly varying depth of colour tone. The aspect and position of this work promise well for weathered effect provided the rain washings from the contiguous stone do not play their usual tricks with the front. It must be admitted that the majority of brick buildings, when newly erected, are certainly bright, and in many instances good in colour. The red examples in Fleet Street by St. Dunstan's Church were brilliant when drawn a few months ago. Twelve months hence they will have sobered into respectability, and then the grimy zephyrs of Fleet Street, year by year adding one more fold of the dreaded shroud, will finally wrap them into obscurity. The ideal tone for red brickwork is purely dependent upon individual taste, but I will express the opinion that, given favourable conditions of site and aspect, a front built of bricks with a virgin surface of colour approaching the lightness of tint possessed by rubbed work would produce a more pleasing effect than the heavy reds in general use.

Of all materials, red rubbed brickwork properly designed on an open site with a western aspect is capable of showing the most beautiful weathered effects; but in few instances of its use has it been properly managed, or are the conditions favourable. As to the management of the material, the use of limestone in cornices, copings or projecting strings in conjunction with rubbed brickwork is disastrous, as, even with a good aspect, the effects produced are more striking than beautiful. A chemical, or, it may be, an electrical action is set up by the atmospheric impurities, washing from the freestone on to the rubbed brickwork, blackens it, and forms a crust of disintegrated material. This crust then voluntarily wears off.

It is curious, however, to notice that rubbed brickwork immediately below a flush freestone band, except when contiguous to the ground line, is not damaged in the manner just described, but becomes nicely toned with age, tending to prove that even the contiguity of limestone is not prejudicial so long as wind and rain are allowed free action on the surface. The Alliance Assurance Office, at the corner of Pall Mall and St. James's Street, built in red brick, partly rubbed, and stone dressings, is, as would be expected from Mr. Norman Shaw, everything that could be wished in mass, composition and detail. The colour effect after some ten years' existence is unfortunately far from pleasing. In this instance the western front has become more enveloped in grime than the southern front. The incrustation of dirt on sheltered and recessed parts, and on the ornamental frieze, has seriously obliterated the original colour, while the overflow from the stone dressings of icicle-shaped pattern in a

sooty lime medium are very unsightly on the red brick surface. A small portion of the fronts above the principal cornice, together with a few square feet on the angle turret where the elements have had full play, exhibit a charming effect, giving promise of what might have been under other circumstances.

All brick treatments seem to require a good self-colour to begin life in our streets with, for bricks do not weather after erection in the same manner as the separate blocks in a stone front may be expected to do. Aspect also appears to make much less difference to the coloured effect of brickwork than it does to stone.

Of the two varieties of Portland stone so much favoured in London, the white is with difficulty prevented from turning black, and the brown a tone only one degree less dreary. There are a few examples of nice delicate weathering in this material to be seen, the position usually being the exposed part of the return flanks of high buildings above the roofs of lower ones. The Criterion Restaurant exhibits a small specimen. This piece of masonry receiving the full force of the west wind and rain driving unobstructed from the direction of Piccadilly has assumed a very tender weathered effect, in spite of the closeness of a batch of smoky chimneys.

The west but not the south front of the Duke of Buccleuch's house in Whitehall Gardens is an instance of clean weathering in stone, the effect being due probably as much to the proximity of some large trees as to aspect and free exposure.

It is difficult to explain all the colour effects seen in London stonework. The whiteness of balustrades and attic storeys, also the piebald effect on many columns, may be accounted for, but the causes of some other effects to be seen, it passes the wit of man to discover. For instance, in contrast to the pleasant appearance of the Duke of Buccleuch's west front stands the Board of Trade office, a few yards away, with the same aspect, but covered with a visible coating of coal-black grime which the difference in age does not account for. I cannot explain the weathered angle of the National Liberal Club, a comparatively new building, as illustrated on the screen.

Of the few coloured stones used in the Metropolis Ham Hill has received some attention lately. As a contrast to other colours, the bright ochery tint is a relief, and I look forward with interest to the time when the weathered effect of the new Travellers' Club may be examined. The position of this club is very favourable for the development of tender weathered tones, but yellow of any kind is at best not a permanent colour in building material.

Daly's Theatre in this stone is losing the coarseness that was apparent at first, but there is little hope that any colour whatever will be discernible after a few years of the atmosphere of Leicester Square.

Probably there are many Ham Hill stone fronts of longer existence than those mentioned, but it is not possible to recognise them in their present garb. I now turn to a stone which stands town environment admirably, and weathers to nice tones. Red Corsehill has been sparingly used in street fronts, considering the marked indifference it shows to the attacks of the sulphur-laden atmosphere. A very good example may be seen in the front of Messrs. Tooth's Art Gallery in the Haymarket, by Messrs. Archer & Green. There are no accretions of grime on the work, each stone is marked by tender variations of tone, no unpleasant stains mar the general effect, and from all points of view this front of Corsehill is a pleasing bit of colour in the midst of a wilderness, bright and fresh after ten years' existence in the Haymarket. Corsehill stone also possesses the advantage of being more colour-some in wet than in fine weather.

Red and grey granites have good natural colours which, however, are subject to the same obliteration in street architecture as the tints of humbler materials. If unpolished granite when used in plinth bases could always be given an inclination from the vertical, the colour would longer remain visible, and a clean effect be obtained. The introduction of polished granites in the small panels of stone fronts fails to give the colour relief desired, for even the shallow recess of a sunk panel affords sufficient shelter to allow of the formation of an opaque film which obliterates the tints.

Granites under conditions which unfortunately will never occur would be absolutely the best materials in point of colour, durability and imperviousness for the exteriors of London street architecture, polished parts for relief being used as dressings. But this is the dream of an Utopian age, when the coin of the realm shall no longer hold sway in human concerns.

Of all building materials black marble stands pre-eminently first in point of beauty. A London street front, however, is not the place for it, except under very propitious circumstances. Colonel Edis, with great courage, has freely used it in the front of the new Junior Constitutional Club. Its position, an open one, good in aspect, and with plenty of leafy trees near to absorb impurities, is eminently favourable. It will, therefore, be interesting to note how the material has weathered at the end of a few years. The pureness of the colour will depend

upon the preservation of the surface; if this is soon destroyed terra-cotta manufacturers will breathe again. It is to be devoutly hoped that the club will retain in the years to come its pristine purity of tone. At present it certainly realises all that could be desired in architectural colour effect.

The use of metals for the purposes of decoration in street fronts is evidence that there is a desire to brighten things up a little. Experiment in this direction is risky, however. The large metal caps and bands on the marble pilasters to the front of the Tivoli Music Hall were very bright and striking once, but—they are another colour now.

In viewing the chiaroscuro of the London streets, compo and plaster-work cannot be ignored. In the light of architectural knowledge in the last decade of this century, compo is a most unarchitectural material. The marked prevalence of it in the well-to-do quarters of the town, executed, I suppose, some forty or fifty years ago, exhibits the marvellous strides architecture has made since that time. The acres and acres of compo-work in the north-west of London, in and around the whole of the Regent's Park district, and brought right into the centre of civilisation by that graceful artery Regent Street, shows very plainly that this material was in great favour at one time and used by men who undoubtedly possessed a keen appreciation of the value of breadth of treatment and boldness of detail, but who troubled not about colour. What the effect would be if the natural colour of all this compo-work could be seen is not pleasant to imagine. The tints that meet the eye range from a warm stone to mahogany colour, both ground in oil.

The milk-white effects that enter so largely into the colouring of continental towns and cities exist mainly in plaster-work. Modern London contains few specimens of such, a fact that I do not think is to be regretted, as such effects are usually coupled with bad building.

The consideration of plaster and compo-work naturally leads on to the subject of colour put on with a paint brush, and I must confess to a feeling of uneasiness in dealing with it. On the one hand, one knows what Regent Street, for instance, and the many miles of suburban architecture would be like without the four coats of common colour, Bath stone even in many cases owing its continued existence in a London atmosphere to the protective agency of white lead and oil. On the other hand, it appears to be the lowest depth of technical immorality to cover the externals of architecture with a coat of paint. In endeavouring to justify its use, one is led away by the seductive appearance of the nice, clean, stone-colour effect on a fine spring morning, when the cradle has been lowered. It is such a vivid reminder of what the colour of honest building materials might be in brightness and tone. As practical men, I suppose we must endure it as a necessary evil, but, as artists, avoid it like a plague. The greatest bar to its favourable consideration no doubt lies in the abuse of the medium. Tints ranging from salmon pink to navy blue on street fronts do not add to the artistic colouring of London street architecture. The only safe course then, perhaps, is to forswear the use or any building material that is ever likely to stand in need of a coat of paint.

There is one important material yet to be dealt with, and as the colour effect of terra-cotta formed originally the central *motif* of this paper, it would appear desirable to say something about it, although criticism on the subject, like the material itself, is very nearly done to death. When terra-cotta first came into general use it was thought that at last a material had been found which would revolutionise the colour effect of the old materials, and open up a brighter prospect for the jaded Londoner. This material has now had at least fifteen years' experience. We are, therefore, in a position to review how far results to-day agree with the original promises.

(To be continued.)

A NEW PALACE IN VENICE.

AN occasional correspondent of the *Scotsman* gives the following account of a Gothic palace which has been erected on the Grand Canal:—

Four hundred years have passed away since the last Gothic palace was erected in Venice, and one hundred and fifty since a palace of any kind was constructed. Not only that, but during these past centuries, whilst little or nothing was erected, hundreds of palaces were destroyed. Since the time of Napoleon alone it is calculated that between two and three hundred palaces, in all kinds of styles of architecture, have been demolished. Now, happily, all that is ceasing. The last twenty or thirty years has been a period of conservation and of restoration. Property has doubled in value during that period. A palace on the Grand Canal that could have been bought in 1850 for from eight hundred to a thousand pounds now costs two. Old tumble-down buildings have been made to "look as good as new." This property restoration throughout Venice has been chiefly the work of Jews. They are the richest

merchants in the city, and at the head of the chief business houses. These buy up old houses at a small figure, put them in good order, and let them at rather high rents. The saying is common in Venice that wherever you see a house nicely done up you may be sure that it belongs to a Jew. The other great restorer of property is the Italian Government. As all ecclesiastical property belongs now to the Government, and many churches and similar buildings have been registered national monuments, the State charges itself with their maintenance. This has necessitated much expenditure in the way of restoration. Fifty thousand francs (2,000*l.*) are spent annually upon the conservation and restoration of St. Mark's Church alone. And upon the whole the restorations, whether effected by private citizens, by the Government, or by public corporations, are done in good taste.

To a period of conservation and restoration is now being added one of construction. A lovely Gothic palace in pure style has just been erected on the Grand Canal, opposite the Grand Hotel and near the well-known church of the Madonna della Salute. It is a large palace, for it covers an area of about 1,000 square yards, has a frontage to the Grand Canal of 118 feet, and has cost about 400,000 francs (16,000*l.*). It is true that there is nothing original in its construction and architectural style. But it is something to be able to say that there is nothing base, nothing of the low decadence, nor even of the Renaissance period about it. It is pure Gothic, copied from the best fourteenth-century specimens of that style to be found in Venice. It is approached by a broad flight of steps that dip into the canal, is entered by three large Gothic arches, above which, in its first and second floors, are great Gothic windows of six lights each, divided by handsome marble columns with richly-carved capitals, with foliated lights above them. Other twenty-four windows, arranged in groups to right and left of these beautify the rest of the façade. The angles of the walls and the roof cornice are relieved and adorned by the old Venetian cable and dog-tooth decorations. Balconies with light graceful columns set off still further the beauty of the *piana nobile*, or first floor. It is a palace that even Mr. Ruskin could praise. The whole is the workmanship of Venetians, and reflects much credit on the architect, sculptor, and the able capo-mastro, and indeed on all concerned. Of the workmen I want to say one word. As the columns were fashioned and the capitals carved in a place near to where I lived, I often used to talk to the men, who all day long were there singing at their work. They had long hours, working in the summer from five o'clock till seven, with an interval of from two to three hours in the middle of the day for food and a *siesta*, and they had what we should consider small pay, from two to four francs a day (1*s.* 7*d.* to 3*s.* 2*d.*), yet they were happy and contented, and took a real interest and pride in their work. "The palace will be an honour to Venice," they used to say, "and, you see, we can still do the good sculpture our forefathers did."

There is one drawback to the palace, and that is that whilst beautiful in itself, its position is such that it rather spoils the view of the Grand Canal on the side where it stands. Formerly the height of the houses gradually diminished, and showed towering over them the domes and pinnacles of the great Salute Church; now this palace breaks the symmetry and cuts off the view of the Salute to a large extent.

Visitors to Venice are always interested in the foundations of its houses. How these are formed to support massive buildings rising out of the water is a puzzle. As I saw the foundations of this palace laid, perhaps I may be allowed briefly to describe the process. First, a strong cofferdam was constructed to keep out the water of the canals. Next, into the bottom thus laid bare were driven wooden piles. The work of driving these is one of the unique sights of Venice. Strong men raise with their arms a heavy hammer that slides on an upright beam, and let it fall on the top of the pile. The leader of the gang meantime keeps singing an old Venetian song, to the music of which the hammer is raised and allowed to fall. The work is very deliberate, as two whole lines are sung whilst the hammer is in the air, and other two before it is raised after it has fallen. It looks to be very slow work, but the men continue thus at it many hours without fatigue. The piles used in this case were beams of oak from 12 to 14 feet long, and a little less than 3 feet in circumference. Of these 3,000 were used, which were driven, not close together, but leaving irregular intervals between them. Then into these interstices was poured a mixture of cement and stones and water, which formed a mass, solid as stone, in the course of twenty-four hours. The palace is 70 feet high, and the width of this foundation was 9 feet. On this, to the height of 6 feet or so above the level of high water in the Grand Canal, was raised a massive wall of Istrian stone, gradually diminishing in width. Above this were raised the walls, which are of brick, dipped in a solution the invention of the capo-mastro, Signor Marco Torres, which makes them resist damp and the weather. These brick walls also taper gradually, until at the top they have a width of only 1½ feet. The whole façade thus becomes to a certain extent a great buttress. In the construction of the old palaces no

cement was used, but the piles were driven in one close to another. Had this old method been pursued in this case, instead of 3,000, 15,000 piles would have been used. The church of the Madonna della Salute adjoining stands on not less than one million and a half piles. In the old foundations, too, piles were not of oak, but of poplar, pine and various kinds of wood. Away from air and light they do not readily decay. Whole forests of wood are buried beneath Venice, as every building, with the exception of a few side walls of some, stands on piles. The foundations are the most expensive part of a building in Venice, and in the case of this palace they cost about 65,000 francs (2,400*l.*), those of the façade on the Grand Canal costing 20,000 francs alone (800*l.*). The cost of building space on the Grand Canal is at present about 30 francs (1*l.* 4*s.*) a square yard, but elsewhere in Venice only from 4*s.* to 4*s.* 6*d.* a square yard. Of course there is hardly an inch of clear building ground in Venice (exclusive of garden ground of which there is a very large amount), and as was the case in this building site, inferior or ruined buildings have first of all to be removed. This palace is not yet finished for occupation, and its erection has taken more than a year. I may add that, as in all buildings in Venice, the floors are laid with a kind of concrete peculiar to the city, which consists of cement and marble broken into small pieces, and of different colours. This is afterwards polished and oiled or waxed, when it presents a clear, smooth and solid surface, shining like a mirror, but a little slippery to walk upon. The ceilings are all left unplastered, and show magnificent beams of wood partly carved, from 40 to 60 feet long, cut from the great giant forests of the Dolomite Alps, which are able to supply Venice now, as they have done for hundreds of years back, with timber for her fleets and palaces.

A MANCHESTER MACE.

A DESIGN for a mace, which is to be made for presentation to the Corporation of Manchester, has been prepared by Mr. Walter Crane. According to his description, it is crested with the city crest—the globe and bees. The figure is intended to typify the industrial city of Manchester, and it is enclosed in a letter "M" to make it still further emphatic as the emblem of the Manchester municipality. Below is another globe, symbolical of the world itself. Around it the city motto appears, and the trade of Manchester with all quarters of the earth is symbolised by the beaks of ships (these would be five), the sails of which form the ridges of the mace. Below again, on the bell, are the city shield of arms, alternating with the national arms and emblems. (These might be enamelled in their proper heraldic colours.) Below again is a series of figures under canopies, symbolising the sources of the commonwealth of the city and its prosperity and administration. For instance, one (shown in front) typifies the Ship Canal, pouring a perpetual stream from an urn, which meanders in the form of a ribbon around the stem of the mace to the foot. The other figures may be Labour, Science, Commerce, Liberty, Justice. The fish at the next joint further play on the idea of the connection of Manchester with the ocean, again suggested by the ships sustained by the nereids seated on the sphere which forms the termination of the mace. The mace will be 4 feet long and silver gilt. The subscription rate for the expenses is low in order to enable a large number of the citizens to contribute.

CUBING IN CANADA.*

AN architect often finds it necessary to estimate the cost of a proposed building before more than an outline sketch has been prepared and before specifications have been written.

In such a case he naturally brings to mind a building of the same class which has already been erected, and of which he knows the exact cost. If such a one can be thought of, and if it is of the same general dimensions, he has simply to make allowance for changes that may have taken place in the prices of labour and materials, and has little trouble in arriving at the required estimate. If, however, the building which seems most suitable for the purpose is somewhat larger or smaller than the one proposed, he finds that by taking its cubical bulk or contents and that of the proposed building as a ratio, he may find the proportionate cost with a great deal of certainty, especially if the difference in size is not great. This experience has led to a system, more or less common, of keeping for reference a record of the cost per cubic foot of buildings which have been erected, or upon which tenders have been received, and such a record, although often an imperfect guide, is worth the small amount of trouble required in its preparation, and with the entries made from time to time its value will increase.

* A paper read by Mr. W. R. Gregg at the Annual Convention of the Ontario Association of Architects, and published in the *Canadian Architect*.

Within the past few days I have seen a few of the Toronto architects, and they have kindly compared notes with me upon this subject and contributed some information used in this paper, which is written with the object of leading to a further interchange of ideas in the discussion which should follow.

I would recommend the following simple method of keeping a record of cubic contents and cost, and would say that the information an architect has of this kind from his own buildings is the best for him, as it is probable that no other architect is quite similar in his style of work and finish.

A book or a number of sheets of paper should be ruled in suitable widths for the following columns:—1st, date (year); 2nd, name of building (or owner); 3rd, where erected; 4th, short description; 5th, cubical contents in feet; 6th, cost of building; 7th, cost per cubic foot; 8th, remarks. The kinds of buildings should be classified so that prices of one class may be seen and compared at a glance in one column. Examples were here shown similar to the following:—

[illegible]

In computing the cubical contents the rule most commonly used is to measure the building as a whole or in parts from the bottom of the footings to a point half-way up the slope of roof, this being done in parts where there are different heights of roofs, towers, &c. In measuring brick or stone buildings, light wooden porticoes or verandahs are usually omitted. There should be a uniform system of omitting or including such items as heating, mantels, grates and tiles, electric wiring, or of noting two rates, one omitting and the other including these.

Supposing that cubing our public schools would give nearly uniform results, I saw Mr. C. H. Bishop, the superintendent of Toronto School Buildings, and he kindly made out a list of the cost of twelve buildings recently erected with the rate per cubic foot, and this varied by half and quarter cents all the way from 5 to 7½ cents, the variation not being governed by the number of classrooms. This shows that the system is not perfect and that for very correct results other methods must be used.

I shall close with a list of the most common classes of buildings, giving a price for each per cubic foot, simply as an opinion which may be altered upon further observation. It is intended for Toronto and is probably higher than in other places in Ontario.

Plain stables, brick, not including complete iron fittings	7c.
Plain brick dwellings, detached or semi-detached, pine finish, furnaces and mantels	8c.
Detached brick dwellings with plain stone trimmings, hardwood finish on ground-floor, hot-water heating and mantels	10c.
Detached dwellings, brick or stone, with more elaborate cut stone-work, hardwood finish throughout, best plumbing fixtures, hot water or steam heating, elaborate mantels, electric wiring, &c.	15c.
School houses, brick, including furnace heating	6½c.
Churches, plain brick, furnaces and pews included	7½c.
Churches, stone, steam-heated, including pews and electric wiring	9½c.
Shops, with dwellings over, plain brick	7c.
Foundries or warehouses with earth floor, one storey	3c.
Plain one-storey warehouse, floored	4c.
Wholesale warehouses, five or six storey, brick fronts, with cut stone dressings, heated, office only finished	6½c.
Plain brick office buildings, heated	9½c.
Bank buildings, brick, with cut stone dressings, two fronts (on corner)	20c.
Hospitals, brick, steam heating included	8½c.

Mr. Burke said he was unable to agree with Mr. Gregg's opinion that cubing is not much use, and is rather inclined to be incorrect. He thought in practice it was found to be just as correct as the builder's estimate, and that the very difference in the cubing of schools showed it. Probably the reason for the great margin in the different schools was to be found in the builder's estimates, not in the principle of cubing.

Mr. Bousfield thought another column might with advantage be added to what was already given by Mr. Gregg; that was the cost per head for schools or churches. Hospitals, too, were very often tabulated at so much per bed. All these were important helps for getting at the actual cost of a building, because, as Mr. Gregg had said, every building varies considerably. Hospitals must of necessity vary according to their character, whether for general purposes, for children, or for infectious diseases. All were regulated according to certain

hygienic rules, some requiring more air space than others, and so on. The information that hospitals cost so much per cubic foot gave very little guide to any one else unless it was known what class of hospital it was, and the cost per bed as well as per cubic foot. Then, with regard to bow windows, cupolas and that sort of thing, they were very easily overlooked in estimating by the cubic foot. In carrying out a design such things were frequently added, and they knocked all calculations by the cubic foot on the head, because they were in themselves expensive additions. His experience had been that everything of that kind had to be very carefully calculated.

Mr. Gregg quite agreed with Mr. Bousfield. He thought every oriel window, tower, &c., should be taken. He thought the ideal way of finding the cubic contents was to find out exactly what amount of space taken out of the atmosphere was filled by the building.

Mr. Townsend thought the cubic contents based upon a building of the same sort was far more likely to be right than a builder's estimate. In a case in court not long ago the judge had taken his cubic contents in preference to the builder's estimate. He thought Mr. Gregg's suggestion that architects should confer together on this point a very valuable one, for if they could agree upon some uniform method in their calculations of cubical contents it would be very helpful.

Mr. Jarvis said the class of work an architect did varied so much that the accurate way to find out what your own work would cost was to refer back. Some architects could get work done cheaper than others, who were regarded by builders as pernicketty, and that for that reason charged 30 per cent. more when working under them. Each man, therefore, was the best judge, as to the cubical contents, of the cost.

Mr. Gregg said that was exactly what he had found in comparing notes with a few architects, and it seemed to him that it would be quite impossible to make a table of the cost of buildings in Toronto based on the prices given by a number of architects, and that was why he had closed his paper in the way it did. His object in giving the prices was not as a guide, but merely as a beginning or essay for each class mentioned.

Mr. Gouinlock said he had made a calculation of one or two buildings, and he found only a cent per cubic foot on factory buildings, and half a cent per cubic foot on residences of difference between Mr. Gregg's figures and the cost of work actually done this year.

Mr. Aylsworth interpreted Mr. Gregg's table to be more as a suggestion that each architect might utilise in his own way, and as such he thought it very useful, but he did not think it was adapted to be used as a hard and fast rule. It might, as had been suggested, be used in law courts, but he thought that would depend to a very large extent on the amount of confidence the presiding judge had in the architect's ability. He did not understand it was intended as a rule for all to adopt, but each architect in his own practice could make it very useful and valuable.

The President said there was no question about the value of the method of arriving at an approximation by cubing. He did not think, however, that Mr. Gregg intended the figures he had given to be sent forth for the guidance of architects as an infallible rule. He supposed most of those present used the cubing system more or less, and he thought it was really valuable if used with proper discretion, but it ought to be used with a great deal of care, because it was very easy to get different results from different systems. Each man must work out his own system, and by keeping a record of the cost of his own buildings, he would be enabled to get better results. A point to be borne in mind was that the comparative size of a building made a great difference in regard to the cost, especially in the case of buildings which may be divided into large or small rooms—schools, for example. There would be a great difference between a school divided into rooms holding, say, twenty pupils and one divided into rooms holding fifty. The same would apply to dwellings. He thought the members were very much indebted to Mr. Gregg for his valuable contribution.

THE LATE ALEXANDER GALLETTY.

NOT only Edinburgh but the country in general has sustained a great loss, says the *Scotsman*, in the sudden death of Mr. Alexander Galletly, curator of the Edinburgh Museum of Science and Art, who, although never prominently before the public, has long been recognised as one of the highest authorities in the many branches of knowledge which come under the general term of technology. Born at Perth in 1829 and educated at the grammar school of that town, he served a mason's apprenticeship under his father, who carried on a considerable business as a builder. As a young man he came to Edinburgh, where he was employed for some time in the building of Donaldson's Hospital. He afterwards entered the service of the Shotts Iron Company, in Leith Walk, in the capacity of accountant and book-keeper. While thus busily employed at his daily work he seized every opportunity of

extending his knowledge and developing the talents with which he was well endowed. In this respect and in many others he bore a strong resemblance to Hugh Miller, whose conspicuous example under very similar outward conditions had, in all probability, a powerful influence on his mind. He was an assiduous and very successful pupil in the school of art of the Watt Institution (now so happily developed into the Heriot-Watt College), and became a skilful draughtsman. This naturally led him to take a special interest in other forms of art, in some of which, more especially in the industrial, he soon became an expert. From its first inception as an industrial museum by the late Professor George Wilson in 1855, Mr. Galletly has held a prominent position in the Edinburgh Museum of Science and Art, where his extensive knowledge, varied acquirements, persevering energy and entire devotion to his duties have been of incalculable benefit to the cause of technical education as affected by technical collections of specimens. Besides discharging his functions in the museum, Mr. Galletly found time for a good deal of miscellaneous literary work on subjects connected with his department. Thus he was a valued contributor to "Chambers's Encyclopædia," both in its first and in its recently completed editions. Probably no other contributor wrote on subjects so various, and yet all requiring special knowledge. The range of his information was truly encyclopædic in all that concerned manufacturing industries in almost every aspect—botanical, zoological, chemical and economical, as well as technical. And in many departments of art and of archæology his judgment was swift and cultured. As a writer he amassed his facts with skill and caution, and verified them with conscientious care; he was orderly and luminous in his statement, and had free command of a direct, simple and readable style. Mr. Galletly had just started on a long tour in England, undertaken in continuation of a similar journey last year for the purpose of identifying the casts of architectural details deposited in the museum, which had been taken from old English churches by Sir Charles Barry for the use of the workmen engaged in the decorative work of the present Houses of Parliament. In the course of his tour he had reached Nantwich, in Cheshire, where he was found dead in his bed, the cause in all probability being heart disease, from which he had suffered for some years, although, with characteristic reticence, he rarely referred to the fact of his doing so.



"The Architecture of the Renaissance in England."

SIR,—As a student, I never see the above advertisement of this beautiful book of picturesque architecture without thinking there is something wrong in the title. If I ask myself the question, "Renaissance of what in England?" I fail to get an answer, because the neo-Gothic, as it appears to me, is the only true Renaissance in this country—perhaps destined to develop into the national style of England.

The Italian Renaissance—the style referred to in the title—was not the parent of "the decadence" in England, which is the style illustrated, for Alberti, Brunelleschi, Serlio, Bramante, Palladio, Michel Angelo and others had long been dead before the architectural eccentricities of Bernini, Fontana or Borromini appeared. Unfortunately, it seems to have been these latter and not the former that originated the pretty English buildings of the seventeenth and eighteenth century. John Thorpe and Inigo Jones, or whoever introduced here curled pediments and other architectural eccentricities, must apparently have gone no farther in their travels than Venice, and so lost the advantage of seeing the great and noble works of the true Renaissance in Rome by the above first-named true and accomplished architects.

The title "Architecture of the Decadence in England" is not, perhaps, quite so dignified as that adopted; but it would be correct, and it would not have been damaging to a book that has done such good service in illustrating the picturesque buildings of the period.

But perhaps if Mr. Gotch should see this note he will be able to justify the title and enlighten a student of a somewhat critical turn of mind.

Sydenham.

A. A.

The Officers of the Devon and Exeter Architectural Society just elected are:—President, Mr. James Jerman; vice-president, Mr. C. E. Ware; council, Messrs. F. J. Commin, J. Crocker, J. M. Pinn and A. Thorne; hon. treasurer, Mr. C. J. Tait; hon. secretary, Mr. E. G. Warren.

SCHOOL BUILDINGS.

Heywood.—The foundation-stone of the Heywood Technical School has been laid. The building is practically three storeys in height. The basement will contain weaving and spinning room (48 feet by 30 feet), weaving classroom (18 feet by 19 feet), engineering workshop (29 feet by 17 feet), carpenters' workshop (31 feet by 21 feet), with all necessary store-rooms, lavatories, &c., engine-rooms for driving the machinery, and is complete with well-lighted corridors. The different rooms will be well ventilated and lighted, having spacious areas all round the building. The ground floor will be well laid out for scientific purposes, having science lecture theatre (60 feet by 30 feet), science drawing-room (32 feet by 21 feet), three classrooms (21 feet by 16 feet, 21 feet by 12 feet, and 20 feet by 18 feet respectively), with accommodation for the committee, secretary, &c., and also spacious staircases, lavatories, &c. The first floor will contain elementary art room (48 feet by 30 feet) and advanced art (30 feet by 30 feet), chemical lecture-room (23 feet by 22 feet), chemical laboratory (35 feet by 22 feet), store-room (22 feet by 11½ feet), with the usual preparation-room, balance-room, &c., and a well-lighted corridor, spacious staircases, lavatories, &c. The main fronts will be faced with stock bricks from Mr. Henry Dennis, of Ruabon, North Wales, with stone dressings, and the roof will be covered with Westmoreland slates and the areas enclosed with an ornamental iron railing. The heating and ventilation will be by Messrs. Pickup & Co., of Bury. The architects of the building are Messrs. Woodhouse & Willoughby, King Street, Manchester, and Stockport, who obtained the commission in "open" competition. The internal flooring generally is of carefully selected pitch-pine.

GENERAL.

The A.A. Camera Club will hold a meeting on Wednesday, the 14th inst., when Mr. R. Elsey Smith gives an address, entitled "My Travels in Greece and Cyprus," which will be illustrated by lantern slides.

Mr. P. Turner, of Mason College, Birmingham, has been appointed director of the technical instruction committee of the Staffordshire County Council.

Mr. E. T. Felgate gave a lecture at the meeting of the York Architectural Society, entitled "Chicago Exhibition," descriptive of the architecture of the buildings and the various departments, &c., of this vast undertaking, Mr. J. Lane presiding.

The City Commission of Sewers on Tuesday announced that they had considered the complaints of citizens and others, alleging that a district surveyor had charged fees in respect of sky-signs which were merely hanging advertisements over footways. The committee, having viewed the so-called signs, reported that they could not be so designated, and they recommended that the London County Council should be so informed, and that the surveyor should be ordered to return the fees.

Mr. Waterhouse, B.A., has been appointed architect for the new building of the British Institute of Preventive Medicine.

The Rev. G. F. Browne, D.C.L., F.S.A., canon of St. Paul's, will read a paper before the Society of Architects, on Tuesday next, upon "Early Christian Art in England," which will be illustrated with the aid of a large number of slides.

The Spring Art Exhibition of the Southport Corporation opened on Monday to the general public.

Mr. Thomas Howdill, architect, Leeds, has removed his offices to 24 Albion Street, Leeds. Having taken into partnership his son, Mr. Charles B. Howdill, the practice will be conducted under the title of Howdill & Howdill, architects, &c.

At the Annual Meeting of the Governors of the West London Hospital it was stated that competitive plans for the enlargement had been received from three architects, and the designs sent in by Messrs. Wm. Harvey & G. H. Hunt, of 7 Whitehall Place, S.W., had been accepted. The plans had been so arranged that sections could be erected as funds permitted, and the Board considered that the pavilion block in Wolverton Gardens, providing sixty additional beds, should be the first portion taken in hand. The estimated cost of this, together with the connecting corridors, was about 15,000*l*.

Mr. H. Saxon Snell has resigned the appointment of architect to the Holborn Board of Guardians, which he has held for the last twenty-four years, as he is retiring from the firm of Snell & Sons.

The Aberdeen Artists' Society will hold an exhibition in the Corporation Galleries during September and the three following months.

The Cheltenham Town Council have decided to raise the salary of Mr. J. Hall, borough surveyor, from 550*l*. to 650*l*. per annum.

The Architect.

THE WEEK.

At the annual meeting of the Associated Chambers of Commerce on Wednesday the following motion was unanimously adopted:—"That the Board of Trade be requested to initiate legislation for altering the laws regulating registered designs, so as (1) to permit search on the premises of persons reasonably suspected of making or selling articles to which a registered design is applied, against the consent of the registered proprietor; (2) to penalise persons exhibiting like articles for sale who, on demand by the registered proprietor, refuse to give all the information in their power with respect to the persons from whom they obtained such articles; (3) to provide for the early and compulsory reference of questions of infringement or novelty to the award of experts in the class of goods concerned; (4) to make importers or agents for the sale in this country of piracies made abroad liable to penalties, as if they had applied, or caused to be applied, the pirated design; and (5) to enlarge the limitation imposed by the Patent Designs and Trade Marks Acts, 1888, on penalties recoverable." It is time that legislation of the kind should be enforced, for there is no doubt that piracy is carried on to a scandalous extent, and it is not to be excused by saying it is only an incident in commercial competition.

At the meeting of the London Council on Wednesday it was agreed:—"(a) That the Council do spend a sum not exceeding 500*l.*, as a preliminary step towards the preparation of a ground plan of London showing the various freehold owners. (b) That the statistical officer and valuer be instructed, under the direction of the committee, to provide maps and other documents that may be required, and to tabulate the necessary statistics, with such assistance as the Council may hereafter sanction. (c) That the valuer be instructed to place himself in communication with the Ecclesiastical Commissioners, the Commissioners of Woods and Forests, and other Government authorities and landowners, with a view to obtaining plans and information which would enable him to lay down on a map the property in London belonging to them. (d) That the local authorities be requested to allow the valuer gratuitous access to any parish or local maps and any local records which might assist him in the preparation of the plan. (e) That the Treasury be requested to allow the Council to inspect and take extracts from the Middlesex register for this purpose without payment of the usual fees, as from time to time may be required; and also to allow the Council to have the services of an officer of that department conditionally on its undertaking to pay a share of such officer's salary."

A MEETING of the West Riding Council was held on Wednesday at Wakefield, when the following motion was brought forward:—"That the tender of Messrs. ARMITAGE & HODGSON, contractors, Leeds, amounting to 72,506*l.*, be accepted for the works set out in the general specification, comprising a council chamber or hall and offices for the administrative and other work or business of the County Council, together with caretaker's quarters, and including the fitting up of the same with heating or warming and ventilating apparatus, and that the West Riding solicitor be instructed to prepare the necessary contract, and that the common seal of the Council be affixed thereto." Mr. BENSON FORD said that the reason given at first for the selection of Wakefield was that the cost of buildings there would be 36,000*l.*, while at Leeds it would be 72,000*l.* He wished to know, if the figures were not fallacious, why the cost at Wakefield had increased to double the assumed amount. Alderman BRIGG said that it was originally proposed to expend only 10,000*l.* on improving the existing buildings at Wakefield. He therefore proposed, as an amendment, that the resolution should be sent back for further consideration. The explanation offered was that the sum that was first mentioned was based on a rough estimate of the surveyor. The amendment was carried by a large majority. It is to be hoped that no diplomatic action between the committee and their friends

will minimise the effect of the vote. The West Riding case is only one among several in which estimates of cost are put forward as a matter of form and without any regard to the cost of work. Afterwards, when tenders of larger amount are sent, the architects are blamed for incompetence to meet the economical desires of the authorities. Leeds is the proper site for a council hall, and the opportunity should be seized to abandon the Wakefield scheme without delay.

THE city surveyor of Sheffield, like the majority of gentlemen who hold similar appointments, has, in the engineering work entrusted to him, more than is sufficient to tax his abilities. The Sheffield City Council have contemplated an increase of his duties, for they appointed a special committee to report whether he could not likewise undertake the architectural work of the city. The Council of the Sheffield Society of Architects accordingly sent a remonstrance, in which it was stated:—"That the city surveyor has daily duties so important and multifarious that he cannot have the time at his disposal for the quiet conception and elaboration of the design of public buildings, nor yet for the constant general superintendence of their construction, so that to place such work in his department will necessitate the deputing of it to assistants. That to depute such work to assistants is not likely to be so satisfactory in any respect as to commission architects of ability and experience." After the communication was received the following resolutions were passed by the special committee of the City Council:—"That the members of this committee, having fully considered the questions referred to them, are of opinion that the city surveyor cannot reasonably be expected to undertake the preparation of the necessary plans and detailed drawings for the proposed additions to the Court House." "That with regard to the architectural work other than the additions to the Court House now in the office of the city surveyor, this committee is of opinion that he and his staff will be able efficiently to carry out the same, and also that a thorough reorganisation of the staff should be made when the department is removed to its offices at the town hall." This result is not so satisfactory as was to be expected, for it is no more than a compromise. Evidently it is contemplated to engage one or more architectural assistants for the surveyor, and with their aid Sheffield is to be beautified. Whatever may be the utility of Mr. RUSKIN's museum, it has not induced the City Council to appreciate the ability of local architects.

It is a humiliation for the Cardiff Town Council to acknowledge that a great many builders in the town treat the building by-laws with absolute contempt, and erect buildings in utter disregard of the Council's authority. In such cases the builders are not entirely to blame, for if the procedure is lax, and the operations of a Council are tedious, it is not to be expected that builders and clients will lose time in awaiting the approval of plans. It is far more economical to pay the heaviest fine that can be imposed. The Cardiff Council a few days ago summoned the proprietor of a steam joinery works for erecting a wooden shed without obtaining their approval. A structure of the kind near a railway siding is a public danger, and the Council were justified in asking for a penalty. The defendant, it appears, had refused to submit plans, but in the police court it was stated on his behalf that the error arose out of the neglect of an architect who had been requested to prepare the plans. The excuse did not satisfy the magistrates, and the majesty of the Council was vindicated by the infliction of a fine.

DURING the next fortnight competitions between workmen engaged in the following building trades—bricklaying, carpentry, joinery, masonry, plumbing, plastering, tile-laying, &c.—will be held at the National Building Exhibition in the Agricultural Hall, Islington, under the direction of a special committee. Any workman can take part in it without entrance fee or other charge. Competent judges will examine the works, and on their awards gold, silver and bronze medals will be awarded in each department. The project is novel and must enhance the interest of the exhibition.

BUILDINGS AND EARTHQUAKES IN JAPAN.

IS it possible to construct buildings that can withstand earthquakes in a country like Japan, where the seismic convulsions appear to have a certain amount of measure? That is a question which is now engaging the attention of the Government as well as the followers of science, native as well as foreign, in Japan. The earthquakes of 1889 and 1891 have unhappily afforded materials for the study of the question. Buildings that were erected by foreigners as well as all classes of native buildings are evidence of the force which was exerted. In some cases there was destruction, in others more or less injury. It is reasonable then to suppose that from a close examination of the phenomena some conclusions could be drawn respecting the materials and the mode of construction which were least affected during the disturbances. The duty of reporting on the subject appears to have been entrusted to Mr. JOSIAH CONDER, and he has contributed over ninety pages of his "Notes" to the *Seismological Journal of Japan*. His object is, he tells us, "to record fairly without prejudice to any style the effects upon all classes of structures," and therefore "care has been taken to avoid all exaggeration and sensational description, which are perhaps tempting instruments for arousing public attention to scientific investigation."

Mr. CONDER seems to have jotted down his observations in the order in which they arose. The principal towns in which his investigations were conducted are Nagoya, Gifu and Osaka, all on the south coast of the main island. Between those places he was also enabled to observe the effects of the earthquake on farmhouses and other detached buildings.

On his journey to Nagoya, Mr. CONDER tells us he perceived evidence of the spent force of the movement in plaster and ridge tiles which had been cast down. It does not require immense power to accomplish an amount of injury, for "the tiles of all Japanese roofs are simply laid upon clay spread over the roof with a slight lap; the ridges consist of layers of tiles also pointed with clay, and in some cases externally pointed with lime mortar." An old farmhouse was found in a collapsed state. Religious people would probably believe a miracle was performed when they saw an image of the god KWANNON standing unscathed on a pinnacle of a rock while the piers of a railway bridge were cracked.

Nagoya, which has become an important town under the new condition of affairs, both in the buildings that were European in style and those after ancient models, presented signs of inability to resist the earth movements. Before the catastrophe Nagoya displayed many of the characteristics of the most ancient towns. Professor MORSE selects it as an example of those which are remarkable for the uniformity of the level of the roofs as for the antiquity of some of the buildings. From Mr. CONDER's reports it is evident that the low native buildings have advantages when there are terrestrial disturbances. A large Japanese hotel was seriously damaged, but it was mainly owing to "the fall of the upper walls of the adjoining post and telegraph office." The gateway, however, was in foreign style, and the tops of the pillars, which bore lamps, were turned round. The Hongwanji Temple, which is constructed with massive timbers, was saved, "even the heavy ridge tiles and terra-cotta terminals of the roof seemed unchanged." But the adjoining buildings, which were of a lighter form, were damaged. Another temple that was two centuries old lost some tiles and plastering. The two Japanese theatres also suffered, but on the whole the native structures in Nagoya and the neighbourhood were let off easily. Mr. CONDER arrives at the following conclusions about the behaviour of the buildings:—

It seemed an indisputable fact that the monumental class of wooden buildings of pure Japanese construction showed remarkable powers of resistance to the earthquake. Such damage as had occurred to them was the falling of plaster-work and tiles, and in some cases a sliding and twisting of the supporting pillars, which had in two or three examples shifted the structure off the isolated stone supports, but without throwing it perceptibly out of the perpendicular. Lighter buildings annexed to these heavy structures had invariably been damaged by the oscillation of the heavier mass. The roofs in all cases showed wonderful stiffness, and in many instances not a tile was shaken off. Tiles, where used in combination with thatch, had been thrown off. On the other hand, the ordinary Japanese city buildings, and a few of the older structures of better class, had yielded like a

broken chair, collapsing when not held up by adjoining structures. The same principles and methods of construction were followed in these ordinary buildings as in the large temples; the weight, size of timbers, and consequent strength and stiffness of joints in the latter alone distinguishing them. It appeared to the writer, therefore, that the advantage was not one of method of construction, but rather one of strength and mass in the heavier structures. The scantlings and mass employed in these monumental structures it was impossible to apply to ordinary structures, both for reasons of utility and economy. Also it must be remembered, in comparing them with other classes of buildings, that there existed no monumentally solid structures in masonry or brickwork to compare with these temples, such brick buildings as had been examined being mostly of the speculative or commercial class, and of poor construction.

The new style of buildings were less fortunate. In the brick walls of the post and telegraph office, which was erected four years before the earthquake, the mortar was in some places forced out of the joints, and in consequence walls settled or tumbled, bringing other parts to ruin. The building was not creditable to the workmen. In the garrison office, which was substantially built, all the walls, with the exception of triangular pediments, remained standing. The powder magazine was constructed under the direction of the Military Department. In the plinth notched stones were used, the idea being probably derived from some old account of the Eddystone Lighthouse. Mr. CONDER considers the notching is only an amateurish arrangement, but as the building escaped, it is claimed that the notching was devised to meet shocks. He believes that "the notching of plinth stones might form a most useful expedient against the effects of earthquake in the case of stone bases to light wooden buildings, when a sliding between plinth stones could take place, but in a heavy brick building the advantage does not easily appear." The military hospital, another modern building, displayed a rotation of the four corner-stones of the upper plinth course. The castle buildings suggested the advantage of having roofs trussed in every direction, so that none could act independently. Mr. CONDER also infers that "whatever conclusions might be reached with regard to brick buildings in general, magazines and fireproof stores, not used as dwellings and of no great height, were far less liable to injury if built in brick or even stone than the ordinary Japanese mud and plaster storehouse." Height has much to do with risk, for "nowhere up to the present had low brick structures been found seriously injured." The Japanese considered that next to their own castles and superior buildings the wooden buildings of foreign design offered most resistance.

The little town of Kasamatsu was found to be a heap of ruins. What the earthquake spared was overcome by the fires which followed, and which seem to be a common calamity on such occasions. At Kano most of the houses had fallen in, and those which remained were distorted. Mr. CONDER found that one gateway having the side pillars tied by diagonals had fallen, but the framework remained uninjured. As he says, "This could hardly have happened if the structure had in some way been fixed to the ground at its base; the loose isolated supports of a Japanese building here showed a decided advantage."

In the Gifu Gymnasium, Mr. CONDER found another example of the security which is offered by trussing a roof in more than one direction. It measured 35 feet by 50 feet, and remained intact. What was curious was that roofs of a cheaper and lighter kind, but in which the principle was observed, when they fell were not dislocated, and in consequence could be used as huts or places of refuge by the inhabitants. Mr. CONDER's remarks on the subject are worth reprinting:—

The writer has elsewhere had occasion to draw attention to the utility of this principle of double trussing applied to modern roofs for structures in earthquake countries, and which since the fatal earthquake of 1891 he has adapted to several important buildings. He does not by any means desire to advocate the copying of Japanese roof construction, an interpretation which one critic has chosen to put upon his observations. Such roofs are in many respects eminently unscientific, unnecessarily heavy and wasteful in material, and they at the same time require numerous internal supports. But in the one particular of being equally stiff in both directions they present an important advantage. And this solidity and stiffness can also be given to modern structures executed in a more scientific and economical manner. The problem becomes a somewhat complicated one in dealing with roofs of buildings of irregular and compound plan. The plain square or oblong plan invariably given to Japanese buildings is very favourable to such treatment; but the principle is capable of application more or less to any plan.

To no part of a building did an architect perhaps give less attention than to the roof construction. The engineer, on account chiefly of the large spans and the iron construction with which he had mainly to deal, calculated and considered carefully every part of the surface of his structure. It was the common practice of architects to provide a general roof-plan showing the positions of trusses and to supply only one or two details of individual trusses. These trusses were probably designed and calculated with considerable care, but in framing the whole roof together on a complicated plan, half trusses, three-quarter trusses, diagonal trusses and numerous unforeseen struttings, supports and modifications were required which were left mostly to the contractor or clerk of works to devise. The consequence was that, though the roof truss alone might be a very strong and scientific structure, the roof as a mass was often a very weak and unscientific one. This was not attended with any serious results where simple weight and stability were concerned; but in case of structures liable to be violently lifted and shaken, it became most important to consider the roof as a whole. It should as near as possible approach the form of a hollow pyramid, equally unable to yield or move in either direction.

The severity of the shocks in Ogaki was evident when it was seen that not more than thirty houses in a damaged state survived out of eight thousand. In the fire which followed the earthquake many of the inhabitants were consumed. Where the destruction was so general it appears that "certain old and rotten wooden fences curiously enough remained in position."

Osaka, being one of the most important of the capitals, obtained much attention from Mr. CONDER, for there he could make a more exact comparison of the relative advantages of materials and forms of construction than in Nagoya or the small towns. The premises of the Electric Lighting Company suffered considerable damage, which Mr. CONDER ascribes to the bricks not being properly soaked, and the vertical joints being unfilled with mortar. There is a great cotton mill in Osaka which was erected from English plans under an English clerk of works. It had a height of 67 feet to the cornice, with a tower that rose 20 feet higher, and was accepted as a model in the district. It is satisfactory to learn that "the building, although of unprecedented height for Japan, had suffered comparatively little damage from the earthquake, and the writer can but attribute this mainly to its solid, careful and conscientious construction. The light flat roof, having a skeleton of iron beams and acting as a fixed lid tying the top of the building, probably presented superior advantages to the ordinary sloping roof of heavy timber and of more or less independent trusses. The network of iron beams at the different floors, though not anchored, acted as important horizontal ties to the walls, without creating the large cavities occasioned by the use of enormous wooden beams; and the brick arches and concrete over these prevented them moving independently and battering the walls. Though the window openings were of large area compared with the wall spaces, a great thickness had been given to the intermediate piers." Mr. CONDER, however, believes that the tower was a source of weakness, and that if, for the flat arches to the openings, semicircular or pointed arches had been substituted, the building would have gained in strength. The Naniwa Mill was less spared. The floors were overweighted and failed, and a large part of the walls succumbed. The span was 120 feet, and there was a length of external wall without cross walls reaching 300 feet. In this case also the bricklaying was defective. Mr. CONDER records that "the vertical sides of the bricks were perfectly clean, not being even stained by mortar, which had been apparently smeared only on the beds. Even the mortar between the beds had no adhesion to the bricks, suggesting that they had been laid dry, a habit, as is well known to those engaged in practical work, most difficult to eradicate from the Japanese bricklayer, who has a most obstinate liking for liquid mortar and dry bricks. But the mortar itself was seriously defective; not only had it no adhesion to the bricks, but it had no cohesion in itself, and was easily reduced to powder with the fingers."

While large mills which represented the expenditure of much money fell asunder, it was curious to find a building that was cheaply constructed to hold a panorama cited as a model. The circular plan, the light roof, and the continuous wall-plate were all elements of security. In that case, as in others, the flimsiness was advantageous, while the Arsenal and other important Government buildings in Osaka were saved by massiveness of the parts. When experience is favourable to the two extremes of construction,

it is difficult to lay down a universal law on the subject. Mr. CONDER maintains, from what he saw, that there can be "no satisfactory compromise between strengthened connection and complete isolation." The parts of a building must either be independent or tied together in the most effective way.

The Japanese are dexterous and so much is produced in the country of a fragile kind, it is not surprising if they do not appreciate the firmness which is expected to be a quality in European construction. By nature and circumstances the people have a tendency to outdo the western jerry builder. Mr. CONDER laments the increase of audacity in structural work. At first mills of the English type were strange, and the owners and builders were forced to be careful. But having become familiar with the arrangements, they go on imitating "but thinning the walls, though at the same time increasing the spans, substituting wooden floors for iron ones, and wooden tile-covered roofs for light iron coverings; widening windows and decreasing piers; dispensing with cement; mixing mortar by hand instead of by machinery; and employing the services of assistants as superintendents. And lastly, we find the general contract system introduced, the contractors being mostly speculators of no experience, possessing no machinery, plant or special facilities, and the machinist in charge of the mill being the only supervising 'architect.'" There are English precedents for work that is as flimsy, but in this country there are no earthquake tests. The Japanese may argue that as their buildings are always liable to casualties it is not economical to expend more money on them than is necessary. In factories the people consider that the chimneys are the characteristic, the most essential part, and they must see, as well as Mr. CONDER, that "in the matter of factory chimneys, and also in the ordinary chimneys of buildings, the best and strongest class of structures seemed to have fared scarcely any better than those of inferior construction." As long as there are proofs of that sort forthcoming, there is some excuse for the Japanese if they hesitate to believe in the virtues of excessive strength. At the same time, it must be allowed that repeated experience of earthquakes has not enabled the Japanese to evolve a system of construction that accommodates itself to the strains which arise when the earth is disturbed. It may be assumed that on the ground, as on the sea, there is a chance for buoyancy when there are extraordinary agitations, and Mr. CONDER has mentioned many cases where things which were not firm seemed to be most triumphant. But it does not appear that under the fierce tests of 1891, the supremacy of the native system was demonstrated. Mr. CONDER fairly summarises the results in the following passage:—

The writer of the present record desires as much as possible to avoid all controversial matters, but he feels bound to state as his opinion that there is nothing in the character of the wall-framing or of the isolated foundations of purely Japanese structures which gives them any seismic advantage over European methods of framing and foundation. And this is amply and repeatedly proved by the effects of the earthquake of 1891. The advantages which such buildings may possess are entirely those of suitability to custom and climate. The instability of the parallelogram form of structure, liable as it is to rhomboidal change or displacement, is repeatedly observable, as may at any time be seen in a broken or creaky chair; and Japanese wall-framing consists only of parallelograms. The same applies to Japanese roof-framing; but, as already pointed out, such roofs have another compensating advantage, namely, that of transverse framing, which gives them additional unity and stiffness. The abstract theory that looseness of joints and liberty of movement is an advantage, that the convulsive forces of nature are so irresistible that they cannot be combated by weight and stiffness, and must, on the contrary, be met and neutralised by pliability, is a very plausible one, and one which is possibly to some extent applicable in practice. But if such looseness and pliability is unavoidably followed by breakage and disintegration, or by a change of form which destroys equilibrium and produces collapse, it is eminently useless and destructive. Foreign-framed wooden structures, and even exceptional Japanese structures containing triangular arrangements of struts and braces, had, on the other hand, everywhere preserved their forms.

It is fortunate for Japan that the subject can be investigated with the impartiality which is shown by Mr. CONDER. To make buildings earthquake-proof is not to be done without many trials, but the leading members of the Seismological Society appear to be working towards that end in a manner that is justified by the whole history of modern science.

THE NATIONAL BUILDING EXHIBITION.

THE Building Exhibition, which opens to-day in the Agricultural Hall, Islington, will, it is hoped, exert an educational influence in elevating the public taste. In order to supplement the lessons which can be derived from the sight of the objects, it has been decided to give a series of lectures and to institute competitions among artisans. The committee charged with making the preliminary arrangements have prepared the following report:—

The various matters connected with the exhibition that were referred to your Sub-Council, together with such arrangements that would be likely to conduce to the interest and success of the enterprise, have been carefully dealt with by us, and we are glad to report that, as far as it is possible to predicate, the character of the exhibition and its results will be alike creditable to the Consultative Council and of value to the important industries represented.

We learn from the promoters that, notwithstanding the disfavour with which past building exhibitions have been regarded, manufacturers have this year sent up exhibits who have not done so for many years past, and the promises for next year's exhibition assure even greater success.

Your Sub-Council have given considerable thought and time to the arrangements for good practical and entertaining lectures, as well as for the reading and discussion of important papers, namely:—

Monday, March 19, 3.30, H. W. Burrows, A.R.I.B.A., "Selection of Building Stone." Wednesday, March 21, 3.30, Sir Douglas Galton, K.C.B., J.P., D.L., "On Warming and Ventilating." Wednesday, March 21, 8.0, F. R. Farrow, F.R.I.B.A., "Picturesque Buildings," illustrated with lantern views. Saturday, March 24, 3.30, Professor Norman, "Chemistry of Clays and Marls." Saturday, March 24, 8.0, H. H. Collins, F.R.I.B.A., F.S.I., "Principles of Sanitary Building and Councils of Sanitary Institute of Great Britain," illustrated with models and diagrams. Wednesday, March 28, 3.30, Thos. de Courcy Meade, M.Inst.C.E., "On the advantages of Technical Museums in advancing Sanitation." Wednesday, March 28, 8.0, Professor Banister Fletcher, J.P., D.L., F.R.I.B.A., "Architecture: its Civic and Commercial Value," illustrated with large diagrams, views and photographs.

It has been thought desirable that there should be competitive work by artisans whilst the exhibition is open, bricklayers, carpenters and other craftsmen carrying out some set job in the presence of the company, the best workman being awarded a distinctive medal, to be given on a subsequent occasion. This competition, it is hoped, will tend to the encouragement of good workmanship on the part of mechanics in the building trades, and it is possible that the start thus given by ourselves may become at least an annual demonstration in the encouragement of good skilful handicraft.

The expenses connected with these additional features are necessarily somewhat heavy, but the promoters, regarding them as likely to put the exhibition on a sound permanent basis, have agreed to find the requisite money.

A difficulty having arisen in securing the presence of their Royal Highnesses the Duke and Duchess of York to inaugurate the exhibition, it was decided this year to open it without ceremony, but we have reason to anticipate the honour of a visit from one or more members of the Royal Family.

With a view to secure the attendance of professional gentlemen, about 5,000 special cards of invitation have been sent out in town and the country. All such invited guests will find at their disposal a reception-room in the central avenue, which will be fitted up and tastefully furnished by the courtesy of Messrs. Turner, Lord & Co., of Mount Street, Grosvenor Square. It is also an interesting fact that, by the gracious command of H.R.H. the Princess Christian, wall-hangings and curtains will be lent for this room by the Royal School of Art Needlework. The managing director, Mr. Larkins, has considerably allotted this site to the Council free of charge.

Your Sub-Council, under the presidency and with the indefatigable work of their chairman, Professor Banister Fletcher, having thus made much effort to secure success and to carry out the views of the Consultative Council, feel that they may confidently count upon the continued co-operation and support of the whole of their colleagues in the important work of raising the tone of our annual exhibition.

had only managed to secure one of the changes in the conditions which they desired, but that was an important one. The Town Council had agreed to appoint an assessor to adjudicate upon the designs. The reply, however, containing that information had only been received a few days ago, and unfortunately it had been delayed so late that its practical value was very much lessened.

The President said he thought they need not regret that the Council of the Association took this matter up. In securing the appointment of a professional assessor they had at least made an appreciable improvement on these conditions, and if the thing had not been done in a very gracious manner, perhaps it was all they might expect. Proceeding to refer to the deputation from the Council to the Edinburgh Town Council on the question of the proposed reconstruction of the North Bridge, the President said there had not been time to consult the Association, but the Council felt that it was of such importance that they were justified in moving in the matter, and they had no doubt that what they did would be thoroughly endorsed by all the members of the Association. The deputation was received most kindly, and he thought they might say from what they saw and heard that their remarks carried a certain amount of weight.

Mr. Thos. A. Croal then read a paper entitled, "The Man in the Street: a Non-professional View of Architecture," in the course of which he discoursed on various features in architecture as they impressed a mind not learned in the art. He criticised the plan, once so largely in use in Edinburgh, of building up streets on cellars, so as to create underground apartments. He commented upon the value of the roof in design, drawing instances from both Edinburgh and London; and dealing with the internal architectural arrangements of dwelling-houses, he put in a plea for variety in the shape of the rooms, and asked why all the rooms should be shaped like mere rectangular boxes? Discussing questions of church architecture, he dwelt upon the need for plenty of light to suit the modern requirements of worship. In conclusion he spoke of the reconstruction of the North Bridge, and expressed the hope that the new bridge would not be put in the hands of a lighthouse engineer. Were the members prepared to submit to the half-century-old gibe of the Camden Society, that "if we must be utilitarians we shall never be good architects"? He was persuaded the Association would not, and that if only the opportunity were offered there would be found architects who could so apply old principles to new needs that a bridge at once strong and stately, graceful and artistic—and perhaps economical besides—would be provided to displace the ugliness of to-day, and to adorn the grand site the bridge occupied.

THE SCHOOL OF APPLIED ART, EDINBURGH.

UNDER the auspices of the Board of Manufactures the drawings and other work of the students in the School of Applied Art are on exhibition for a limited period in one of the upper halls of the National Portrait Gallery, Queen Street. It had been intended, says the *Scotsman*, that the exhibition should only be open to the students themselves, so that they might see each other's work, but afterwards it was thought desirable that the public should have an opportunity of informing themselves of the good which is being done among the young architects and clever artisans of the city under this new educational scheme, which is now in its second session. The drawings on exhibition are the fruit of the work of the first session, and are of a very creditable character. There are in attendance sixty-five students—quite as many as the premises at command of the committee can accommodate—and in the classes, which are held four times a week in the morning and in the evening, an attempt is made to develop the individuality of the students along practical lines. Dr. Rowand Anderson is superintendent of the classes, and there are four teachers, Mr. Frank Simon and Mr. George Watson for architectural work, Mr. R. Burns for colour, and Mr. Birnie Rhind, A.R.S.A., for modelling. The drawings now shown illustrate the thorough character of the work performed in the school. One of the first things done is to give the students an accurate practical knowledge of the history of art, and in accordance with this plan there are shown what may be called concrete as well as analytical drawings of the distinguishing features of the several orders of Classic architecture. They have also been instructed regarding the measured shadows which pillars and projections throw, and have represented these in their drawings. Arcadings in perspective and examples of the best Classic architecture, many showing beautiful draughtsmanship, are on exhibition—the drawings in this section suggesting an aptitude by the students for the work in which they have been engaged. The studies in colour are also exceedingly good. For this part of the work the students have had the advantage of studying a number of Chinese and Japanese glazes, lent by Dr. Rowand Anderson, and the school had also acquired by purchase and by gift a fair collection of coloured stuffs, which are used as foregrounds and backgrounds

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the last meeting of the Edinburgh Architectural Association, Mr. W. W. Robertson, president, before the proceedings commenced, referred in sympathetic terms to the death of two members of the Association, Mr. Heiton, Perth, and Mr. Simpson, Leith.

Mr. Aitken reported as to the correspondence between the Council and the Town Council of Kirkcaldy with reference to the competition for the design of the Beveridge Hall. The latter body had now given their final reply. The Association

for these studies. This instruction in colour will afterwards be turned to account in the harmonious and artistic designing of wall decorations. Another set of drawings shows the results of the Saturday afternoon excursions which the students under proper guidance have made to places of interest in the vicinity of the city. These illustrate also the varied tastes of the students. One has drawn some architectural bit that has taken his fancy, another a fine plaster ceiling, a third an artistic piece of furniture, a fourth a pretty piece of ironwork, and so on, each being encouraged to sketch what is most along the line of his own daily work. Another set of drawings represents the work of the prize-takers during their holidays. A fee of 10s. a session is charged from each student, but the aggregate sum received, and a good deal more, is returned to the students in the shape of prizes. All prizes are in money. Fifty-four pounds was distributed last year in sums of 12. to 52., and each student is required to spend the money in improving his art education, and to send the drawings or other work to the secretary to show how it has been utilised. In these drawings by prizemen the same diversity of taste has been displayed, and not a few of them show much accomplishment. The drawings are worthy of a visit by all interested in this scheme for the improvement of the technical knowledge of the young craftsmen of the city, and the members of the Town Council, who have supported the school of applied art so liberally out of the Government grant at their disposal, should not miss seeing the work, which should tend to set their minds at rest as to the good these classes are calculated to accomplish.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the annual business meeting just held, reports submitted by the committee and the treasurer were read, and showed the Association to be in a flourishing condition, both as regards membership and financial affairs. The reports were approved and office-bearers for the coming session elected as follows:—Hon. president, Mr. William Leiper, A.R.S.A.; president, Mr. A. N. Paterson; vice-president, Mr. W. Tait Conner; hon. secretaries, Mr. John White and Mr. Walter R. Watson; hon. treasurer, Mr. William Fraser; hon. librarian, Mr. Alexander McGibbon; committee—Mr. Hugh Dale, Mr. Robert J. Gildard, Mr. J. E. Potts and Mr. Andrew Robertson.

PALLADIAN ARCHITECTURE AND DECLINE.

THE course of lectures in Glasgow by Mr. William J. Anderson, on the architecture of the Renaissance in Italy, was brought to a close on Wednesday, the 7th inst., when Mr. W. Forrest Salmon and Mr. F. H. Newbery, the head-master, took occasion to express the satisfaction of the School of Art directors at the success of Mr. Anderson's work, and intimated that a similar series by Mr. Alex. McGibbon, architect, on Gothic architecture was arranged for next winter, as well as another course dealing with the advanced problems of building construction. In briefly reviewing the session's work in introduction, the lecturer stated that the Italian revival, like other revivals in art and architecture, took rise in bold and original work inspired by the prototype, but mixed with a good deal of what was current, and thereafter ran a course of closer approximation to that pre-existing type till something like literal reproduction was reached, rules prescribed, and the revival finally robbed of its vitality. Another characteristic tendency also observable in such a movement as the English Gothic revival is that the latest periods of the old work are first seized upon by the revivalists, who thereafter incline more and more to adopt earlier treatments. Thus the Italian Renaissance architecture, originating in the work of Brunelleschi and others who were inspired by a study of late antique Roman, gradually inclined to imitation of the style of Augustus's time, and ended in the almost Grecian work of Palladio. "Palladian Architecture and Decline" formed the special subject of the lecture, the chief part of which was devoted to an analysis and criticism of nearly all Palladio's works at Vicenza and Venice, which were fully illustrated by lantern views and diagrams. Although in England his name has attained a fictitious importance relatively to several earlier masters and his talents were buried in inferior material, generally his work showed good taste, a fine sense of proportion, and no little originality in composition. The works of his contemporary Vignola were shown in comparison, as well as those of other architects of the later period in Rome, Genoa and Venice, the most active centres of the time. The causes of decadence were manifold, but at least two tendencies of the kind are clearly distinguishable in the work itself. First, that of the purists, such as Vignola, Palladio and Serlio, bound a little too firmly in ancient usages and the measurements of Vitruvius, the results being the coldness and formality that was common to their work and teaching. Coeval with this, but outlasting it, and of wider and more

disastrous influence, was the tendency due in the first instance to Michel Angelo. In the hands of his imitators the traditional use of architectural features and detail is misunderstood or purposely misapplied, and uncontrolled freedom is indulged in with regard to their application. The Lombard colony of architects in Rome, partly it may be from racial disposition, seem to have most contributed to this resurrection of the grotesque, by which every building of the era was more or less affected.

EXCAVATIONS AT WELLS CATHEDRAL.

INTERESTING excavations have been made recently in the ground south of the cathedral church of St. Andrew, Wells, and also on the east side of the cloister. Canon Church, who has had charge of the excavations, writes:—

"It has been generally known, from evidence contained in the chapter documents, that buildings existed on this ground from very early times until their destruction in 1552. But the exact sites and character of these buildings were a matter of conjecture. The ground has now been thoroughly examined by excavations carried on by the Dean and Chapter under the direction of Mr. E. Buckle, the diocesan architect. The foundations of two buildings have now been laid bare, on different levels, and with different lines and dimensions. One was a small rectangular building of somewhat less than 50 feet from cloister wall to eastern end, consisting of nave and southern aisle or chapel. There can be no doubt that this rectangular building was 'the chapel of the Blessed Virgin Mary which is set in the south part of the great church near the cloister,' so described in many documents of the thirteenth century. It was a chapel of great antiquity, and the foundations may be of an earlier date than the church of the thirteenth century. There is a continuous history of a building on this site, called 'the lady chapel by the cloister,' from the middle of the thirteenth century until 1552. But within this time there were two chapels, one succeeding the other on the same ground. The first chapel was richly endowed for the celebration of funeral services or obits of two bishops and other members of the Bytton family in the thirteenth century, of Dean Godley and others in the fourteenth. Ordinations were frequently held here. Entries in the register of Bishop Stillington (1466-91) show that ordinations were held here in the years 1466, 1467, 1469. After that last year no ordinations in that chapel are recorded until the first year of Bishop Fox's episcopate, 1492. It is very probable that it was in that interval the old chapel was pulled down and a new and larger chapel was built there by Bishop Stillington, of which the foundations have now been partially traced, though the excavations are not yet finished. Foundations have been traced of north and south walls of a nave starting from the cloister wall and the present door in the east cloister wall and resting on the older foundations, of north and south transepts ending in circular or octagonal turrets, and of a chancel extending more than 100 feet from the west end of the cloister. There is no doubt that we have here the foundations of the chapel built by Bishop Stillington. He was a man high in favour with Edward IV. Archdeacon of Taunton, head of a hall at Oxford in 1442, he rose to be Lord Privy Seal, then Chancellor of the kingdom, 1467-73. Stillington only left this chapel, rebuilt chiefly as a monumental tomb and a chantry for memorial services for himself. The building, large and costly as it must have been, had not a long existence, and came to an unworthy end. By the Act of the first year of Edward VI. 1547, all endowments for the support of chantries were to be given over to the King. The uses for which this chantry chapel had been built were now forbidden and the endowments appropriated by the Crown, so the Bishop (Barlow) and the Chapter, burdened by the responsibility of maintaining the costly fabric and suffering under the late spoliation of their own property, saw no other means of relief but to pull it down to the ground."

TESSERÆ.

The Ravenna Mosaics.

IN comparing the primitive art of Rome with that of Ravenna, one is struck by the obvious difference between art derived through Rome from ancient Greece and the purely Christian work of the Adriatic city, wrought by Byzantine hands and with Eastern splendour of colour. Beauty of form is scarcely aimed at or is merely decorative; but the principle of symbolic art-preaching is in full force. Until these great mosaics are copied in the same material it is to be feared that a good idea cannot be obtained of them without a journey to Ravenna. They are distinguishable from those in St. Mark's, at Venice, by the subordination of the gold backgrounds to the most wonderful gradations of dark azure and green in the figures and decorations, which range in colour from the hues of deep sea and purple night to those of malachite and emerald. The high lights in all of them are put in boldly and precisely with golden

tesserae, and white figures are introduced as freely as in the atrium of St. Mark's. Crimson and scarlets are more rarely used, and made precious in the work. The processions of male and female saints in St. Apollinare Nuova are a delightful illustration of this; and so many distressing photographs of them are in circulation, necessarily conveying ideas of utter gloom, blackness and barrenness to the public, that we will vainly try to describe the glorious hues which deck those forgotten walls with the afterglow of the sunken past. The purple and white marble columns of the central aisle of the basilica support on each side a processional frieze in mosaic of male and female saints, ended on the male side with the Lord in glory, a head and face of extreme beauty, though with something of the sadness of later and fallen art; on the female side, by an adoration of the Magi, exactly like some in the Roman catacombs. All the figures are white-robed and tread on emerald green turf, separated from each other by upright palms bearing scarlet dates. They are shod also with scarlet, and bear small crowns in their hands lined with the same colour. The background is of gold, not bearing a large proportion to the size of the figures; but above them are white single figures with ample golden spaces, and a third course of singular representations of New Testament subjects runs round just below the roof, with backgrounds of alternate gold and black; black, or the darkest purple, also prevailing, relieved with gold, in the roof. The splendid and jewelled effect of the whole is beyond praise, and its brilliant lightness makes it especially suitable to the dark aisle of a great city.

St. Andrew, Vercelli.

The style of the whole exterior is that later form of Romanesque which, we may say, was common to Germany and Italy, and which even in Germany lived on some way into the thirteenth century. The round arch is used throughout, except in the quasi-English lancets at the east end and in the transepts. It is when he gets inside that the Englishman feels more at home. It might, indeed, be argued that the inside of St. Andrew's is, after all, not so much English as French. It is, of course, neither purely English nor purely French; but the style which it exhibits is that form of the Early Gothic, or, more strictly, the last stage of the transition from Romanesque to Gothic, which is common to France, with a part of England. It will not remind anyone of Ely or Salisbury or Beverley, but it ought to remind anyone who has seen them of Wells and Glastonbury and Llandaff. And yet, in the mere shape of the clustered columns, Vercelli really comes nearer to Ely than to Wells, while the mouldings are—here the Italian element comes out—less advanced than they would be in any English or even French church of the date. But the capitals would seem quite in place in the great churches of the West of England, and in many French churches too. The proportions are quite northern. There are no broad sprawling Italian pier arches here. That the clerestory windows are round-headed is not wonderful, but the blank triforium space is an eyesore. In this point Modena, a hundred and fifty years earlier, had got ahead of Vercelli. On the whole perhaps the inside of St. Andrew's is less satisfactory than the outside. Yet its slender columns, its vaults, its noble octagonal lantern, make a grand interior in itself, while the interest of seeing forms of this kind where one would so little have looked for them is something beyond words. Walo helped to rob us of our money and our freedom; but he certainly learned a good deal in the way of art, most likely in our own island, certainly on our side of the Alps. By this time the seed sown at Spalato and Ravenna had grown in northern lands into something which Italy might well try to transplant, but which she never succeeded in reproducing.

William Blake.

Blake, in his lifetime, was always specially resentful of any imputation against his fame as a practical workman, or his judgment as a student of art. In one of his marginal notes to Reynolds's "Discourses" he lays down the rule that "Execution is the chariot of genius," and again he says, "Invention depends altogether upon execution or organisation. As that is right or wrong, so is the invention perfect or imperfect. Michel Angelo's art depends on Michel Angelo's execution altogether." And in the public address which Blake intended to accompany the engraving of the Canterbury Pilgrims, he declares, in reply to those who would admit the excellence of his ideas in art, but deny his powers of expression, "I am, like others, just equal in invention and execution, as my works show;" and further he adds, "A man who pretends to improve fine art does not know what fine art is. Ye English engravers must come down from your high flights; ye must condescend to study Marc Antonio and Albert Dürer; ye must begin before ye attempt to finish or improve, and when you have begun you will know better than to think of improving what cannot be improved." To any student of Blake there is, however, need of no quotation from his written opinions to establish the conclusion that he laboured with a constant reference to the possi-

bilities and the means of expression. As an artist, no man's vision was ever more definite in its form; and if there is one special gift which distinguishes him clearly from other and lesser men, it is his power of finding for every sublime thought a corresponding and precise image in the language of art. Blake was from the beginning as close a student of the technical parts of his craft as of its imaginative capabilities. He was a keen and even a severe critic of excellence in workmanship, a diligent observer of all forms of executive mastery in which he had any belief, and his fiercest onslaughts on the works of other painters, ancient or modern, are commonly grounded upon defects of expressional power. There is good cause for insisting upon Blake's powers as a practical artist, and for testing his work by the severe rules he himself laid down. In the first place, this is the only test by which a painter can be finally adjudged worthy of enduring fame. The gift of vision divorced from adequate means of expression may perhaps be proved satisfactorily to the friends of a poet or a painter, but it can have but small significance for posterity. Those who have never known the man can only care to know of his name in connection with an achievement of worth in itself, and, therefore, Blake's place among painters or among poets must be just what his work now proves him to be. This truth seems obvious enough, but there nevertheless remains the fact that English art, if not English poetry, has repeatedly suffered by its neglect. Men have been admitted to a certain reputation in their craft merely from the accepted belief in their gifts, without sufficient practical evidence, and in English painting especially there has been a most unfortunate tendency to award the prize of merit for all other qualities than those which are special and indispensable to a painter. It would be very unfortunate if the unhappy rule should be followed in the case of Blake, and the misfortune would be the greater, seeing that he possessed in a high degree the very qualities which so many English painters have been without.

The Roman Allotment System.

Taking his stand in the centre of the territory which was to be allotted to the new colonists, the augur, according to the old Etruscan rite, drew imaginary lines with his staff athwart the face of the heavens, one horizontal from left to right, another vertical from head to foot, and the agrimensor or surveyor, fixing his quadrant on the spot, divided the district by two broad paths, called the *cardo* and *decumanus*, the one from north to south, the other from west to east. He then proceeded to mark off the whole area by *limites* or balks into the required number of rectangular spaces, which the Romans called *centuriæ*, but to which we should give the less elegant appellation of blocks of land. Each colonist received one or more of these lots according to his military rank, and their size varied according to circumstances, though in the imperial times it was generally much greater than the two jugers or a single acre which was deemed ample reward for the soldiers of the early republic. The whole territory, however, assigned as the *ager* of the colony, was not in all cases given exclusively to the colonists; portions of it were reserved for the more favoured of the dispossessed natives. The Romans were accustomed to mark out the boundaries of estates and fields with stones, *cippi* or *termini*, inscribed with letters and symbolic devices, and consecrated for the security of property with religious observances. Not in Italy only, but throughout the provinces, particularly those of the West, did they carry out this practice; it formed a part of their system and science of mensuration, and upon this basis the fabric of the imperial taxation was in a great measure founded. This actual demarkation of the land was transferred to charts on brass or linen, and registered in the archives of the exchequer. The whole system has perished—brass, stones and all; no such thing as a terminal stone exists throughout the vast space over which went forth the decree of Caesar Augustus, that "all the world" should be taxed. Fifteen or sixteen centuries ago there must have been millions of them. All have perished. Mr. Hallam has remarked that "the oldest things in England are the hedges." Strange to say, these flimsy barriers of sod and brushwood which cattle trample down, and where boys "break through and steal," which require repair and restoration almost from year to year, have outlived the solid landmarks of the steadfast terminus. Such utter ruin has swept over the face of ancient civilisation in respect to the most fixed and cherished of its features. The pledges of the estates of a millionaire have everywhere been broken up to save perhaps a few halfpence in carting of stones.

Raphael and his Times.

Raphael was happy in his parentage and in his patrons, in his master and in his pupils, in his friends and in his rivals: the first misfortune of his life was its rapid and untimely close. He was late enough to profit by the example, early enough to feel the living influence of four of the greatest masters of his art—of Leonardo da Vinci, Michel Angelo, Giorgione and Fra Bartolomeo. The art of painting in oil had been introduced

into Italy barely half a century before his birth; its technical difficulties were already mastered, but it still awaited a master's hand to develop its latent capabilities. His short life included the Augustan age of papal Rome, the age of its splendour and magnificence, if not of its power, and he died almost before the far-off sound of the rising storm had broken the religious calm or foretold the coming miseries of Italy. The two pontiffs whom he served outshone the most illustrious of their predecessors in their luxurious tastes and lavish patronage of the fine arts; and the arts still served the Church, not only with the grateful zeal of favoured children, but with the earnest devotion of undoubting faith. More perhaps from natural instinct than from calculating policy, the Church of Rome has ever been the warm and generous patron of the arts: clothing the mysteries of her faith in forms that speak to the senses, she has wisely sought their aid to win and keep the ready homage of the feelings; while her more northern daughter, with cooler head if not a colder heart, appealing solely to the reason, has laboured in her name to suppress an influence she disdained to use. In the age too of Raphael, while the rich and often graceful legends of the Catholic mythology still retained their ancient hold on the popular belief, the growing taste among the learned of the day for the literature and philosophy of ancient Greece had done much, by softening their early rudeness ere it chilled their early feeling, to mould them to the higher purposes of art. In the newly-opened stores of classic history and fable, the painter was soon to find a new and wider world for the exercise of his art; in the yet unknown and unsuspected specimens of ancient sculpture and decorative painting, new and higher models for the guidance of his taste; and Christian art, relinquishing at last her long attachment to traditional types and conventional treatment, was willing to exchange a fruitless opposition to the graces and beauties of ancient art for a bold attempt to enlist them in her service. The wealth, splendour and prosperity of Italy had just touched the highest limit it was destined to attain; had raised the admiration, not yet excited the cupidity of Europe. The ferocious bands of France, Spain, Switzerland and Germany still gazed from a distance in stupid awe, before they descended from their mountains to scour her fertile plains and rifle her rich cities of treasures they knew not how to value, but found it too easy to destroy. The freedom, it is true, of the Italian republics had already passed away, but the impulse they had given to the culture of the arts and the progress of civilisation in Europe was still acting, still felt. Their nobles had inherited their taste as well as concentrated their wealth, and strove, like their prototypes of old, to beguile the citizens of the memory of their liberties by a lavish display of splendour and magnificence.

Homeric Descriptions of Works of Art.

If we were to take Homer *au pied de la lettre*, and treat all his descriptions of works of art as sober and prosaic accounts of objects which he had seen and handled, we might fancy that his art was more advanced than any of the archaic Greek works which have come down to us. But Homer was a poet, and saw everything through the sweet haze of a joyous imagination. He had a rare faculty for perceiving beauty in the commonplace. There are several passages in the "Iliad" and "Odyssey" which enable us to prove this to demonstration. It is as a much beautified and enlarged copy of his own time and of the chiefs among whom he moved, that Homer represents the times and the heroes of the Trojan war. If Hector or Ajax casts a stone, it is such a mass as two men of the poet's own day could not lift. Diomedes in one day wounds and overthrows two of the immortal gods. The very horses of Achilles and Aeneas are of heavenly breed, and far surpass in all qualities the animals of more degenerate days. The hall of Menelaus glitters as you approach it with light like that of the sun or the moon. A hecatomb of cattle is a usual sacrifice for an Achaean hero, and he is able to produce from his tent talents of gold, vessels of silver, and tripods in unlimited abundance. Thus, again, when the poet has to describe the palace of Alcinoüs, of the wealthy Phæacian race, he runs riot and talks of dogs of gold and silver and torch-bearing youths of pure gold. Even the doors are of the same metal, while the doorposts for variety's sake are of silver. Of course we know that among the early Greeks the precious metals were not thus common. In the same way when Homer describes a work of art, especially when he ascribes the making of it to a god, we must not for a moment suppose that he had seen anything resembling what he celebrates. We can only conclude that he had seen something which enabled a fervid imagination to conjure up that which is described. If the poet saw a dog in bronze he would at once fill his heroes' halls with dogs in gold. If he had seen a shield with three or four simple scenes depicted on it, he would imagine that a shield made by Hephæstus must contain a score of complicated scenes. Even in seeing, his eyes had a vivifying power, of which a modern could scarcely form a conception. Thus in describing a buckle or fibula, such as he may have seen, bearing the subject of a

dog seizing a fawn, he says, "All wondered at the way in which the dog gazed at the fawn as he throttled him, and the fawn, struggling to escape, quivered in every limb." Such language would be almost too vivid in describing a picture by Landseer, and when we compare it with the most expressive works which can be assigned to Homeric times, it may well appear almost absurd. But in all this Homer was neither before nor behind his contemporaries. They said of the mythical Dædalus, who was supposed to have been the first to separate the legs of statues and to indicate the pupils of the eyes, that Dædalus made statues to see and to walk, and so little was this of a metaphor to them, and so completely did they mean what they said, that in some temples they even chained the Dædalian figures of deities by the leg to prevent them from running away. So Homer speaks of the golden maids of Hephæstus as living and moving, and on the same principle, when tripods were set on easily-revolving wheels, Homer feigned that they could go on to the agora and return by their own volition. He was like those unspoiled children to whom a four-roomed cottage is a palace, and a wooden Dutch doll a fine lady.

Rome as a School of Art.

To the sculptor the advantages of a Roman residence are undoubted. Rome has for years held within her walls some of the most famed professors of the art. Canova, writing from the banks of the Tiber, says:—"Italy is my country—is the country and native soil of the arts. I cannot leave her—my infancy was nurtured here." It was among the seven hills, in the immediate presence of the Forum, the Coliseum and the Vatican, that Canova's genius found a fitting and abiding home. Thorwaldsen, again, born in the far north, obtained, at the age of twenty-three, a pension from the Academy of Copenhagen, started at once for Rome, fixed his studio near the Piazza Barberini, and founded, as is well known, his classic style upon the great originals of the Capitol and the Vatican. Flaxman toiled for five continuous years in order to lay in store sufficient means for the Roman journey upon which he had set his heart. During a seven years' residence in the land of poets he executed his famed outlines of Homer, Æschylus, Dante and other works. Gibson, like those great men, came at an early age to Italy, and formed his style upon the Grecian master-works. In the studios of Canova and Thorwaldsen he laboured, and in the midst of the antique marbles the best years of his life were passed. He knew how much he owed to Italy, and therefore he urged upon the Government of his country the foundation of an English academy in Rome, wherein pensioned students should be nurtured in the higher walks of the plastic and pictorial arts. There is no city comparable to Rome as a place for artistic study. It may be a minor, yet certainly it is by no means an unimportant matter, that the ardour of the youthful mind is kindled by the immediate presence of the great originals themselves. Casts from statues are often faulty, and no one will pretend that congregated plaster copies can be looked upon with precisely the emotion awakened by the marbles of the Vatican. Standing before the *Apollo*, the *Laocoon*, or the *Dying Gladiator*, it is not merely a question of what the eye can see, but how much the imagination will realise. We may rest assured that Byron would never have written his immortal lines at the foot of a chalk-white Venus. Mechanical products of but yesterday cannot have about them the halo of antiquity. A statue which has felt the chisel of Phidias, which, as god or goddess, has been worshipped in temples, which had to endure for long ages a nation's overthrow, and then, for a second time, rose into life, is necessarily encircled with a thousand memories, and grows eloquent in eventful story. To adapt an oft-repeated saying, the society of such works constitutes of itself a liberal education. Actual history seems handed down in bodily shape; the poetry of mythology is seen in the most perfect of forms, and thus the mental horizon extended indefinitely from the immediate point of view, art becomes, as she ever should be, the entrance-gate to noble knowledge.

Architects and Builders' Contracts.

An incapacitating calamity happening to the body or mind of the architect will excuse the performance of the contract by him. The architect's contracts being personal contracts, his representatives will not be entitled to complete any which may be unexecuted at the time of his death. The amount of remuneration, if any, which his representatives will be entitled to recover for work done by him in his lifetime will depend mainly on the terms of the contract. The builder's contract not being personal will pass, on his death, to his representatives. If they have assets, they will be bound to execute it, whether they are mentioned or not in the contract, or they will be liable to pay damages out of the assets. They may enforce the contract against the other contracting party, and recover remuneration for its execution. If the representatives of a deceased employer have assets, they will be bound to go on with the contract or pay damages.

NOTES AND COMMENTS.

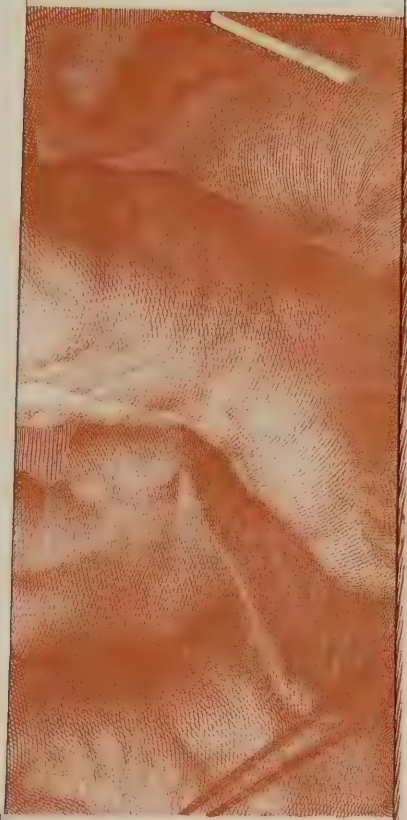
THE position of assessors in architectural competitions does not appear to be generally understood. An architect can decline to accept the office unless it is agreed that his selection will be respected, and in most cases it is likely to be an advantage for the competitors if that course be followed. But assessors are only human, and they may be affected by qualities in a design which are not the most essential. Besides, local authorities might as well resign their offices if they can shirk the responsibilities attached to them. If a member of a Local Board or a School Board can call in an architect to aid him, he may, in course of time, claim the aid of other experts. It will then be difficult to say where his own utility begins and ends. A case has just occurred in Stockport which illustrates the deteriorating influence of the new system on a Board of Guardians. With the aid of an assessor, three sets of names have gained premiums amounting to 300*l.*, and, in fact, a sum of about 1,000*l.* has been expended on the competition. The author of the first plan has a claim on the commission for the building, but the second plan will, it is said, cost 10,000*l.* less than the first to carry out, or 30,000*l.* instead of 40,000*l.* The Guardians could not agree which was the most eligible, and accordingly they have sent off both sets to the Local Government Board, in the expectation that they will be spared the trouble of arriving at a decision. In the old days when assessors were unknown men did not evade their duties so easily. Another case which exemplifies the change comes from Scarborough. A majority of the School Board were in favour of appointing an assessor on the competition for the Vicarage Schools. The Chairman asked the Board if they realised what was to be done. It meant, he said, that they were to allow the decision about character and planning of the schools to pass out of their hands. For his part he would not place any man's judgment in such a case above his own, and there was no architect who was more competent to decide about the merits of a plan than their clerk. It will be said that the Chairman was only exemplifying John Bullishness of an exploded type, and his fellow members did not agree with him. But local government is an important consideration in England, and it will be only an affair of names and forms if those who are elected to govern are allowed to appoint strangers to take their places when discharging the most important duties.

A DECISION which was given last week by Sheriff CAMPBELL SMITH in the Dundee Court, upon a claim for half a dozen mantelpieces, must raise a good many questions about the functions of an architect. A draper in that unsavoury town was having a house built for himself in Wormit. Two oak and four bedroom mantelpieces were fixed in it which were supplied by a firm of cabinet-makers in Dundee. In the North business is sometimes conducted in an odd manner, and the draper does not appear to have troubled himself about where the mantelpieces came from. When the bill, amounting to 58*l.* 5*s.*, arrived, he repudiated all responsibility for them, as he gave no order for chimneypieces. The claim came before the Sheriff, who, as became a Scotch judge, took a sort of philosophical view of the whole affair. His lordship distinguished between conveniences and luxuries. Bedrooms, or rather two in the Wormit House, must have mantelpieces, therefore 6*l.* 9*s.* 6*d.* was awarded to the plaintiff for them, with 5*s.* for setting them up, but no costs. The Sheriff considered an architect was acting dutifully when he ordered bedroom mantelpieces. But mantelpieces that were to cost 20*l.* or 25*l.* a-piece for a drawing-room or dining-room came under a different category, especially as it was suggested that there should be some sort of correspondence between them and the furniture. "Does it fall," asked his lordship, "within the ordinary mandate of an architect to fix the wood out of which the best furniture of the house is to be constructed—to fix, for example, as this architect in effect appears to have done, that his client's drawing-room should be furnished with such an uncommon material as 'Chippendale' mahogany, whatever, according to Dundee terminology, that may be supposed to be?" The Sheriff concluded that

the architect was contriving to gain the furnishing of the rooms for the firm of cabinet-makers, and to secure that end ventured outside his province. The circumstance that the draper's wife and daughter had seen and approved of the mantelpieces beforehand did not weigh with his lordship. "Though I also believe that they talked, as ladies do," said the Sheriff, "in such terms of polite approbation of the design of the dining-room mantelpiece as to lead the pursuers to believe that they had made up their minds in favour of it, the evidence, however, does not go near the length of convincing me that they ordered it. Whatever mistakes the plaintiff may have made, I ascribe them to the talk and the influence of the architect. He has brought about this whole dispute by his undue haste and contempt for the opinion of his employer, who, to the best of my thinking, whether assisted by his wife or daughter, or both or either, was quite fit to select mantelpieces or any other objects of taste for his own house." As it was considered both parties were victimised through no fault of their own, they were left to pay their own costs.

THIS case, in common with many others which have lately arisen, suggests that common knowledge as to the nature and extent of an architect's business is not always sufficient. The majority of architects select mantelpieces as part of their duties, and their judgment is influenced not only by the character of the house, but of the furniture which is to be used and, it might be added, by their opinion of the taste of the owner. Yet an able Scottish judge considers that while architects are justified in bargaining for pine chimneypieces, they have no right to meddle with those which are made of more costly woods. His lordship maintained "that the selection of ornamental mantelpieces, whether of wood or marble or granite, did not fall within the implied mandate of an architect." Everyday practice could be cited as evidence that the Sheriff's dictum is not respected in this country, and with more consistency it could be affirmed that whatever can be considered as a fixture in law comes legally within the range of an architect's duties. Unless we are mistaken, Mr. Sheriff CAMPBELL SMITH's theory of the case originated in the belief that as an architect was an agent, an intermediary between a contractor and a building owner, the extent of his powers must be inferred from some sort of document like a contract deed, and in the absence of that sort of evidence it was reasonable to assume that a visit to a cabinet-maker's and the selection of a costly mantelpiece was an excess of authority. If it could have been shown that the architect of the Wormit house had reserved to himself with the approval of the client the selection of everything requiring artistic skill, the judgment might have been different. Of course such cases may come under the head of sub-contracts, and the liability of the building owner would have to be determined on other grounds.

IT is hardly probable that the Prince SCIARRA would have disposed of some of the masterpieces in his gallery in Rome if he had not been advised that he could not be punished under any existing law. For at least a couple of years he has been so successful as to suggest that advice of the kind was warranted. In the Italian courts, in which the case was tried, the Prince escaped, and when an effort was made by the Italian Government to obtain possession of the pictures through the French courts, it was also unsuccessful. At length the authorities decided to apply the edicts of the Papal Court to the case. They were often evaded, otherwise masterpieces of Italian art would be scarcer in European capitals. But the tenor of the edicts was strict enough against the selling of famous pictures to foreigners. Prince SCIARRA's luck has failed him in the Roman courts. He has been ordered to restore the family pictures or to pay half a million of lire, or 20,000*l.*, the penalty of imprisonment being remitted. It remains to be seen whether the present owner of the paintings will deliver them, for the possession of LUINI's two figures, known as *Vanity* and *Modesty*; the *St. Sebastian*, of PERUGINO; the *Young Man with the Bow*, by RAPHAEL; the family piece by TITIAN; the *Giucatori*, by CARAVAGGIO, are enough to increase the reputation of the wealthiest amateur. He may say, "If Italy wants my pictures let it come and take them."



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Galatea.
From the Hall. Painting by Raphael
in the Villa Tarnasena, Rome.



PHOTOGRAPHED BY BEDFORD LEMERE & CO

"ASCOTT,"
The Seat of LEOPOLD I
GEORGE DEVE

r. 16th 1894.



114 PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

BUCKS.
ROTHSCHILD, Esq.
Architect.

nr: 16th 1894.



BUCKS.
ROTHSCHI
Architect.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

"ASCOTT," BUCKS: J
The Seat of LEOPOLD
GEORGE DEV

Jan. 16th 1894.



IN A PHOTO SPRACUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

M ROSE GARDEN.

OTHSCILD, Esq.

chitect.

ILLUSTRATIONS.

ASCOTT, BUCKS.

ASCOTT, BUCKS: FROM ROSE GARDEN.

GALATEA.

IN the early part of the sixteenth century AGOSTINO CHIGI, of Siena, was among the most prominent of the merchant princes, or, to use SHAKESPEARE'S phrase, "royal merchants," of Italy. His business was not confined to the land, for, like ANTONIO of Venice, his argosies were seen on all seas, and he was, moreover, the owner of mines. As became an Italian of rank, CHIGI felt it was his duty as well as his privilege to expend part of his wealth on works of art. Having through his influence at the Papal court obtained land lying between the Via Lungara and the Tiber in the Trastevere, and opposite the Palazzo Farnesi, he commissioned his townsman, BALDASSARE PERUZZI, to design a summer villa, which was to be as beautiful as money could procure, and was to be adorned with frescoes by RAPHAEL. Architect and painter were qualified to work together. VASARI'S account of the building is worth giving, for as he was also an architect, he was able to express the value of the work as it appeared after completion:—

This edifice should rather be described as a thing born than as one merely built. The exterior decorations are in *terretta*, and exhibit very beautiful historical representations, executed by Baldassare with his own hand. The hall of this palace is also adorned by this master, who painted columns in perspective therein, the depth of the intercolumniation causing it to appear much larger than it really is. But the most remarkable part of this work, and a subject of deserved admiration, is the loggia of the garden, wherein Baldassare has painted stories representing Medusa turning men into stone, and than which nothing more beautiful could possibly be imagined. Near this we have Perseus striking off the head of the monster, with other paintings in the angles of the ceiling. The decorations of this loggia are painted in perspective to imitate stucco-work, and this is done so perfectly with the colours that even experienced artists have taken them to be works in relief. I remember that the Cavalier Tiziano, a most excellent and renowned painter, whom I conducted to see these works, could by no means be persuaded that they were painted, and remained in astonishment when, on changing his point of view, he perceived that they were so. In the same palace there are certain paintings executed by Fra Sebastiano Veneziano (del Piombo) in his first manner; and by the hand of the divine Raphael there is the *Galatea* carried off by marine deities.

In our time the architect's deceptive painting is less appreciated than it was by his contemporaries. What gives the villa attraction to-day is the series of paintings by RAPHAEL, and especially the *Galatea* on which VASARI'S attention appears to have been concentrated. The vaulting of the first room is assigned to the legend of CUPID and PSYCHE, in which RAPHAEL contrived to introduce all the gods and goddesses. In connection with the incidents he painted the characteristic troop of cupids or amorini bearing symbols of the deities, that are universally known as "Raphael's Boys." The whole of them have been illustrated in *The Architect*. Neither the architect nor RAPHAEL seemed to care much about the effects of wind and weather on the frescoes. The room, porch or vestibule was partly exposed, like the loggie in the Vatican, and in consequence the paintings suffered to a deplorable extent. After a century and a half had elapsed, CARLO MARATTI persuaded the owners of the villa to have windows constructed in the side that was open, and if his suggestion had been disregarded, probably few traces of the *Cupid and Psyche* series would have survived. Unfortunately CARLO MARATTI repainted the background in blue, and however well-intentioned was his effort, it has made RAPHAEL'S works become a disappointment to many visitors to the villa. The skilful composition and the beauty of the figures hardly compensate for the discords offered by the colouring.

The *Galatea* is in an adjoining anteroom, and fortunately was always more secure from atmospheric influences. It is generally supposed that RAPHAEL did not allow any of his pupils or assistants to aid him in this work, although they were permitted to execute the paintings of *Cupid and Psyche* from his designs. The reason is obvious. The painting was a novelty. Mythological subjects were as familiar to painters in that age as any others, but the novelty of the *Galatea* is in the peculiarity of treatment. The picture possesses some of the qualities which belonged to Greek works. The general flatness, for the figures are almost placed on one plane, the contiguity of the cupids to the figures below, and the remoteness of the aerial and

marine beings from those of ordinary life, all testify that the painter was not following his ordinary course. The famous explanation which RAPHAEL offered to his friend BALTHAZAR CASTIGLIONE, beginning "*della Galatea, mi gran maestro*," further indicates that he was engaged in an experiment. The sense of the epistle is as follows:—"With respect to the *Galatea*, I should hold myself to be a great master if there were in it one-half of the merits of which you write, but in your words I cannot fail to perceive the partiality of your friendship for myself. To paint a figure truly beautiful, it might be necessary that I should see many beautiful forms, with the further provision that you should yourself be near to select the best; but seeing that good judges and beautiful women are scarce, I avail myself of certain ideas which come into my mind. Whether I have in myself any portion of the excellence of art, I know not, but I labour heartily to secure it." The expression about the rejection of models ("*io mi servo di certa idea che mi viene alla mente*") has been commonly accepted as a statement of RAPHAEL'S usual practice. The number of his studies from draped and undraped models should be enough to prove the absurdity of that conclusion. RAPHAEL was writing to a nobleman who was acquainted with the artist's method, and therefore he informs him that for the *Galatea* he adopted one that was strange. Instead of utilising a model, he trusted to his own creative power, or idealism, when painting the figure of the nereid. It is not unlikely that RAPHAEL was inspired by a decorative work, or a fragment of one, which some Greek artist had executed, and which he endeavoured to equal or rather to surpass. Whatever was the origin, the *Galatea* holds an unique position among the artist's paintings. Well may VASARI describe it as a fresco of the most exquisite beauty.

With that opinion the most thorough connoisseurs of all lands have agreed. BURCKHARDT, who is so difficult to satisfy, declares it to be the noblest of all modern mythological pictures ("*das herrlichste aller modern-mythologischen Bilder*"), and in his description of it he ceases to be coldly analytical and becomes enthusiastic:—

In it the allegorical myth that is used is no conventional motive for the creation of beautiful forms. What Raphael was eager to give could in that form alone be expressed with purity and beauty. What ordinary human story would have so well sufficed to express so significantly the awakening of love in all its majesty? The ocean princess becomes a type of pure, blissful longing. Surrounded by her nymphs and tritons, who are under the influence of love, she sweeps along the quiet sea, a mark for the arrows of the amorini; to the reins of her dolphin, a wonderful example of them has attached himself, as if to enjoy the impulse of being carried along the water. In the *Galatea* we can see how independent of the antique was Raphael in his feeling for form; every contour in the painting is his own. In his modelling he is more naturalistic than the Greeks; he shows himself to be a son of his century. The school of David might furnish figures that are more correct, but who would exchange those in the *Galatea* for any of them?

KUGLER, in describing the painting, says it is "one of the most beautiful compositions that art has produced, imbued with a sense of life and enjoyment that is perfectly enchanting. Yet with all this, and in a scene of strictly Pagan and sensuous imagination, the purity of the feeling becomes a main element in its beauty." If we were, however, to print all that has been said in praise of the *Galatea*, a volume would be needed. The only expert of any note who took an opposite view was RICHARDSON, in the early part of the last century. His criticism was curious:—"The *Galatea*; 'tis pretty well preserv'd, but does not answer the Idea I had of it. The face of the Galatea is not Handsome, nor perfectly well Drawn: And her Drapery, which was Red, and is flying in the Air, besides that it has no graceful Shape, is now so Black that it looks intolerably Heavy, and as Hard against the Ground as if it was Inlaid: But doubtless much of this is owing to the Changing of the Colour. Throughout the Colour is Disagreeable, upon the Dirty Reddish Tinct." The self-confident ingenuousness with which RICHARDSON suggests that his idea of the subject was superior to RAPHAEL'S is delicious, but it was by no means peculiar to him. Many English visitors to Rome have been no less assured of their infallibility in determining the value of pictures at a glance.

It is, however, much easier to condemn the *Galatea* than to make a copy of the fresco. On that account it is one of the least known of RAPHAEL'S works, and unless we are mistaken, the print which we now publish is the first that has appeared from the *Galatea* in this country.

GOLDSMITHS' WORK: PAST AND PRESENT.*

THE subject on which I have been honoured by being asked to speak to-night is a very large one, and one very near to my heart. It embraces so many points, its history and theory have been written about, spoken about, divided and subdivided under so many heads that historically and theoretically there is little that is new to say; but curiously enough, since the monk Theophilus wrote his famous treatise in the eleventh century little has been written on the practical side of the question; and as it is before the Applied Art Section of this great Institution I have the pleasure to appear, I shall venture to let my paper take a more technical form than would be desirable for a general audience.

Alloying, melting, working, colouring and polishing gold have been my chief studies and occupation for over twenty-five years; for long years before that I modelled, designed and drew for goldsmiths' work; and though I should easily be beaten in the use of a blow-pipe, and find it a little difficult to arrange very fine grains with a pallion of solder, yet I think there is no calculation for alloy or mixing of the precious metals, no pot for melting skittle, plumbago, or other kind, no tool for working, no direction of heat, whether a sharp point of flame, a blunt one, or an all over blast, with which I have not a perfect acquaintance. The different metals necessary to mix with the gold to obtain the softest and richest effects for enamelling, or the different qualities of solder best to use for various kinds of work, wet or dry colour, are all familiar to me; and this everyday experience of mine leads me to hope that I may be able to interest you in the working of the gold, and show how it was done in former times and how it is done now.

There seems to be a general consensus of opinion that gold was the first metal discovered. It is beautiful in colour, was found in rivers, in sand and on the surface, while other metals had to be dug from the bowels of the earth; it is so attractive in appearance, the most untutored savage would observe its beauty, and it was universally known.

Goldsmiths—that is, men who work in gold—are supposed to have been the first workers in metal, and to have been the pioneers in all the manual arts.

There is a popular idea that gold can only be fashioned by the aid of heat, but as I had occasion to point out in a lecture I gave last March, before the Society for the Encouragement of the Fine Arts, much of the ancient work was made without the application of heat at all.

In every small treatise, in whatever language it may be written on our subject, one quotation from an old author is always given, and as there is no better way of expressing the qualities of gold, I will repeat it:—"Gold is very ductile, a spreading and oily metal;" and to use an old workshop term, "it is very kind." It can be hammered, drawn as wire, and fashioned without heat, and it is almost the only metal which is ductile enough for this without the aid of steam power.

If we examine many of the oldest specimens, we shall find that they have been worked cold, beaten and twisted into shape by sheer force, which is, literally, an application of heat, but it is not so technically.

There is a tradition that Tubal Cain was the first to make gold-leaf. Anyhow, the art of beating gold is so old that, like the early history of most things, "its origin is lost in obscurity;" but, as every handbook will tell you, Homer and Pliny both refer to it. Homer also mentions and describes a blast furnace with twenty crucibles, and melting-pots have been found in many places in Egypt.

It was quite possible to have hammered together the little particles of gold found on the surface of the earth and elsewhere, and made them into rough utensils or ornaments without melting the gold at all; but probably as soon as furnaces and melting-pots were known, the gold was melted and run into a rude skillet before the hammering process began.

It would take up too much time to mention the various places where gold was found in bygone times, or to enumerate the usual sources from whence gold is obtained now. Suffice it, for our purpose, to admit that the very first thing a goldsmith needs is pure gold; not that pure gold can be worked, for it cannot. No really chemically pure gold was ever worked, or ever could be. Many ornaments of refined gold are mentioned by old writers, but in no instance have I found any record of any antique made of pure gold. Purity in this metal is represented by the number 24; standard gold has 22 parts pure to 2 parts of alloy; 18-carat gold has 18 parts pure to 6 parts of alloy. French gold, called 18 carats fine, is not so pure as the 18-carat gold used here; it only assays to 17 $\frac{3}{8}$, or a quarter of a grain worse than would pass Goldsmiths' Hall as 18 carat. The French gold is alloyed with copper, which gives it the reddish tinge. We alloy with both silver and copper, and no point has been more discussed and quarrelled over than the exact amount of silver and copper necessary to

make the best alloy. It is only 6 parts in 24—not much to wrangle about, you will say.

I will not attempt to give you all the formulæ, or to decide which is best, only, like everybody else, in one particular proportion of silver and gold I believe, and in no other; even when 22-carat gold is to be prepared, the 2 parts of alloy are matters for much comment and dispute. I know two really estimable men who quarrelled bitterly on this question; the one said that of the two parts one should be silver and the other copper, while the other stoutly maintained that the proper proportion was one and a half copper and half silver.

Well, the gold being alloyed to 22, 18, 15, 12, 9 carat, or even a lower quantity of gold, it is put into what is called a pot and melted on a furnace. This furnace can be heated by gas, by charcoal, or by coke; it could be by electricity, but the application is not sufficiently perfected to be used for a goldsmith's furnace yet; however, it will, I hope, be so soon.

When the gold is absolutely fused—and the greater the proportion of gold in the mixture the greater the heat required to fuse it—it is poured into a mould, called a skillet, and allowed to cool; when cold it is ready for flattening, which is done by rolling it between two heavy steel rollers. It depends on the intended use how thin the metal is rolled. There are gauges for this, like those for wire and sheet metal.

If the gold is wanted for gem rings, it is left thick and cut with shears into slips. I mean for good work. For common work done in Birmingham and Sheffield (and I am sorry to say in London too), the settings for the stones are stamped out by machinery, and the claws bent over the stones, instead of, as in the best work, the claws being cut to the stone. The goldsmith will, for himself, further flat the gold in small mills if it be necessary for his work. He will also fuse small pieces or cuttings into the shape he desires on what he would call "a coal," really a long piece of charcoal hollowed in the centre, for the very old terms are still used in workrooms (charcoal was called "coal" long before "sea coal" was burnt in the chapter-house at Westminster, where the first fire was made of what we now call coal of which we have any record; but this by the way).

Having arranged his gold in the rough, the workman proceeds to hammer it more nearly into the required shape. If it be for a ring with stones in it, after he has fused a thick mass for the head he hammers a long straight piece (cold work, you see), then with his pliers he bends it round to get it roughly into shape; then he files the inside to get it smooth enough to make it the desired size to fit the finger; it is then filed and scaupered into shape, carved and clawed. The ring is soldered together at the back, it is polished with sand-paper, with "water air stones," which look very much like slate pencils, and with hard wood. The little claws are "threaded out," i.e. polished with whitey-brown thread, on which a little rouge has been rubbed. So far all work goes through these processes, whether it is to be finished bright or coloured; the last thing done is setting the stones.

Now, you will perceive that the gold was alloyed and melted into an ingot; so far heat was used, but for the flattening no fire is necessary. Tradition—and all tradition has a basis of truth—says the gold the ancients made the ornaments for the dead from was beaten into the thin plates from which the wreaths, &c. were cut between thin layers of leather and with a very heavy hammer. Gold-beaters now beat their gold between thin leaves of vellum. The thin gold used by the ancients for their funeral ornaments was of the same degree of fineness as that beaten now, which has about one part alloy, either silver or copper, to twenty parts of pure gold. The alloy diminishes the malleability, so the inducement is only small to deteriorate the quality, for gold leaf is sold by size, and not by weight.

Now the gold is cast into oblong ingots, about $\frac{3}{4}$ of an inch thick and wide, and each weighing about 2 ozs.; this is flattened into a ribbon about $\frac{1}{2000}$ th part of an inch thick, then annealed or softened by heat, and cut into pieces about an inch square; 150 of these are put between vellum, each piece of gold in the centre of a square of vellum; and another added, until a pile of 150 is made. This pile is enclosed in a double parchment case, and beaten with a 16-lb. hammer; the elasticity of the packet lightens the labour, as the hammer rebounds with each blow. The beating is repeated until the inch pieces are spread out to 4-inch squares; they are then taken out, cut into four pieces each, placed this time between gold-beaters' skin, and hammered as before, but this time with a lighter hammer; they are again quartered and again hammered, thus producing 2,400 leaves, having an area of nearly 200 times that of the ribbon and a thickness of $\frac{1}{200000}$ th of an inch.

The soldering of the ancients was something very marvellous. Castellani is of opinion that, so far as goldwork was concerned, they were better chemists than we are, and used solvents with which we are unacquainted.

The delicate grainwork with which the Etruscans covered large surfaces is not easy to imitate. Here is a little piece

* A paper read by Mrs. Philip Newman at the meeting of the Applied Art Section of the Society of Arts.

roughly done as an illustration, but there are few men who can do it now.

For a long while after the Etruscan gold-work came to light it was found impossible to copy the colour of the gold, but now we can get it exactly by putting the proper proportion of common salt, saltpetre and alum in a flat-bottomed pot with distilled water, and heating to 212 deg. Fahr. This mixture is not pretty to look at, for it boils up a pale, sickly, greenish colour.

The gold-work to be coloured should not be of less than 18 carats fine. It is hung from a platina ring with either platina wires or horsehair: there should be plenty of it, for the greater the amount of gold to be coloured the better the colour of each article. The work, having been properly cleaned, is dipped into the boiling mixture, taken out, dipped into clean boiling water, dipped into the colour pot again, again washed in hot water; about the third dip the rich bloom of colour comes. Much more washing is still necessary before the work is ready to dry in hot boxwood dust, after which it is scratch-brushed. Here is a scratch-brush: the hole in the centre fits on to the mandril of a foot lathe; the article to be finished is held against the revolving brush in the hands of the workman. Now, nothing is so good to feed the scratch-brush with as beer; this drops on the revolving brush from a little hole in a small tub fixed over the lathe, so that the beer drips on the brush as it revolves.

If this scratch-brushing is done by a clever operator, 18-carat gold has the beautiful bloom of the best Etruscan work; this is the very reverse process of gilding, for in gilding pure gold is added to and spread over the surface, while in colouring the alloy is eaten from the surface, leaving only pure gold visible. We know that the Japanese derive some of their ideas from the most crystallised of all old time peoples—the Chinese. Shall we ever have a more intimate acquaintance with their inner life and their old traditions, and find out whether the Japanese “pickles,” as their colouring mixtures are sometimes called, are made from early traditions of the craft—traditions of the knowledge emanating from the Hindoo Koosh, but lost lore to European nations? As to the processes by which the result was obtained in the old work we have little to aid us; but we may safely say that whenever the work was done in prehistoric times, in Egypt, in Assyria, in the cities of Italy occupied by the Etruscans, in Greece, in Rome, or nearer our own time, in Florence, it was not the working that was so very different from our own, it was the almost intuitive feeling for art that made the gulf between the goldsmiths' work in the past and to-day.

In very early times mechanical aids to repetition were adopted; the Greeks used dies for the little amphoræ they were so fond of hanging round their necklaces; no doubt, also, they made cutters for the pateræ so often seen in Greek and Græco-Etruscan work. I do not suppose they had any better equivalent for a monkey press than a sledge-hammer, but they had that. Yes, the old craftsmen beat, flatted and annealed their gold; they drew wire, they twisted it, they screwed it, they did *repoussé* work, they engraved the most beautiful intagli on their gold rings, they knew how to prepare their work for the inlaying of stones, of which enamelling was only an imitation, and in the earliest times they understood Cloisonné and Champlevé enamels. At the present time all these things are done, but we do not often have artists to make the dies, and we depend too much on the dies; it is the curse of cheapness that spoils our work. Now necklaces, brooches, bracelets are made by the dozen, all alike. It spoils the work, and it spoils the workers, for instead of a man being able to make all usual trinkets right through himself, it is found cheaper for a foreman to give so many articles, all to be alike, to one man, who takes so many boys under him. These boys are only taught to do one portion of the work, some only learning to make snaps, others only joints, others only tongues and catches. In after years what is to become of these lads? The men who teach them can only make one thing; a brooch-maker can only make brooches, and so on, and of the separate parts of that thing he teaches so many boys to make one part only; not one of them could put them together from anything taught in their factory, and but few lads have the wish or the application to learn more than they are taught. No, it was a better time when the old system of apprenticeship prevailed, and it was to the master's interest to teach a boy to be a thorough good workman. When the goldsmiths who have been apprenticed are all dead and gone, where will the craft be then? The boys “taken on” will not be of any use; indeed, many of them now, finding it impossible to get their bread with the knowledge they have acquired, go for soldiers, so the little they have learnt is lost.

If technical schools would only supplement proper apprenticeships instead of attempting to be a substitute for them, they would do much good. Reading all about an art for a year is not so useful as working with others who know and exercise it for a month. Practice is necessary, has always been necessary, and will always be so. There is no art, craft or trade where constant practice is so necessary as that of a goldsmith. I know of several goldsmiths now whose technical work is quite

equal to that of the best periods, but they have not only served their time, but have lost no opportunity since their apprenticeship expired of learning more about their work. Such goldsmiths are becoming more scarce every year.

In old times, in all ages and in all places, there were two separate and quite distinct branches of goldsmiths' work. In the one case, the work done for the temples in honour of the cult of the people; in the other, for the houses of their chiefs and kings, and for the adornment of their women; but it seldom happened, until at any rate comparatively recent times, that the secular work was done by the same craftsmen as the work for religious purposes.

In the early Christian times there was little sacred art at all, the sect was too poor and despised; but, as Christianity gained noble and rich converts, and the Church became a power, it was only natural that their places of worship should become more magnificent than the heathen temples had been; and that much of the gold and silver of the temples should be melted up and remodelled for the service of the Church.

How far back guilds of workers in gold can be traced I am sorry I cannot tell you, but we must suppose that the Aurifices of Rome formed a sort of corporation, for they erected a little triumphal arch in honour of Septimius Severus in the Velabrum; this arch does not bear any characteristic mark of goldsmiths or their work.

In Rome I have seen ancient inscriptions bearing these words, “Aurifex Aug.,” “Aurifex Augustæ,” “Aurifex Tib. Cæsaris,” “Aurifex Liviae,” &c. The inscriptions prove that in and after the times of Augustus and Livia, emperors and empresses had goldsmiths in title attached to their service; similar inscriptions to these have been found in Britain, I believe.

The Gallic people have long traditions as goldsmiths, for records remain of goldsmiths in Limoges before the invasion of Julius Cæsar. The name of only one Gallo-Roman goldsmith has been preserved; it was Maburnius; he is mentioned in a will of the fifth century. Perpetuus, Bishop of Tours, left the silver cross he used to wear and some other trinkets to a brother bishop, because he leaves the gold cross, &c. made by Maburnius to his church.

There were, and I hope still are, in the Cabinet of Antiquities in the Bibliothèque Nationale, Paris, the hilt of a sword in gold, gold bees, and other objects found in the tomb of King Childeric at Tournay, all of beaten gold.

One of the apprentices of Abbon, at Limoges, a youth named Eloi, was afterwards one of the patron saints of French goldsmiths. St. Eloi, in his early days, was ordered to make a seat for the king—whether a saddle or a chair has never yet been quite decided—but he worked so diligently, so carefully and so honestly, that out of the gold entrusted to him he made two seats without either being in any way defective, and he made the two in the time he was expected to make one; small wonder that he became minister to Dagobert I., called “The great.” Still, in the midst of all his grandeur and power, he worked as a goldsmith with his own hands, only assisted by his apprentice, Thillon, a Saxon.

In the time of St. Eloi there were three grades of goldsmiths—masters, companions and apprentices. St. Eloi founded a monastery at Solignac, where he taught the goldsmith's art to his monks. After the death of his master, Thillon became abbot, and continued the teaching of the craft. St. Eloi also founded a convent in Paris, on a large piece of ground given him for the purpose, near where the Palais de Justice now stands. It was known as the Maison de Madame St. Aure (Aurata), from a virgin that came to Paris from Syria preaching the Gospel in Hebrew to convert the Jews. Perhaps she was chosen as first abbess on account of her name, for St. Eloi had his favourite art taught here also, and the convent became the centre for gold embroidery for Church work. The nuns were celebrated, not only for their exquisite work and the beauty of their designs, but also for the excellence of the gold thread they manufactured, which was purchased from them by all the world. The old accounts of this convent rather lead one to suppose that vessels and crosses for the service of the Church were also made here; but I am not sufficiently sure that the nuns made them, to cite those nuns as women goldsmiths.

In Paris, during the reign of St. Louis, strangers were allowed to work as goldsmiths, after they had lived for a year and a day in the quarter of the Pont au Change or Grand Pont. If they were approved as craftsmen and good fellows—for all this time they must have been under the observation of the masters of the craft, who certified them to be respectable men and good workmen—they had to pay a tax to the king, according to the value of the custom they had; there was one Richardin, the enameller from London, who paid an impost of 3 sous; Robert, the Englishman, who paid an impost of 12 sous; and many other names of foreigners are recorded as having practised the craft at that period in Paris.

In the eleventh century the monk Theophilus, who wrote on many arts, wrote a treatise on gold-work, which, when all the odd superstitions about the preparation of gold are elimi-

nated, evinces a knowledge, and a practical knowledge too, that would be hard to excel now.

Theophilus, whoever he was, and from whatever country he came (for these two details are not recorded, and the theory that he was of English birth never has been either proved or disproved), was a thorough master of all branches of the art; and a translation of his work will do more to help an amateur in his studies than any of the so-called technical hand-books ever written.

The treatise commences by describing how the factory—*fabrica*—should be built. He recommends that it should be large and spacious, should have a wide window with a good light; he directs that there should be planks put round the table where the workers sit to catch the pieces of gold that may fall in working. To the left of the worker a furnace must be built of well-kneaded clay. He must have bellows, anvils, hammers, pincers, nippers, draw-plates, screw-plates, files, irons to scoop out the gold, to scrape it, to grave it, and to cut it. These "irons" are the great-grandfathers of our scrapers, split stickers (*spelzsticker*), bull stickers, &c., used now. He does not mention "skins," always attached to the board nowadays, but probably the workers then wore leather aprons, which answered the same purpose.

This monk knew all the ordinary work. He tells how to begin and to finish cups for the altar, niello work, enamelling and almost all the details of every branch of the craft; and all that he describes he did with his own hands, even to the building of the furnace. How many craftsmen are there who could do this now? Many of them can only do one thing, and that indifferently well.

Theophilus taught that a lad must be apprenticed for not less than eight years; then that another term was desirable, and that if all that could be learnt was to be acquired, a further term of pupilage must be spent to make a first-rate master. Theophilus contended that it was necessary to be an apprentice for twenty-one years. In the Bibliothèque Nationale there is an engraving of Etienne Delaulne's workshop, done by himself. Etienne Delaulne was better known as "Stephanus." This engraving has been much copied and the copies much used; it has even come down to be a frontispiece in a retail trade catalogue, but it is so very interesting that I asked my husband to prepare a slide for me from it, in order that I might point out to you the resemblance between a factory some five hundred years ago and one of the present day.

The Dictionarium of Magister Johannes de Garlandia gives some quaint accounts of customs in the trade, such as the rule that no master should be permitted to take a new apprentice before the one already bound to him was half out of his time, and that no master goldsmith should be permitted to take more than one outsider as an apprentice under any circumstances (by an "outsider" he means a lad the son of a foreigner, or of a father who followed a calling other than that of a goldsmith).

The author of this Dictionarium was of the noble family of Garlande; he followed William of Normandy into England. Both John Garlande and his Norman master were great patrons of the art; and I think Garlande could hardly have written as he did unless he could have worked himself, as well as describe the methods of work.

In all that concerns our subject the English were never far behind; there are Saxon jewels of great interest in the British Museum, and in the Ashmolean Museum there is King Alfred's jewel, a drawing of which will be shown presently; at any rate the commercial spirit of the English was always manifest. It is related how English treasure helped the Abbé Suger out of a great difficulty. I should remind you that the Abbé Suger was Abbot of St. Denis and minister to Louis VI. in the twelfth century. Suger had prepared a magnificent gold crucifix and other ornaments for his abbey church, but for a long time after they were ready he could not obtain the stones he required to finish them, until when he began to despair three monks from England came to him to sell the jewels removed from the table cups of our Henry I., jewels that the king's nephew, Thibaut, Count of Champagne, had given to various convents to procure indulgences and prayers. How the jewels came into the hands of these three monks I am unable to tell you, but history says that the Abbé Suger bought from these men, for a sum equal to 400*l.* of our money, jewels that were at that time of priceless value. The crucifix was melted in 1590 by the Leaguers.

In the eleventh and twelfth centuries much gold was used in the manufacture of cups and decorations for sacred purposes; probably that is why so few of them remain now.

The gold on the Paliotto executed for that very interesting church in Milan, St. Ambrogio, by the goldsmith Wolvinus, was valued at 280,000 gold crowns; it is a most beautiful piece of goldsmiths' work, enriched with camei and intagli, precious stones and enamel. Quintilian justly observes, "*Ars summa materia optima melior*," and the value of the exquisite design and arrangement of this work is far above the value of the material employed, yet the value is, in this case, so far above price that there is an additional reason for being glad it is still preserved to us. Count Balzani told me how nearly it was

lost when Milan was entered by the famished soldiers of Napoleon, and how it was saved by the adroitness of a priest, who knew that a small portion had either been stolen or lost, and that the vacant space had been supplied with a good imitation in copper gilt. This little accident was only known to a few of the priests, the outer world knew nothing of it. When the soldiers entered the church the priest advanced to them, asking what they wanted. He was rudely answered, "The gold altar case and the gems set in it." "Alas!" he said, "would that we had a gold altar, its value would supply the wants of many; it is this gilt Paliotto," he continued, "that you must mean. Look! I will show you the gold." And he coolly broke away the restored copper gilt portion, saying, "Do you think, if the gems ever were real, those here now are better than the copper? No, poor fellows, it is not in this bare, half-empty, poor old church that you will find treasure; go seek it elsewhere." And they went without touching the Paliotto.

There is much to be said about art of the kind in our own and other countries, but there are some illustrations to be thought of, and, with your permission, they shall now be shown and described.

The paper was illustrated by a series of lantern slides, taken from fine historical examples of jewellery in the Gold Ornament Room of the British Museum, and other great national collections.

COLOUR IN STREET ARCHITECTURE.*

(Concluded from last week.)

THE colours of terra-cotta when used sparingly in a front certainly tend to enliven the inevitable dreariness of the brickwork with which it is customary to use it. I am strongly of opinion, however, that it is a great artistic mistake to use the material for the whole exterior of a building from plinth to chimney-top, or even for wall surfaces of any extent. Of the many terra-cotta colours in general use the reds, on account of their heaviness and density, are, in my opinion, the least satisfactory. Although great strides have been made in manufacture since the Constitutional Club was erected, a more uniform shape and tint having been obtained, yet the general effect of some of the last examples we see around us are worse than the first. A new colour, technically termed chestnut buff, is pleasing in tone and in tint, is one that would harmonise well with many natural red brick colours, but I am unaware of any instance of its use in London. The pinky buff and golden browns are certainly the most pleasing tints when properly used; but, alas! the beauty in this, as in much else, is stated to be fleeting.

It may be instructive to examine a particular example of the application of the material under consideration. The Natural History Museum at South Kensington, by Mr. Waterhouse, is unquestionably the best instance of its use that could be taken for review, as reliable criticism of the colour effect in this building would be of a standard value from the fact that any conclusion arrived at could not well be modified by the chance of a higher perfection of manufacture being attained in the future. Although, as I have said, terra-cotta appears to be unsuitable for any work of a monumental character, from many points of view the Museum is a very beautiful building. The great satisfaction that one feels on contemplating the design, however, is qualified by the startling cleanliness and freshness in the broad surfaces so long after completion. These characteristics, it must be allowed, are not the constituents of artistic repose in colour. One is therefore led to the inevitable conclusion that the satisfaction experienced arises from the fine architectural conception and beautiful detail rather than from the colour effect. In support of this conclusion we further notice that the upper parts of the composition, the top stones of towers and pinnacles, and particularly the series of gabled dormers, are aggressively bright in tone, clean and fresh as when first built. The general surface of the façades, sheltered by the main cornice, are of an absolutely uniform tint, of a lower scale than the parts first mentioned, while the series of recessed windows under semi-circular arches are strongly emphasised by a visible layer of dust and soot obliterating the colour. It is this palpable uncleanliness in the sheltered parts of terra-cotta that is so objectionable, whilst the exposed portions have a bizarre effect. The eye wanders over the composition, seeking in vain the repose of one weathered block, and we leave the scene with an impression of a bold beautiful design wrapped in a mantle of a monochrome striped with bluish grey, and, perhaps, repeating the lines of Byron:—

So coldly sweet, so deadly fair,
We start—for soul is wanting there.

One could hope that some note of the probable appearance of this building, say, a thousand years hence, might be handed

* A paper read at the Architectural Association on March 2, by Mr. S. B. Beale.

down to posterity, to meet the eye of Macaulay's New Zealander when, in the ages to come, he takes his stand on a broken kerb of the Exhibition Road to sketch the ruins of the Imperial Institute, to the exclusion of the Museum as too new-looking to be noticed.

Coming next to the Constitutional Club in Northumberland Avenue, it would be ungenerous to be strictly just in expressing an opinion, for the club is without doubt a hopeful spot in the surrounding gloom. We do not see the vivid freshness of the Natural History Museum, instead a precipitate of grime, not in sheltered portions only, but all over the composition, and still an absence of any pretence of weathering—making one long to take a broom and clean things up a little. Terra-cotta fronts in busy thoroughfares stand in urgent need of an annual spring clean.

Much the same criticism applies to the French Church, in Soho Square, as to the Natural History Museum, on the score of an absence of reposeful weathering in the material. The street front impresses me as particularly hard and unsympathetic in tone, but, needless to say, very clever in design and detail.

The restrained application of the material to dressings by some architects of eminence does not lay terra-cotta open to the same strictures as when used for general wall surfaces. Some of my remarks on the colour effect of this material may appear hypercritical in view of the improvement its introduction, when sparingly applied, has made in London street architecture; but I have considered the material *per se* and have confined my review to the best examples extant. There are specimens in Oxford Street and Piccadilly Circus that exhibit colour effect in terra-cotta to be infinitely worse than anything that stock brick or bad stone has ever produced. I have examined the material at its best and at its worst, and have come to the conclusion that the colour effect of terra-cotta after fifteen years' experience has brought the problem of dispelling the gloom in London street architecture no nearer a solution.

Having now critically reviewed the colour effect of some of the possible and some of the impossible materials seen in our streets, it will be gathered, I think, from the foregoing that I hold the view that not one of these materials as now used do much to brighten town existence. How can improvement be effected? First, I think, by revolutionising the almost universal practice of designing cornices, window-heads, strings and labels, with the idea of throwing the rain off the surface of the building, of sheltering a great portion of it from the action of the wind, and preventing the sun shedding its gentle influence upon the composition. This change, however, will not entirely prevent the deposit of soot and dirt on the most sacred portions of the fronts. If we are to obtain the best weather effect possible, and in a measure retain the self-colour of building materials, all parts must be designed so as to allow of the surfaces being exposed to the full effects of the elements.

As to the treatment of wall surfaces. The rigid requirements of light for the interior prevent the arrangement of much breadth in colour effect. It would seem then all the more necessary that the flat surfaces that do remain to us after the window space is allotted, should not be further broken up by arbitrary variations in colour and material. The least unsatisfactory specimens of architectural colouring are to be seen in fronts that are either all stone or all brick throughout.

The monotony of the London street in form and colour would be greatly affected if the roofs of buildings were designed so that a greater portion of them than is visible at present could be seen in the long perspective of a thoroughfare. The roof material keeps its colour and weathers better than any other part of the building.

Green tints of slates and the reds and browns of tiles, if more in evidence above the cornice or parapet, would do much to brighten the scene. The introduction of a single gable here and there is an excellent means of showing a flank of the roof, but the repetition of French, English, Dutch and Flemish samples all down the street effectually shuts out all roof colour from view.

There are many other details that would suggest themselves in working out a design if the central principle of arranging every part so as to allow of fullest exposure be kept in view. If this were done an improvement would soon be seen in the colour of the London street, although the effect would be far from what it might be, so long as ordinary building materials, as generally used, remain the medium for architectural expression. There would still remain the deleterious effect of narrow thoroughfares and cramped surroundings. The real problem to be solved resolves itself into the question, Is there a material suitable for use that will retain its colour or even present a semblance of pleasantness in a town atmosphere for a lengthened period of years? The porous and impressionable bricks and stones will not, and of terra-cotta my observation tends to show that unless highly vitrified its colour is marred by the visible coating of dust and soot, which in any case neither weathers into the material nor is washed off by the

rain. The more extended use of a glazed material then seems to me the only likely solution of the problem; but before our salvation comes from this direction a huge barrier of prejudice will have to be beaten down. The discussion to-night could not take a more useful turn than by examining the nature of these strong prejudices, to see how far they are based upon reasonable grounds.

In the first place, prejudice may arise from the fact that the ancient past has no precedent to offer to the use of glazed materials as we would use them. If it could be found in our Ferguson or Gwilt that such and such a basilica was so faced so many hundreds of years ago, London would be a bright and cheerful city to-day. The natural surroundings of the monuments of architectural antiquity did not demand an impervious facing to preserve their colour effect, and such materials were not used. If there is one thing more than another that the builders of old were particular about, it was the designing of their architecture to meet the needs of each particular case. It appears, then, as practical architects, if we would be strictly archaic, that our mission, as far as colour is concerned in London, is to design to meet the requirements of a dull and disintegrating atmosphere, and not for the environment of a bright and sunny clime.

Prejudice, again, may arise from the objection that glazed work is an unreal and unarchitectural material; as to the unreality, it is advanced that the material is not throughout all its parts the same as it is on the face. The glazing is stated to be an artificiality and a sham, a superior facing to a baser backing. I will not wade into the ethical reasoning that this statement provokes, as it might be difficult to get back into the shallows again; but I will say that to assert that any one material created for the use of man is in itself better or worse than another is saying that which cannot be supported by any logical process of reasoning. One material may be more useful in one set of circumstances than in another, but that is no criterion of the actual intrinsic merit of that material. The mere commercial value placed upon a commodity by the manufacturing and trading instincts of a community never can be a true standard of relative value of one material to another. If this reasoning is correct, it is wrong to say that a glazed material is a sham.

As to glazed work being unarchitectural, 'I will be content with the statement of the general principle that all materials within reach of architects that promise to serve the needs which call for their use are, lock, stock and barrel, architectural materials—whether Solomon of old or Jones of to-day has or has not used them.

So much for the objections prompted by sentiment. What are the practical arguments against the use of glazed work in the externals of our architecture?

First, the difficulty of treating the material successfully from the artistic standpoint. This I admit as a most real objection, but one that would vanish on the growth of familiarity with the possibilities and limits of the material. A bad design in glazed work is very bad. The effects presented by a large restaurant in Oxford Street and a small one in Buckingham Street, to the latter of which our President can testify, in themselves are enough to ruin the chances of a successful advocacy for the general introduction of this material for a long time to come, and the kindest thing to be said of these two instances is that they were experiments in a little known material. On the other hand, the example of Great George Street exhibits, I think it will be agreed, a very successful application. This is not an exclusive application, but it sufficiently indicates that the material in the hands of a capable designer gives a very pleasing effect. One drawback, namely, the play of light on the glazed surface, is not a serious one, for it is only seen from positions at very acute angles to the point observed, and as this position on looking up is two or three feet away from the base of the front, or on viewing sideways half-way down the street, the play of light does not obtrude; these positions, moreover, are not such as one would generally select to examine the colour effect of any front. More than this, the inevitable film, of which it is impossible to be rid, although very slight, is after a time sufficient to neutralise the play of light on the surface.

I would ask your attention for but a few moments longer for the purpose of following more positive reasoning in favour of the use of glazed work in architectural exteriors. Its extensive use for internal decoration in areas and in other positions where light and cheerfulness are required is sufficient justification, if any further is needed, for its unqualified use in street fronts. If I mistake not, the glazed decorations, whether as tiles or bricks in casings to columns, in panels and mouldings used as it has been in many of our largest clubs and public buildings, not to mention public-houses, is there to please the eye and cheer the spirits, and well it does this, too. Then why, in the name of common sense should the front-door mat be the uncrossable barrier that prevents the legitimate use of glazed work on the street front?

The application of glazed work to mouldings and enrichments is as suitable for external as for internal work, and, from

the maker's point of view, quite as practicable. The capabilities of the material would demand simple and dignified treatment rather than elaboration; and I am assured on inquiry that there is no practical reason why every part and detail of a front should not be built in glazed work. I do not think this exclusive application would be the best artistic treatment, but it is possible.

Assuming that the general use of glazed materials has come within the scope of practical politics, can we obtain that range of quiet, subdued and pleasant colours without which we shall not improve on the present condition of affairs? I will not say that the tints now in use are all that could be desired, but an intelligent demand would create a better and more varied supply. The white variety of glazed bricks might be considered too cold for artistic effect. Delicate cream colour, on the other hand, would appear suitable. A nice specimen of this tint may be seen in an unclosed internal area of the new Admiralty extension visible from Spring Gardens. Facework of this colour, with terra-cotta or stone dressings as a compromise, would, I think, make a pleasant combination. A very wide field for good and original treatment is opened by the choice of light and dark reds, golden browns, and other much less conventional colours.

It is too much, perhaps, to expect the older hands in the profession to be the pioneers in the field of glazed work. It is to the younger men, whose aspirations are not bound down by the iron bands of use and tradition, that the colour of London street architecture must look for its salvation. Unfortunately it is the experienced who would be the most capable of showing the world how glazed materials could be most successfully treated, and that they can be so treated already we have some visual evidence. But as in all else, I suppose we shall learn most by the failures. Sufficient evils must be choked in the weir before the live ones can slip over, and it will be our fate if ever glazed materials come into general use to experience many shocks before the eye will drink in satisfaction from a vista of good, cheerful harmonious colouring in glazed materials.

If the remedy for the present dismal colouring in the London streets does not lie in the directions I have indicated, and we would do our duty as a body of architects to our clients and to the community at large, the subject must be pursued further, until a remedy has been found that will enable us to bequeath to the generations to come a brighter and more cheerful city than it has been our lot to inherit from the architects of the past.

Mr. CRACE proposed a vote of thanks to Mr. Beale for his paper. One or two doubts had been left on his mind. He was not quite sure whether Mr. Beale advocated weathering or not. Weathering would not take place on glazed exteriors, though soot might dirty them. Half the colour of buildings was due to the kindness of nature, which, after the hand of man had done its best—or worst—came in and helped to put the building right. Though the London atmosphere was extremely destructive, we were not altogether losers. No one could pass St. Paul's Cathedral without being struck by the colour. He did not agree with Mr. Beale in recommending glazed exteriors. Mr. Beale had spoken of there being a prejudice against them which would not have existed if their use in ancient times could have been shown. In regard to stucco, that as a material belonged to antiquity. In this country architects had too often used stucco to represent some other material. If rightly used it was quite possible to colour it judiciously. Mr. Crace alluded to the premises of Messrs. Novello in the City, and the Alhambra, Leicester Square, as it was two or three years ago. Anyway, it must not be believed that their only salvation was in glazed work. Mosaic might be used on a large scale with good effect for friezes, courses, &c. Spain had been referred to. It was a bright and hot country, and bright colours would not be garish. In London, on the contrary, flags and bright colours under a cloudy sky produced garishness and want of harmony.

Mr. J. WALLACE RIMINGTON said he could not agree that any danger lay in having too much colour in this country, as he considered a northern clime could stand as much colour as a southern clime. In many cases effects of colour were created by reflection—technically speaking, by reverberation—though in reality there was actually little colour in the buildings. Mr. Beale, he thought, had been rather hard on terra-cotta. He agreed with Mr. Crace, however, that there was a legitimate field open for the use of paints, and that pigments might be used with success and employed to great advantage. It should be broken up—a certain amount of inequality or vibration obtained throughout the whole work. Much of the charm of old work was owing to this inequality in colouring. Mr. Rimington then alluded to examples in Toledo, Cordova, Seville and other cities in Spain, also to the Moorish examples in Granada, as to the good effects of irregularity in colouring, whereas modern work tended to too much regularity. In the best works colour was not applied so much in the highest lights, but rather reserved for the half-tones, and the

greatest richness kept for the dark lights. The deduction he drew was that colour should be employed in the shadows, and be sparingly used for the light parts.

Mr. E. W. WIMPERIS was not in favour of glazed work, though he advocated the use of colour. That Mr. Halsey Ricardo's building was charming in spite of a certain amount of glaze he admitted. He advocated more breadth of treatment in such buildings as the Natural History Museum. He was pleased to hear Mr. Crace's opinion that stucco could be used in a proper way, and lend itself under that condition to colour treatment.

Mr. CARÖE thought that London would be terrible if it were periodically to become a great washhouse, with fire-engine hose playing on buildings to wash the soot off them, and he thought Mr. Beale had got on a wrong tack in advocating glazed exteriors. He agreed with Mr. Wimperis, that both breadth and design was wanted for colour to be effective. Little bits were not desirable. Somerset House was a charming example of colour by weathering. As to Portland stone in London, no material weathered better. He certainly did not advocate the use of terra-cotta, a hard, unfeeling, soulless material that did not weather.

Mr. HALSEY RICARDO, being invited to speak, said that in clear atmosphere Time worked on the architect's behalf, flinging a brood of texture and colour over his work, but in manufacturing towns Time's hand was against the architect, and, with Time's permission, the corrosive gases of the atmosphere gnaw into and devour his building. Stones and bricks that were fortunate to weather themselves a century or more ago, when the air was purer, acquired then a face of flint which to-day defies the biting venom of our air, but we could not hope to build under such conditions. If, then, we were denied texture, we are driven with all the more force upon light and shade and colour. But, as Mr. Beale had pointed out, there were strong reasons against getting our shadows by projections. But by colour we could get the effect of shadow. Colours in English cities, where the light is dimmed by the smoke from manufactories, should be rich and full. Abroad, where the sun shines fiercely, we could use garish colours, because the glare of the sun and reflected lights gave gradation and modulation to crude tints, and the deep defined shadows produce supplementary colour harmonies. We were used to full rich colours. Our landscape is so, compared to the prevailing grey, dusty, pale landscape abroad. Bright light blanches colour; the time when colour is at its fullest and finest is in the gloaming. Absence of colour is felt by the most ignorant to be a want in our streets. On festivals our first impulse was to provide it by means of flags, streamers and flowers. What an animating spectacle was a troop of red-coats passing through the streets. One's pulse beats one hundred more to the minute. In the coming happier days let us hope that we may see carnivals in scarlet strutting with peacocks in every square, and squads of soldiers in uniform marching down our thoroughfares, and the Lord Mayor in his gilded barge and with his glittering retinue taking his daily stroll up and down the Thames. If we used colour we need not use mouldings. We can get our shadows and half-tones direct. Stone carving, stone, brick or terra-cotta ornamentation and mouldings were a mistake in a city like London. They were bound to perish miserably in the corrosive acids of our atmosphere, and whilst undestroyed are rendered ridiculous by the deposit of dust and grime. Mr. Beale had argued that, accepting the nineteenth century and the geographical and commercial position of London, glazed surfaces were what we should adopt. So he (the speaker) thought. Using them we renounce texture and the softened harmonies got by the lapse of time. But, as he showed, these were virtually unobtainable, no matter what materials we used. But with glazed surfaces we got colour, warmth and cleanliness. A brick house was a house built of sponge-cakes; the wind whistles through it, and after each rainfall some tons of water have to be vaporised before we could get our walls warm. Glaze the outside and we were windproof and wetproof. He did not know whether disease germs cling to brick walls—they probably did—but their attachment to a glazed surface must be more precarious. With glazed bricks, glazed terra-cotta and tiles, we had a most gorgeous palette to our hands. In one's musings of what one means to do in the blessed future, when patrons were trustful, and the fear of the contractor was removed from one's eyes, he saw rise before him the home of his ambition, like an opal in the sunshine, covered from basement to eaves with tiles of De Morgan's richest hues, and this jewel of a house repeats itself in shimmering radiance adown the street and space through the avenues of the New Jerusalem itself. Harmony was spoilt by repainting. Thirty per cent. of the wall front was window, so that the objection of the play of light was not serious. Windows were cleaned oftener than the house front.

Messrs. Pratt, Earle, Bannister Fletcher, Satchell, W. H. White and C. H. Brodie supported the vote, which was put to the meeting by the President and passed by acclamation. The proceedings then terminated.

KNUCKLE-BONE FLOORS.

AT the last meeting of the Oxford Architectural and Historical Society a paper was read by Mr. Hurst on the remains found in the excavations for the town hall and on the bone floor at Holywell. Concerning the latter he said:—

The discovery of a very fine example of what in Oxford is called a "knuckle-bone" floor, which fortunately had two dates upon it, attracted some attention in October last among our architects and antiquarians. Yet perhaps not quite enough, for the history of the Queen Anne style, supposing it to be such, will never be complete till a little more information is obtained regarding these Turkey carpets of the late seventeenth and early eighteenth centuries. Judging from the hundred-weights of bones thrown into back streams and into disused gravel-pits around Oxford, and from the fact that a wall of horns existed at Eynsham about forty years since, we may regard bones in those days as superfluous material, one ready to hand or purchasable for a song. The "rag-bone" man who now yells along our streets had clearly not come into existence, and the sooner his uncivilised method of collecting is abolished, the more credit to our local authorities. Floors of this kind have been tolerably numerous, but now they seem almost matters of tradition, so that it may perhaps be worth while to describe a good example like the present ere all memory of them has passed away. The floor of the front room of No. 19 Holywell was about 16 feet 6 inches by 15 feet 6 inches, not quite rectangular, giving an area of 255 square feet, and containing, by a computation based on these large rubbings, 24,460 ends of bones, those next to the knuckle. Some one who knows a little of osteology will greatly oblige by saying whether that number is to be divided by 2, 4 or 8 to obtain the number of animals that contributed. The bones were halved and embedded, broad ends upward, in fine gravel, and when fixed in position a mixture of thin lime and finer gravel appears to have been floated over the whole to give solidity and keep the surface light in colour. Whether hob-nails and street dirt, or rough sand and a rubbing-stone were used to smooth the surface could not be decided. In one place, left of the hearth, the projections of the bones were left untouched. The surface, however obtained, was equal to that of Roman mosaic without the monotony of its square tesserae; it was pleasant to tread upon, not so cold as stone, and much more durable than wood. The workmanship generally was most skilful, but the south portion had at some time been disturbed or had been left in a rough state for after modification. The borders, letters and figures were of calves' bones or those of small oxen; the dividing lines were smaller, and the filling-in was of mutton bones or of lamb, and a few of deer. It was in the singularly compact arranging of the last of these, rather than in the plan or design, that the beauty of the floor consisted. But we cannot say that we have the complete design before us, since the room may have been wider to the right than at present. In the initials the "R" is most probably the surname of the occupier, and "W" and "E" the Christian names of the husband and wife. The dates, 1701 and 1702, are easily recognised. The only surname at all reasonable is that of Robins, but Edward Robins was lessee under Merton "in the thirteenth year of Charles's reign." It may, of course, have happened that the same family lived there till 1701, but the houses had changed their numbers, and there is nothing as yet certain upon the point. Mr. Frederick King has sent me word that the same house was inhabited about 1820 by the Pinfolds, and that when the renowned Durham ox (for which 2,000*l.* had been offered) chose to break its thigh while being exhibited at the second Crown Inn, in the Corn Market, John Pinfold was summoned to kill and dress it. We found the bone floor under another one of oak, and a beam which supported the oak boards had on it some painting of Charles's time, as it seemed from the medium used. These floors have a whimsical interest for all who admire Thomas Hearne, for it happened on a day when that "elegant scriptor," as some one else calls him, was deserted by sobriety, if scandal rightly reports, he knelt down and kissed an example of this bone floor existing in the Antiquaries' Hall, regarding it as a genuine pavement of the Roman period. Members may be amused and may be grieved to see what a sorry plight he was in on that evening, as he went to Edmund Hall with two supporters who were not heraldic. Antiquaries' Hall still lives in Skelton, but has disappeared from Hythe Bridge Street. Its site is now occupied by four tall shops lying between the two tenements occupied by a coach-builder, the first of which is after the third house on the left when Hythe Bridge and the little one to its west have been crossed. It is, I think, this little bridge which makes the seventh of those on the Botley Road. I have been told that these bone floors are, or were, abundant at Elstow, John Bunyan's native place; that there was one in the grammar school in Wantage Churchyard, destroyed about 1850; the former Bear and Ragged Staff at Cumnor, which stood north of the church, had one; the girls' school in Beef Lane, also taken up; four or more of the houses near the Hamel, St. Thomas's, demolished to make room for the model dwellings;

half bones enough to fill a sack were taken this winter out of foundations near the chapel of the St. Thomas's sisters in the new part of Hollybush Row. Beneath Logic Lane, where the old Kybald Twychen crossed it, a piece of this flooring was discovered when putting up a scaffold-pole, and a trotter-shop on the site of the St. Giles's parish room had a modern specimen. Between Broken Hayes and the canal there stands a roofless cottage, apparently of the seventeenth century, which is said to have a floor of bones remaining, but that is inaccessible. Lastly, the portion of this museum, where the staircase terminates, had a row of this work round under its walls, which seemed to be part of the original work (the museum was erected in 1685), but removed when a stone floor was substituted. It would give me much pleasure to hear of others, especially of dated specimens, like this one from 19 Holywell.

THE GHIZEH MUSEUM.

THE Cairo correspondent of the *Times*, writing on the 7th inst., says:—The Council of Ministers, after discussing the question of the future of the Ghizeh Museum, have decided against incurring the expense of 130,000*l.* for its removal to a building which, it was proposed, should be specially constructed upon a more convenient site, and in favour of expending 60,000*l.* upon rendering the present building fireproof. As in either case the money must come out of the reserve fund in the hands of the Caisse de la Dette Publique, it is hoped that the authorities will only grant it for the construction of a suitable building, and not for the patching up of the present one.

The late excitement in England over the simple suggestion that the temples at Philæ should be removed furnishes material for an amusing comment upon the power of mere sentiment over reason. Not a voice has been raised for the protection of the immense and priceless collection at Ghizeh, which represents the civilisation of Egypt from the earliest historical period, although it is housed in a building that would be condemned as unsafe for the archives of any town in Europe. The walls, staircases, floors and roofing are a mass of dry timber with flue-like spaces between, admirably adapted for creating a draught, so that if a fire broke out the entire building would probably be burned down within a very few hours. Yet Egyptologists seem indifferent to a commonplace danger such as fire, which may happen at any moment to a museum worth any number of monuments such as the temples of Philæ.

If it should unfortunately be finally decided to attempt to render the present building fireproof there will be increased danger of fire and great risk of robberies taking place during the necessary operations, as well as risk of damage to the collection from the falling-in of the wretchedly-built walls. A further inconvenience would be that the museum would have to be closed to the public for a period of two or three years. Egyptologists should bestir themselves if they care to save the splendid Ghizeh Museum from the danger of becoming any day a mere memory of the past.

In reply to the statement, Mr. Poynter, R.A., sends the following account of the action which the Society for the Preservation of the Monuments of Ancient Egypt has taken in the matter:—As long ago as June 19, 1889, when the removal of the museum at Boulak to Ghizeh was first proposed, the committee of this Society submitted a memorial to the Egyptian Government on the subject, from which I extract the following:—

"Considering the importance of the historical documents and unique works of art contained in the Boulak Museum, this committee, while recognising the urgent necessity of immediately finding another site for the collection . . . regard with serious alarm the proposed removal of the museum to Ghizeh. The manifold dangers which would there threaten the collection arise (1) from the fact of the palace of Ghizeh being constructed of combustible materials, which, if once ignited, would speedily reduce palace and collection to a heap of ashes without the chance of saving a single object; (2) standing alone and near the desert, there would always be danger of robbers breaking in and carrying off the valuable series of jewellery and gold ornaments. . . . The committee, therefore, venture to hope that, before taking a step which is open to the foregoing objections, the Egyptian Government will reconsider the question, and whether it will not be possible to construct a simple fireproof building in a more accessible position."

The answer to this memorial was that the Egyptian Government had "no observations to offer on the subject," and the collection was soon in process of removal. At a general meeting of the Society, on March 14, 1890, held primarily to express indignation at the recent wanton destruction of famous monuments on the Nile, the subject of the inflammable nature of the buildings was again referred to by Mr. A. Jervoise Scott and discussed. In reply to what was then said, Lord Cromer, in a despatch which the Marquis of Salisbury was good enough to forward for the information of the committee, states that, having received privately a copy of

the report of the meeting, he had written to Sir Colin Scott Moncrieff as to the measures being taken to secure the contents of the museum from robbery and fire, and encloses the reply which he received from Sir Colin Moncrieff, adding that, in Sir Colin's opinion and his own, "the museum is far safer now than it was in its old position at Boulak." Sir Colin in his letter details the measures which had been taken to secure the contents of the museum—one of them being to turn out Zobeir Pasha and his Soudanese troops, who had been sharing the palace in dangerous vicinity to what your correspondent justly calls "the immense and priceless collection" which had been brought thither from Boulak. On these letters being read to the committee at a meeting in May, a resolution was passed "that the committee are of opinion that the collection at Ghizeh is still in jeopardy owing to the nature of the building, and venture to express a hope that as soon as money can be found by the Egyptian Government a suitable fireproof building may be erected." On July 9 a further letter from Sir Colin Scott Moncrieff was forwarded from the Foreign Office stating "that the measures necessary to secure the Ghizeh Museum from all danger by fire or robbery are not being neglected," and giving in more detail the precise measures which had been approved and were being put into execution; and on March 10, 1891, we receive further assurances that the Egyptian Government will not have done all that it ought to do "as long as we have not preserved from the risk of fire as far as is possible all the parts of the palace"; and in the despatch enclosing this statement it is considered that "the best solution would unquestionably be to build a fireproof building especially adapted for a museum." The Egyptian Government, therefore, from "having no observations to offer on the subject," had by that time arrived at the conclusion which our Society endeavoured to impress upon them nearly two years before; and we have understood that want of money alone has hitherto prevented the Government from setting about the construction of such a museum.

EXPLORATIONS IN GREECE.

THE Athens correspondent of the *Times* writes:—With the return of spring the time has arrived for the resumption of the excavations carried out by the various archaeological schools at Athens. Next week Mr. Ernest Gardner, the director of the British school, will begin operations on a new site—that of the temple of Apollo at Abæ. This sanctuary was the seat of one of the principal oracles of early Greece, and is mentioned by Sophocles ("Edipus Rex," 899) in a passage which seems to imply that it ranked with Delphi and Olympia as an important centre of worship. The oracle was consulted by Croesus and Mardonius, and according to some authorities was even older than Delphi. The site of the temple was recognised by Leake; and the remains now visible, though probably belonging to a later restoration, undoubtedly determine the situation of the ancient structure, which was destroyed by the Persians. Many antiquities are said to have come from this site; and a promising indication is supplied by Herodotus, who states that the temple was richly endowed with votive offerings. In addition to the excavations at Abæ, researches will be carried out by the British school in Cyprus and Asia Minor. The American school will resume the explorations on the site of the Heræon, near Argos, which yielded results of the highest interest and value last year. The operations will be superintended, as formerly, by Dr. Waldstein. The French excavations at Delphi will be continued under the direction of M. Homolle. The difficulties with regard to the expropriation of the peasants who occupied the ground have been overcome, and the exploration of this most important site can at last be carried out satisfactorily. The researches prosecuted by the German school on the western slope of the Acropolis will be continued under the skilful guidance of Dr. Dörpfeld. The Greek Government has given liberal assistance towards the acquisition of the land; and the excavations, which will probably extend over several years, will settle many disputed questions relating to the topography of ancient Athens. Explorations at Hissarlik will also be carried out, the requisite funds being supplied by the German Government.

THE PROPOSED MONUMENTAL CHAPEL.

THE following letter from Mr. Yates Thompson has been addressed to Mr. Shaw-Lefevre:—

26A Bryanston Square, W. : March 6.

My dear Lefevre,—I have noticed in the Press that exception has been taken in some quarters to the last two of the five conditions which I attached to my recent offer with respect to a monumental chapel in connection with the abbey of Westminster—the one relating to the class of monuments to which the new chapel should be open, the other personal to the donor. It is obvious that these last two conditions are of much less

importance than the first three, by which it is proposed, in effect, that the new chapel form part of the abbey; that provision be made for its maintenance without the imposition of heavy fees on the erection of monuments as at present; and that it shall not be allowed to become a lumber-room for existing monuments, which it may be thought well to remove from the abbey itself. To these three conditions I feel that I must adhere. The last two rest on quite a different footing, and should, in fact, not have been stated by me as conditions at all, but rather as suggestions.

As, however, they have evidently given rise to some misapprehension, and as their importance has been much exaggerated, I think it best simply to ask you to allow me unreservedly to withdraw them, with the observation that I had no intention or idea of presuming to exclude the monuments of naval or military men—any more than of other classes which I did not mention—but attempted merely a general definition of the character of the memorials which in the practice of the present generation have been erected in the abbey.

I may add that I fully appreciate the desirability of removing the houses in Old Palace Yard and Poet's Corner before arriving at any final decision as to whether such an addition as Mr. Pearson proposes should be made to the abbey, and I willingly prolong the term mentioned in my letter to any reasonable extent, so as to enable the purchase and removal of the houses to be effected.

Thanking you for your great courtesy in the matter, I am, yours sincerely,

H. YATES THOMPSON.

The Right Hon. G. Shaw-Lefevre, M.P., Office of Works.

GENERAL.

The Duke of Norfolk has contributed 3,000*l.* towards the cost of a new Roman Catholic church at Dorking, in place of the present structure, which was built in 1871 through the generosity of the late Dowager Duchess of Norfolk.

Messrs. Mosley & Anderson, of Northampton, have succeeded in the competition for the new Congregational church and schools, Kingsthorpe Road. The school block will probably be proceeded with forthwith.

Mr. S. Roberts, jun., has gained the prize of 20*l.* in the open competition advertised by the Devonport Town Council for the design of an ornamental lodge and park-keeper's residence. There were twenty competitors.

The Trustees of the National Gallery have acquired a diptych by Fra Angelico, representing *The Annunciation*. It was painted for the church of San Francesco, near San Miniato, Florence.

The Design by Messrs. A. Billing, Son & Rowley has been adopted for the branch library in Wandsworth Bridge Road, which is to cost 2,600*l.*

The Death is announced of Mr. J. B. Mitchell-Withers, architect, suddenly, at his residence, Eccleshall, Sheffield, on Friday night, aged fifty-seven. He had devoted many years to the study of church architecture, on which he was regarded as an authority.

The Painting Class of the Royal Hibernian Academy opens for the session on Monday next, when female students will be admitted for the first time in the history of the Academy to the advantages of study in the schools.

The Coventry Town Council on Tuesday, after an angry discussion, agreed that in order to provide the best arrangements for the police buildings without interfering with possible municipal extension in the future, premiums be offered of 150*l.* and 100*l.* for the two best sets of plans, which are to become the property of the Corporation, without binding them to employ the designer or to carry out any part of the work.

M. Adrien Rey, a pupil of M. Laloux, has been awarded the Prix Achille Leclaire by the Académie des Beaux-Arts, for his design for a sacristy.

Mr. Herkomer, R.A., has been re-elected president of the Royal Birmingham Society of Artists; Mr. Creswick, modelling master at the School of Art, was elected professor of sculpture, and the other professors and officers were re-elected. Mr. Herkomer has promised to deliver his presidential address in the gallery on the 29th inst. The installation of electric light throughout the Society's rooms is now completed.

The Whitechapel Picture Show will be opened on Tuesday, the 20th inst.

The London School Board, in order to secure a *locus standi*, intend to present a petition in opposition to the Bill of the London County Council consolidating and amending the Metropolitan Building Acts.

The Dean of Ripon has issued an appeal for subscriptions towards the proposed reredos for the cathedral, which Mr. J. O. Scott has designed, and which will cost between 3,000*l.* and 4,000*l.*

Mr. Aldam Beaton will read a paper on "Decoration" at the meeting of the Liverpool Architectural Society on Monday, the 19th inst.

The Architect.

THE WEEK.

ONE of the most interesting and attractive features in the Building Exhibition is a collection which represents the Royal School of Art Needlework, and was contributed with the approval of H.R.H. Princess CHRISTIAN. By means of the loan the council-room has been transformed. The embroideries were prepared for a small sitting-room, the entire construction and decoration of which were in the Elizabethan style. The *portière* curtains are of golden-brown plush with a design in the same style, introducing the national emblems and royal coat-of-arms, as was usual at that period—of course, the emblems in this case relate to the Victorian era. The window curtains of gold brocade with borders of plush and the frieze of grey silk were designed to correspond with the other decorations. The suite is evidence of the elegance which pervades the School, and has gained so much success for its productions.

WE suppose it may be taken for granted that the Government will take steps to acquire the land which will shortly be obtainable in order to enlarge the British Museum when necessary, and to diminish the risks from fire. There is no group of buildings in Europe which contains so varied a collection as the Museum, and it would, therefore, be difficult to say what class of inquirers would suffer most if a fire broke out in Great Russell Street. On each side there ought to be an adequate open space between the Museum and the surrounding dwelling-houses. As some of the leases of the neighbouring tenancies are about to expire, there can be no question about the duty of the Treasury. At the present time the Trustees of the British Museum possess about nine acres, and an additional area of five and a half acres can be obtained by degrees as leases drop in for 200,000 $\frac{1}{2}$. That area would provide for the requirements of many years. There may still be advocates for a division of the collections, but the advantages gained by the costly experiment of removing the Natural History Department to South Kensington are too insignificant to warrant the transportation of any of the remaining collections. At one time the House of Commons might object to the purchase of property, for some of the departments were managed on the system of the ordinary Government office, and the officials were ingenious in devising obstructions to keep the public aloof, but nowadays the facilities for admission to all parts are almost too liberal, for genuine students are hampered by them.

WHEN the ten tenders for the erection of the new General Hospital, Birmingham, were opened, it was found that the highest was 154,585 $\frac{1}{2}$ and the lowest 138,000 $\frac{1}{2}$. They were all much higher than the building committee had expected. It was considered that the committee would not be justified in recommending any of them for acceptance. They accordingly requested Mr. W. HENMAN, the architect, to prepare amended plans and specifications, and to make such modifications as were reasonably possible, with the view of reducing the cost. When this was done the amended plans were submitted to Mr. WATERHOUSE, R.A., the consulting architect, who reported that they related to alterations at the rear and sides of the building, including the omission of a laundry. They did not in any way affect the design of the front elevation, nor detract from the building in any way, and Mr. WATERHOUSE complimented the architect for the manner in which he had dealt with the difficulty. The committee further reported that Mr. HENMAN had undertaken not to make any additional charge for the amendments and alterations of the plans. Amended quantities were then prepared, and fresh tenders were invited from eleven builders. All had availed themselves of the opportunity except Mr. JAMES MOFFATT and Messrs. MOWLEM & BURT. A meeting of the committee and supporters of the hospital was held on Tuesday, when the tender of Messrs. BARNSELY & SONS was accepted. The foundation-stones will be laid by the Duke and Duchess of YORK in August or September next.

THE announcement of the death of Mr. HORACE FRANCIS, architect, at the age of seventy-three, will be received with regret. For many years his firm were associated with buildings in the Metropolis. Among their works may be mentioned Crosby Hall, Bishopsgate Street (reconstructed); the National Discount Company's premises in Cornhill; the buildings belonging to the City Offices Company, which cost 300,000 $\frac{1}{2}$, and eight of the branches of the London and County Bank. They were also engaged in the erection of the Grand Hotel, Hôtel Métropole at Charing Cross, and the First Avenue Hotel in Holborn. Messrs. FRANCIS were architects for several churches, including the parish churches of Ringwood and Warrington; three churches in Paddington, one being Christ Church, Lancaster Gate; and four churches in Hampstead. Among their mansions is Cooper's Hill, now used as the Indian College, which may be referred to as a remarkable specimen of Domestic Gothic with Italian details. The late Mr. FRANCIS was an enthusiastic entomologist, and had presented many specimens to the British Museum. As a lover of pictures, he was a familiar figure in the metropolitan galleries.

THE office of engineer to the City Commission of Sewers has been so well filled for nearly half a century by Colonel W. HAYWOOD, we can understand how the Commission must feel his withdrawal from some of his onerous duties. The Corporation have had no officer who was more faithful or competent. Unhappily Colonel HAYWOOD has had recently to suffer from illness, and a man in his position could not be absent for a week without causing much inconvenience. It has been therefore decided that Colonel HAYWOOD should be retained as consulting engineer and relieved from continued attendance at the Guildhall or the meetings of courts and committees; but in consideration of his services being at all times available when required his present salary of 2,500 $\frac{1}{2}$ a year is to be continued. The alteration will cause further changes, and an inquiry is to be made concerning the staff in the engineer's office and how the department will be affected by the proposed retention of Colonel HAYWOOD as consulting engineer.

At the meeting of the Church Extension Society on the 15th inst. a conference was held on the position and space required for organs in churches. The following gentlemen from the Society's committee of honorary consulting architects were present:—Messrs. W. BASSETT-SMITH, JAMES BROOKS, EWAN CHRISTIAN, T. GARNER, B. INGELOW, J. T. MICKLETHWAITE, J. P. SEDDON, R. NORMAN SHAW and ASTON WEBB, together with the following musicians:—Sir JOHN STAINER, M.A., Mus. Doc.; Professor J. F. BRIDGE, Mus. Doc.; Mr. E. H. TURPIN, Mus. Doc., and Mr. T. C. LEWIS. The question was referred to a sub-committee to draft suitable recommendations.

THE recent destruction by the London School Board of the old Palace of Bromley-by-Bow—one of the few remaining Elizabethan houses in London—and the rapid disappearance of the ancient buildings of greater London, has suggested to Mr. C. R. ASHBEE, M.A., the formation of a watch committee, acting in conjunction with the Society for the Protection of Ancient Buildings, and the compilation of a register in which all work of an artistic and historic interest shall be catalogued, and, in some cases, marked with a red star for possible preservation by local authorities. It is proposed—(1) To undertake the work experimentally for one year; to systematically visit the old buildings of greater London; to catalogue them in the register and on the map; to find out, if possible, who are their ground landlords and their leaseholders, and ascertain the length of the leases; and to discover whether the local public bodies in whose province they lie could be brought to preserve or utilise them for municipal purposes. (2) To confine the sphere of influence of the watch to a radius of twenty miles. (3) To form, if possible, during the preliminary year, a watch committee, preferably of residents in the area suggested. (4) To place the results of the year's work at the disposal of the S.P.A.B. The committee of the latter Society have expressed satisfaction with the scheme.

JOSIAH WEDGWOOD.*

THE position which WEDGWOOD occupies among English producers is remarkable, for it is unique. The pottery which bears his name, or at least the variety of which he was most proud, was not only originated but perfected by him, so that no improvement in it can be credited to any of the men who came after him. Rival potters have not attempted to surpass it. On his monument in Stoke Church it is recorded that he "converted a rude and considerable Manufactory into an elegant Art and an important part of National Commerce." The statement is not free from some of the customary exaggerations of the epitaph-maker, but in one sense they are suggestive, for WEDGWOOD helped to make English pottery so beautiful that it was sought after by foreigners as a treasure rather than for common use. A man like WEDGWOOD is therefore not unfitted to be the subject of one of the "Portfolio Monographs in Artistic Subjects."

It is not easy to explain his idiosyncrasy in a few words. Dr. WENDELL HOLMES appeals for sympathy with the mute MILTONS, for "those that never sing, but die with all their music in them." There are also men who have all the qualities of artists with the exception of the most essential—creative power. WEDGWOOD seems to have been one of them. We doubt if he could explain to a designer what he required by the aid of pen or pencil. But he was able to take bits out of different figures, and combine them in a way that surprised connoisseurs. Such compound figures, it should be remembered, were not bizarre things, but were classic in spirit. There was no man in the eighteenth century who possessed a more keen appreciation of the work of the Greek potters than WEDGWOOD; he had always a sort of ideal in his mind which was to him a standard, although he was incompetent to express its characteristics by lines or in clay. It enabled him, however, to be a severe judge of everything which came before him.

If he had been born in a higher class of society, WEDGWOOD was likely to have ruled among amateurs by his refined judgment, and he would have directed the Dilettante Society with success. Belonging to a family that had produced pottery alone and prospered in doing so, it was natural for him to remember that, from a manufacturer's point of view, pottery was a means of making money. Occasionally WEDGWOOD would gratify himself with the creation of such objects as the Barberini or Portland vase, which were profitable only in an indirect way; but in general he controlled all enthusiasm, and his manner of getting out heroic and mythological subjects was sometimes sordid rather than economical. He once, for example, gave an order to FLAXMAN to model three of the muses at half a guinea apiece. When he was satisfied that he had received full value for his money, WEDGWOOD gave a commission for the remaining six. From the three he divined FLAXMAN's intentions, and immediately he tried his hand at making up patchwork figures that would correspond with them. He calculated that by that process a muse would cost no more than five shillings. WEDGWOOD thereupon wrote in as much haste to FLAXMAN to countermand the order as if the sum involved meant thousands of pounds instead of thirty shillings. A good deal of the elegance which is the characteristic of WEDGWOOD's pieces was, strange to say, due to the parsimony exercised in his dealings with designers. His treasury of patterns consisted of engravings from Greek vases. As long as a bit of detail could be copied from one of those examples WEDGWOOD would not invest in original designs. He preferred, because it was cheaper, to imitate what was old rather than to utilise the imagination of the time. When it was necessary to have something original he took care that it was to be accompanied by bits of ancient ornament. In that way there was a limitation which made extravagance almost impossible. The artists had to keep within bounds, and as they had to work up to prescribed patterns, there was no chance of indulging in conceit. WEDGWOOD was, of course, a moral man, and, after being trained under him, it is no wonder that FLAXMAN used to deliver homilies about the advantages of humility and other virtues to young artists who called upon him.

One of the defects of the artist's nature in the eyes of professors of ethics is that they wish to have their names associated with their works. In WEDGWOOD's factory that sort of weakness was out of place. In order that there might be no temptation to the designers, he was good enough—for he knew his moral strength—to take all the admiration himself. A designer thus became as impersonal as one of the potter's wheels. They were both only instruments to carry out the projects of a superior mind, who would have preferred to dispense with both aids if any others that were cheaper could be discovered. Professor CHURCH, who is an official of the Royal Academy, in his monograph imitates his predecessors in putting forth a long "list of the chief modern artists whose designs or models were used by WEDGWOOD." It is an excellent device for blindfolding the public in order that they may imagine that WEDGWOOD was a munificent patron of artists. In the list we have the names of Sir JOSHUA REYNOLDS, CHARLES LE BRUN and a crowd of Italians. Why does not the Professor tell us what sums those artists were paid and identify the works which they designed? He says, indeed, that "in a considerable number of cases extant productions of WEDGWOOD's factory can be definitely assigned to many of the artists whose names are here recorded"; but Professor CHURCH must know that probably not one per cent. of the productions is in that category, since care was taken to conceal the extent of the assistance given by artists. According to him, WEDGWOOD "was not a mere employer of artists, not a mere translator into clay of designs made by other hands in other materials. Nor was he a mere copier of the antique. He possessed a marvellous power of co-ordination and adaptation, and appreciated the grace of congruity, although he occasionally allowed the association of incompatible decorative elements. He was endowed with an inventive faculty which revealed itself not only in new materials and methods, but in the origination of new forms." If put to the test of a comparison of WEDGWOOD's products, these words will be found to express the simple fact that the potter was possessed of a remarkable power of combining odds and ends of designs, and that in the nineteenth century, as in the eighteenth, his medley is assumed to be an origination of new forms. As regards WEDGWOOD there is little use in descanting on the defects of his system, and subsequent producers of the ware are not likely to depart from his precedents. But it is well for other manufacturers to remember that WEDGWOOD's example is dangerous, for they are never likely to repeat his success by combining scraps. He had the shrewdness to keep to a mock Classic style in his best work, for he knew that all modern attempts at classicism are most appreciated when originality is only to be discerned with difficulty. But that style is not for the multitude, and industrial art is always likely to be most profitable when it shows correspondence with the intentions as well as the demands of that time in which it was produced.

If considered as an organiser, a captain of industry, WEDGWOOD might be taken as an example which in these days, when so much is said about technical education, deserves attention. Born in Burslem in 1730, JOSIAH WEDGWOOD grew up among potteries. In his ninth year he was employed by his eldest brother, and became dexterous in "throwing." Five years afterwards he was apprenticed. As he was delicate he could not long work at the bench, and he was obliged to make himself useful in other ways. When his apprenticeship was ended he entered into partnership with two potters. As he was not satisfied he left the firm and spent a few years as a partner elsewhere. About 1758 WEDGWOOD set up his own works, paying a rent of £10 a year. He was a true work-master, one that laboureth night and day, and who was acquainted with all the details of the craft, from the selection of clays to the packing and forwarding of goods. But he perceived it was not advantageous commercially for his workmen to be as knowing as himself. As soon as possible he introduced the system of division of labour by which they became "hands." Professor CHURCH has to admit that, when looked at from the collector's standpoint, the change was not a benefit. He says:—"It is not to be denied that the methodic revolution which he effected in the technique of his pottery resulted in the loss of certain elements of value. The quaintness, the naïveté, the picturesqueness of the rough processes and

* *Portfolio Monographs: Josiah Wedgwood, Master Potter.* By A. H. Church, F.R.S. (Seeley & Co., Limited.)

products of the older days disappeared. Individuality was lost. The workmen became parts of a well-ordered and accurately-adjusted machine. The marks of human handiwork became unrecognisable. A tendency to aim at mechanical perfection and mere finish was developed at the expense of higher qualities."

One of WEDGWOOD's first improvements was a material for cream-coloured earthenware. If he possessed the chemical knowledge which is now easily obtainable, his labours in search of it might have been lightened; but he obtained a result that was at once appreciated. The interest of the ware was increased by calling it Queen's Ware. From cream-coloured ware he turned his attention to the "Egyptian black" ware, and his black basalt was well adapted for ornamental work.

At this time he had to encounter another difficulty. The design that was common at the time was not worthy of a fine material. Professor CHURCH says that "WEDGWOOD's encaustic paintings on vases and plaques have generally a depressing effect, and the ornament of his early work is not more exhilarating." WEDGWOOD had to train his designers, and the improvement in quality of their work was not less remarkable than in the preparation of clays. In treating of the latter Professor CHURCH has the advantage of being a chemist as well as a collector, and his chapters on the variety of WEDGWOOD's work have more technical precision than is to be found in costlier books.

WEDGWOOD realised that he was more likely to succeed with pottery of a sculptural than of a painted class. What was the use of toiling after material if it had to be concealed with colours? For reliefs as well as grounds the material could not be too well prepared, and it was always to be seen. The decoration might be ancient or modern, but every vase, plaque, cameo, bowl or pedestal was a testimony to the skill of WEDGWOOD in making mixtures of clays and other substances. We need not wonder that he carried on his experiments in the cellars of his house as if he were an alchemist or a preparer of one of the modern "resources of civilisation" for the destruction of society. Professor CHURCH cannot, of course, treat WEDGWOOD as a great chemist; and the science at that time could not have rendered him much aid in his inquiries, but "it may be freely conceded that in his knowledge of chemistry and of physics WEDGWOOD stood alone among the potters of his day." He was not disposed to sympathise with other labourers in the same direction. WEDGWOOD rejoiced when he found that RICHARD CHAMPION, of Bristol, had failed to manufacture true porcelain, although there was no direct competition between the two men.

The ill-health to which WEDGWOOD was subject may have increased his selfishness. Although with the help of his partner BENTLEY his cares in business were lessened, and he was able to retire in 1790, he did not reach his sixty-fifth year. His success should be an encouragement to many generations of manufacturers, for pottery is not the only class of work which can be extended and improved by steady and continuous application.

THE LONDON GUILDHALL.*

THE Guildhall Art Gallery, in which we are now assembled, was opened by Lord Mayor Staples in 1886. The average attendance of visitors is 56,000 annually. It has been enriched by many presentations, among the donors being several of the City Companies and members of the Corporation. Among the latter I am pleased to note two from members of my own Ward of Farringdon Within, one of which represents King Jeroboam's wife at the house of the blind Prophet at Shiloh, who tells her from Jehovah that her son, who is sick, will not recover (see 1 Kings xiv.). Recently it has received a munificent gift from Sir John Gilbert, R.A., consisting of sixteen important pictures, five being in oil and eleven in water-colours, the value of which is stated by competent judges to be 12,000*l.* Beyond the mere monetary value, however, is the consideration that in all probability this noble example will be followed by others. Indeed, one has already done so, and we have reaped the first-fruits of Sir John's liberality in the fine picture entitled *Salome Dancing before King Herod*. On two occasions recently the Gallery was occupied by a loan collection of celebrated pictures, admis-

sion to which was free, the whole attendant expenses being borne by the Corporation. The venture was exceedingly popular, the attendance in 1890 numbering 109,000, while that of 1892 was 236,000. An opportunity has been thus afforded to the general public of viewing works of art from private collections, which otherwise they could never have seen. Arrangements for a third exhibition are in progress, and the loan of many valuable works has been promised.

The library was originally established in 1425, mainly through the generosity of Sir R. Whittington, who was thrice (some say four times) Lord Mayor of London. In this laudable enterprise he was well supported by William Parry and John Carpenter, the latter of whom founded the City of London School. So keenly alive were our leading citizens to the value of education 450 years before Board schools were heard of. The library was originally attached to the ancient College of Guildhall. It remained intact until the reign of Edward VI., when the books were sent for by the Duke of Somerset, Lord Protector, with a promise that he would shortly restore them. No less than three cartloads of books were forwarded to the Duke, but whether he discovered their rare value and retained them, or from some other reason, certain it is the books were never returned. This library had a flourishing existence for over 100 years, and of the priceless MSS. it once contained not one volume is now known to be in existence, while the building itself perished in the Great Fire of 1666. From various causes no serious step was taken by the Corporation to re-establish the library until the year 1824. In that year the City authorities generously advanced the necessary funds, and the present library was opened June 1829. From 1,700 at the commencement, the volumes had increased to 10,000 in 1840, and now number 68,369, in addition to 38,075 pamphlets. The library has been found exceedingly useful, especially in the direction of technical education, help from the various works being readily obtainable whether for trades or professions. The building itself is 100 feet long, 65 feet wide and 50 feet high. It is fitted with handsome oak bookcases, forming twelve bays, into which the furniture can be moved when the space is required for State or other receptions. The handsome oak roof is supported by the royal arms, as well as those of the twelve great City companies. The large north window claims special attention. It was the gift of inhabitants of the Ward of Aldersgate, and is very beautiful. In the three upper centre lights we see Caxton and his printing press at Westminster, the central figure representing the great printer showing his work to Edward IV. In the three lower centre lights is seen Richard de Bury, Bishop of Durham, purchasing the library of the abbot of St. Albans for fifty pounds' weight of silver. There are also figures of Whittington, Gresham, Stow and Milton. Below is a representation of old Aldersgate. Appended is a list of rare books, &c., on view in the reading-room:—"French Chronicles," vellum, 1399; Dutch Bible, vellum, 1360; Koran; "Liber Fleetwood," 1576; Autographs, &c., of Lord Mayors of London from 1659 to present time; "Biblia Sacra Latina," vellum, fourteenth century; "Aldersgate Service Book," vellum, fourteenth century; Dutch Bible, 1477; "Biblia Sacra Latina," 1483; "Livy," 1485; "Nuremberg Chronicle," 1493; "Froissart's Chronicles," 1495; Higdon's "Polycronicon," 1527; Arnold's "Chronicle," 1502; Stow's "Survey of London," 1598; "Recreations of Master Zigzag the Elder;" Lyson's "History of London;" Thomson's "Chronicles of London Bridge;" Clarke and McArthur's "Life of Nelson;" "Coronation of George IV.," Hogarth; Roberts's "Holy Land;" Alphand's "Les Promenades de Paris;" "Fans and Fan Leaves," by Lady Schreiber; "Old Inns," by Edwards; "Streets and Canals of Venice." From the Museum:—A collection of City charters; Shakespeare's autograph; the sword surrendered to Nelson at the battle of the Nile, and presented by him to the Corporation with accompanying letter; the wooden tallies given by the City as security for moneys advanced for building London Bridge, 1825 to 1831; also a fine loan collection of watches belonging to the Watchmakers' Company, and a large assortment of coins, medals and jewels.

The crypt is 76 feet long, 45 feet wide and 13 feet high. It is remarkable for the perfect condition of all its members, arches and groins. For excellence of design, extent and soundness of construction it may be considered an unrivalled, and indeed unique, example of its kind. It was restored in the year 1851. On July 9 of that year the Corporation gave a grand and most successful entertainment to Her Majesty the Queen, the late Prince Consort and all those who took a foremost part in the first great exhibition in Hyde Park. The crypt was specially set apart to the service of Her Majesty as a supper-room. Upon oaken sideboards was displayed the valuable plate of the several City companies. Around the columns policemen were stationed, clad in armour obtained from the Tower, each holding in his hand a torch by which the crypt was lighted. The western portion was filled with trees, vines and flowers, among which hundreds of singing birds were let loose, thus giving the appearance of a forest glade in summer time. The whole structure forms part of the ancient

* A paper read by Mr. C. J. Cuthbertson at a visit of the United Wards Club to the Guildhall.

Hall, erected in 1411, and fortunately escaped the Great Fire. Any paper upon a building so ancient as the Guildhall, and withal so rich in civic and historical interest, must necessarily be imperfect. Of its earliest history few authentic particulars can be obtained. According to the most reliable accounts the original Guildhall dates back to the year 1189 or thereabouts. The present hall was commenced in 1411, in the twelfth year of Henry IV. Between these dates few particulars can be ascertained. We are indeed told that it was enlarged in 1326, in the reign of Edward II., and that one Thomas de Mayrns, chamberlain, "was rewarded for his pains and diligence about the repair of the Guildhall in the years 1341 to 1343." The present fabric was raised largely by the liberality of the Mayor (Sir Thomas Knowles), the aldermen, and the several City companies. When their resources failed, fines in aid were levied upon the citizens for ten years, while moneys received for the pardon of offences went to swell the building fund. Much public interest was felt in the enterprise, and King Henry V. granted the City "free passage by land and water" for the necessary building materials. The windows were glazed by the aldermen, each placing his coat-of-arms in coloured glass in his own work. The executors of Sir Richard Whittington paid a handsome sum toward paving the hall with hard Purbeck stone. Various additions and alterations to the structure were made from time to time, but, with the exception of the crypt and a portion of the walls, the whole was destroyed in the Great Fire.

The appearance of the hall during the conflagration is thus described by an eye-witness:—"That night (September 4, 1666) Guildhall was a fearful spectacle, which stood, the whole body of it together, in view for several hours after the fire had taken it, without flames (I suppose because the timber was of such solid oak), in a bright shining coal, as if it had been a palace of gold or a great building of burnished brass." We need not follow the history of the time-honoured building during the next two centuries, except to remark that, according to some authorities, the renowned Sir Christopher Wren had some share in its subsequent reconstruction. Under the direction of the then City architect, Guildhall was brought to its present condition in 1864, and in the following year the beautiful open-timbered roof, which forms so attractive a part of the building, was completed. This roof is as nearly as possible framed to resemble that destroyed in 1666. The hall itself is 152 feet long, 49½ feet wide and 89 feet high. Of the stained-glass windows the following deserve notice:—1. That in the east end was presented by the operatives of the cotton districts in acknowledgment of timely assistance rendered to them by the City in the hour of need. The Relief Fund raised at the Mansion House during the crisis caused by the American Civil War reached over 500,000*l.* 2. That in the north-west corner represents the following:—William the Conqueror holding in his hand the first charter granted to the City of London; Henry I. presenting a charter to the City; Richard I. granting a similar charter; Edward VI. presenting charter of four royal hospitals. 3. Another commemorates the freeing of 5,500 acres of Epping Forest by the Corporation for the free use of the public for ever. We must not omit a passing reference to the familiar figures of Gog and Magog, which were made and put up by a City carver in 1708. They measure 14½ feet in height, and took the place of two old wickerwork giants, which were formerly carried in Lord Mayor's processions. Amongst the monuments may be mentioned that of (1) the Duke of Wellington, costing 4,966*l.*; (2) that of Lord Nelson (inscription by Sheridan), costing 4,442*l.*; (3) the Earl of Chatham (inscription by Edmund Burke), costing 3,421*l.*; (4) William Pitt (inscription by Canning), costing 4,078*l.*; and (5) Lord Mayor Beckford. Standing in the Guildhall, the mind is easily carried back to the many and important events that have occurred here from the days of the Edwards to those of Victoria. A long series of sumptuous entertainments to royal and distinguished persons have been given within its walls. From these we make a selection. Edward II. here partook of the City's hospitality to commemorate the birth of a prince. The proceedings are thus described in a record of the time:—"The Mayor and the aldermen assembled at the Guildhall, together with the good folks of the Commonalty, and from thence they went to St. Paul's. After service carols were sung in the church to the sound of trumpets, and then each returned to his home." The day was proclaimed a general holiday. In May 1357, a banquet was given in honour of John King of France and Edward the Black Prince. Early in the fifteenth century Henry V. was entertained to commemorate his victories in France. Being short of cash, this monarch pledged a portion of his jewellery to the Corporation for a sum equal in our day to 10,000*l.* Amongst His Majesty's creditors was that worthy citizen Richard Whittington, whose generosity to his sovereign is thus described:—"In his last Mayoralty, King Henry V. and Queen Catherine dined with him in the City, when Whittington caused a fire to be lighted of precious woods, mixed with cinnamon and other spices, and then taking all the bonds given him by the king for money lent, amounting to no less than 60,000*l.*, he threw them into the fire and burnt them,

thereby freeing his sovereign from debt. The king, astonished at such a proceeding, exclaimed, 'Surely never had king such a subject,' to which Whittington replied, 'Surely, sire, never had subject such a king.' In 1641 Charles I. was entertained by Lord Mayor Gurney, and in 1653 Cromwell dined at the Guildhall and knighted the Mayor. Charles II. frequently dined here, and on one occasion we are informed that Lord Mayor Viner and the company generally passed the bounds of decorum, a charge which it would be difficult to prefer in the present day. So attractive to the "Merry Monarch" was a Guildhall banquet that he dined here nine times altogether. In 1689 William and Mary came to see the Lord Mayor's Show, and, together with "both Houses of Parliament, the Privy Councillors, Judges, Ladies of the Bedchamber, and other ladies of the chief quality," dined at Guildhall in the evening. His Majesty, with his Queen, repeated the visit in 1692. In 1702 Queen Anne was entertained by Lord Mayor Vintner. In 1727 George II. and his Ministers dined with Lord Mayor Becher, and remained to the subsequent ball. In 1761 George III., with Queen Charlotte and the royal family, came to view the show, and afterwards to dine with Lord Mayor Fludyer. William Pitt was also present. The Lord Mayor and aldermen waited upon the royal guests, who showed their appreciation by remaining until the small hours of the morning. His Majesty was known to remark, "To be elegantly entertained we must come to the City." In 1806 seven of His Majesty's sons were entertained by Lord Mayor Shaw, while in 1814 Lord Mayor Sir William Domville gave a banquet to the Prince Regent and the Allied Sovereigns before the Battle of Waterloo. The sumptuous feast was served on plate valued at 200,000*l.*, the banquet itself costing nearly 25,000*l.* On Lord Mayor's Day, 1837, Her Majesty was entertained by Alderman Gowan, and as before hinted, in 1851 a splendid entertainment was given to the Queen, the late Prince Consort, and a distinguished company. The Jubilee of Her Majesty's reign is still fresh in the public memory. A reception was then given in the Guildhall to the whole of the royal family and Her Majesty's royal guests, who were welcomed to the City by the Prince and Princess of Wales. A very hearty welcome was also given in 1891 to the Emperor and Empress of Germany, and in 1893 to the King and Queen of Denmark. On the former occasion Her Majesty rightly interpreted these hospitalities by remarking, "I consider this not a City reception, but a national reception." Every citizen will echo this sentiment, believing that in these functions the Corporation in some measure acts the part of the national host. In closing this hurried review of the festivities here offered by the Corporation to Royalty and others we are aware that some regard such entertainments simply as a means of personal gratification only, and even accuse the City of wasteful extravagance in these matters. We, on the other hand, venture to think that by inducing our reigning sovereigns, our statesmen, judges, naval and military heroes, and other distinguished sons and daughters of Britain to accept her hospitality, the City has received and conferred a distinct benefit, for the oftener the rulers and the ruled can meet together under healthy social conditions, the more sturdy will be the people's loyalty and the more stable the sovereign's throne. We pass on to remark that in the Guildhall are presented the freedoms and thanks of the City to those whom the citizens deem worthy of honour. Among such presentations during Her Majesty's reign may be noted that to the Prince of Wales in 1863, that to the Duke of Edinburgh in 1866, that to the Duke of Connaught in 1870, that to the late Prince Leopold in 1875, that to General Grant in 1878, that to the late Prince Albert Victor of Wales in 1885, and quite recently to the Right Hon. W. Lidderdale, late Governor of the Bank of England, in recognition of splendid service rendered by him and others in preventing what otherwise must have been a widespread financial calamity. Having looked at the brighter, we must not omit a brief reference to the darker associations of the Hall. For upholding purity of election at the Guildhall Chaucer was deprived of office and sent to the Tower. Here, too, the Duke of Buckingham, after the death of Edward IV., endeavoured to win over the citizens to obtain the throne for Richard. Here, in the reign of Henry VIII., noble Anne Askew was tried, and after being racked, and refusing to recant, was burnt at Smithfield. Here, too, in 1546, the Earl of Surrey was tried on a charge of high treason, condemned and beheaded on Tower Hill. Passing from Guildhall to the Council Chamber we note in the lobby the paintings symbolising the armorial bearings of the City and Livery Companies (the gift of Sir Stuart Knill, Baronet). The new chamber was begun in 1883, and the first meeting was held in it October 1884. It was built from designs by the City architect. There is sitting accommodation for the Lord Mayor, twenty-five aldermen, the high officers and 206 common councillors. Galleries are provided for the public and the press. We next visit the alderman's room, the richest apartment connected with Guildhall. The ceiling is noticeable for a painting by Sir James Thornhill. This apartment is used for the sittings of

the Court of Aldermen, who form the bench of magistrates for the City. Each alderman's chair bears his name and coat-of-arms.

In conclusion, we may perhaps be pardoned in claiming that by helping forward the younger generation of our citizens, and fitting them to occupy worthy positions in life, our library has done a useful and even noble work. As for our venerable Guildhall, now more than 500 years old, we think of its past with pleasure, not only because during all these centuries it has been the happy and fruitful meeting-place of sovereigns with the people, but also because it has been the field upon which the battle of right against might has been successfully waged by our citizens. May the Corporation of London, whose cherished home is their Guildhall, long continue. For many centuries—as its records prove—it has laboured for the public good, and, all assaults notwithstanding, we trust that, with powers unimpaired, those labours may long be directed to the increased advantage of the City and the good of our common country.

THE ACOUSTICS OF BUILDINGS.

A LITTLE note which was published lately in this journal about the acoustics of buildings, having been reprinted in the *American Architect*, has drawn the following remarks from Mr. John Lyman Faxon, architect, of Boston:—

I noted in your issue of November 11 last, page 80, a clipping from the *Architect and Contract Reporter* giving the rule for a cross-section of an auditorium—as a principle of good acoustics. The said citation assumes (its general intent, as I take it) that the said rule is of universal nature, applicable in all cases. It is not so, and it suggested to me that a few words upon the subject might not be wholly uninteresting to your readers.

This is not intended by any means to be an essay on acoustics—both space and time forbid—but simply to state in as few words as possible why the rule or principle referred to is misleading, and will not answer in all problems, and to outline some of the primary laws and elements which enter into a problem of acoustics, such as I have considered and followed in my own practice, with gratifying results.

1. As to the rule above noticed: if the same is of general application, then auditoriums, churches, theatres, music-halls and the like would have to be of much less height than they now are, otherwise they would not be good acoustically (which some are), or the platform or stage would need to be much elevated above the average level, and the ceiling of the barrel-vault type. For, according to this rule, in an auditorium (theatre, for instance) 78 feet wide and 65 feet high—an average size—the speaker's mouth (the phonic centre) would need to be 26 feet above the floor. We know that such is not the need. On the other hand, assuming this rule to be in force, an auditorium 78 feet wide would call for a height of about 47 feet 8 inches.

The fact is that the rule referred to is one of minor importance—applicable, with good results, under certain conditions, but not at all necessary under other conditions; these other conditions affecting this special rule vastly more than it can possibly affect any given case. Acoustic results depend almost as much upon knowledge of the various materials entering into the construction and finishing of an auditorium, as upon a thorough knowledge of acoustic laws governing the propagation, reflection, or augmentation of sound.

I know of no science in connection with our art of architecture in which the truism of the old saying "A little knowledge is a dangerous thing" bears more directly than in this matter of acoustics, and the average practitioner will need to go but a short span over the road of research which I have travelled to convince him of this.

2. Assuming that the genesis of sound is of right quality, *i.e.* as to purity and normal intensity, whether of speaking or music, oral or instrumental, there are certain fixed laws which govern its transmission and diffusion, and certain elements which affect its purity, harmony and right hearing, and briefly they are stated as follows:—

- (a) Pure air and a normal temperature of 70 deg.
- (b) Uninterrupted transmission.
- (c) Sympathetic, *i.e.* harmonious, vibration.
- (d) Minimising of reflection.
- (e) Prevention of echo.
- (f) Diminution of sound when necessary, *i.e.* when the size of the auditorium is considerably within the limits of natural radiation.
- (g) Augmentation of sound when necessary, *i.e.* when the size of the auditorium is considerably in excess of the limits of natural radiation.

As to natural radiation of sound: the Greeks well understood its phenomena, and the plans of ancient theatres are laid down accordingly (as to which the reader is referred to Stuart & Revett's "Antiquities of Athens," Vignola, Sanders,

and an interesting work in Italian, "L'Acoustica," by Antonio Favaro-Torino), and may be briefly stated as follows:—Inscribe an area with a circle having a radius of 60 feet; then placing the phonic centre, *i.e.* the speaker, 30 feet from the periphery, the sound (*i.e.* of normal speaking pitch) will be heard 90 feet directly in front of the speaker, 30 feet back, and 52 feet 6 inches directly upon either hand; in other words, a row of hearers standing in line around the periphery will hear the speaker with equal distinctness in pure air at 70 deg.; as the hearer recedes from—gets outside of—the periphery, so will his sense of hearing decrease, or, in other words, the sound fail to reach him.

As to (a) transmitting medium: the velocity of sound is conditioned upon the elasticity or density (purity) of the medium, air—the greater the elasticity the greater the velocity; the greater the density (impurity), the less the velocity. Sound travels faster in warm air than in cold, and at a rate of 1,130 feet a second in pure air at 70 deg.

The clearness and purity of sound is conditioned upon the equality of its vibratory transmission, and this equality of vibration can only be maintained in air of equal elasticity and purity; so that uniform temperature and purity of air is one of the first essentials for the equal transmission of sound, not only in spots but throughout every portion of an auditorium.

This condition can only be obtained by a perfect system of heating and ventilation, and such a system should help, not retard, transmission. If the direction of the heating or ventilating currents is towards the stage, transmission and vibration will be retarded and *vice versa*; the direction of such currents should be along with the direction of the sound-waves.

As to (b) uninterrupted transmission: free space should be provided for the transmission between the genesis of sound and the auditors; solid features, like columns, partitions, balcony fronts, &c., should be rigidly avoided; balcony fronts should be of perforated iron or woodwork (wood is best), to prevent reflection and to admit of the sound-waves passing through and being absorbed by the clothing of the audience; and in the case of partitioned boxes, as in an opera-house, the partitions should be on radial lines from the phonic centre.

As to (c) sympathetic, *i.e.* harmonious, vibration: the propagation of sound is by multitudinous waves sent out in all directions from the genesis of sound (a simple illustration is afforded by dropping a pebble into water, though this is not an accurate illustration, inasmuch as the sound-waves do not expand in the form of rings, but rather in the form of millions of lines having wave-motion in transmission). These waves or lines have an undulatory or vibratory movement of periodic extent and amplitude, and this extent and amplitude of the wave is governed by the force, intensity, pitch or initial vibration of the particular note creating its corresponding wave in the air. Consequently, (1) the air must be in a condition to vibrate sympathetically with the initial vibration, and (2) as the waves are of periodic extent and amplitude, it is necessary that the dimensions or scale of the auditorium shall coincide in every direction, as far as possible, with the extent or scale of the vibratory motion or waves. For instance, the French standard pitch *C*, of 512 vibrations per second, propagates a wave whose extent is $2\frac{207}{1000}$ feet; therefore it follows, if this note *C* is taken as the "fundamental note" of the auditorium, the scale upon which such an auditorium must be designed must be of a unit of $2\frac{207}{1000}$ feet, and the shape of the auditorium should conform to the extent or end of the numerous radiating waves in musical progression, *i.e.* in a ratio of 5, 6, 7, 8, 9, &c.; and if this ratio of proportion is adhered to, the forces of impact of the waves upon the enclosing surface (or in other words, the force of reflection from such surface) will be equal in all parts and reflection may be prevented. Further, the form of the ceiling should not be flat, but curved, but the line of this curve cannot be any curve or series of curves which the architect may think "looks well," but is determined by the height of the centre of the ceiling above the floor and its distance from the phonic centre, and this initial curve will not coincide with the plane of transverse section of the house, but must coincide with the plane of a line or wave radiating from the phonic centre to the centre of the ceiling. The acoustic faults of the Trocadéro at Paris are almost wholly due to the faulty lines or shape of the ceiling and the stage opening—being of such contour as to aggravate reflection and to concentrate reflected waves at certain places in the house.

As to (d) minimising of reflection: this is an element which can hardly be set forth clearly in writing; (1) because even a slight variation of the lines of an auditorium will change the angles and force of reflected waves; (2) because reflection will largely depend upon the nature of the materials used in finishing and decorating the interior, a most important consideration, of which knowledge can only be gained by experience, observation and study; but the following general principles may be stated: (a) that hard or smooth surfaces reflect more and with greater force than rough or soft ones; (b) that the angle of reflection is the same as the angle of incidence; (c) that reflection will be more powerful within limits considerably less than

those stated in the seventh paragraph, and less powerful when the limits exceed those stated as aforesaid; (d) that much study needs to be given to the shaping of the plan and the elevation of walls and other parts, to prevent reflected waves coming in contact with direct waves; (e) that balconies, if properly designed, are a great help in preventing reflection, their lines depending on the distance from and height above the phonic centre, and their projection from the walls; and utmost care should be taken that the height of wall back of and above the upper balcony be so designed that waves may not be reflected from said wall to the ceiling, and as before stated, the balcony-fronts should be in all cases open-work, not solid.

Care should also be taken that the plan, section and opening of the stage (the focus of genesis) are of such contour that direct waves will not strike the ceiling forward of the centre, *i.e.* between the centre and the stage wall or proscenium.

As to (e) prevention of echo: what I have observed in the fore part of the preceding paragraph holds good as to echo; no fixed rules can be written as to its prevention. Echo is due to reflection and to the intensifying quality of resonant materials injudiciously placed. Possibility or probability of echo can only be determined graphically by laying out the direct waves, reflected waves and succeeding reflections.

As to (f) diminution of sound: it will be easily understood that there will be a preponderance of sound (of given intensity) in an auditorium, say, 60 feet in diameter over one of 120 feet diameter, and that the force of reflection will be much greater; it is therefore necessary to so construct and finish the auditorium that resonance will be reduced and reflection prevented.

As to (g) augmentation of sound: it will be easily understood that there will be a diminution of sound (of given intensity) in an auditorium, say, of 240 feet diameter inferior to that in one of 120 feet diameter, and that the force of reflection will be much less; it is therefore necessary to so construct and finish the auditorium that it will be of augmented resonant quality; sometimes powerful resonators are necessary, as, for instance, a sounding bell below the floor of the auditorium. The stage also must be planned and constructed in the form and nature of a great resonator, so as to augment the genesis, timbre or power of sound.

These elements of transmission, reflection, echo, diminution or augmentation of sound are of vital importance in any attempt to design an auditorium to be a success as regards acoustics, and demand of the architect not only something more than a superficial knowledge of acoustic laws but also a knowledge of the influence of the various materials which he may be led to employ in the construction and finishing of an auditorium, and the manner in which such materials may be used to the best advantage.

TESSERÆ.

Smoky Chimneys.

CHIMNEYS, especially kitchen chimneys, frequently smoke from their being too small; in the chimney-pot being too small to allow the free passage of the smoke from a kitchen or other large fireplace. Chimneys frequently smoke from their being too short, as in attics, for although the openings for the stoves in that part of the house are usually small, which is an advantage, the flues have not power to contend against the dense air at the top and the various currents and eddies occasioned by the wind. A large opening of fireplace, that is to say, an opening disproportionate to the size of the chimney is an evil. As water passes more slowly (which is perceptible) through the wide part of a river or stream than it does through the narrow, or under a bridge where the piers, &c., reduce the waterway, the same quantity of water having to pass, so kitchen chimneys with large openings at bottom are more disposed to smoke than those with narrow ones, as the air in entering them, being dispersed over so large a space, the current is not sufficient to carry up the sooty particles with it, and allows much to fall in the room. The air will, however, pass more freely under that part of the chimney-breast that is immediately beneath the upright shaft, and the range or grate should be so constructed for the fire part to be as nearly as possible at that point, *i.e.* towards the right or left of the fire-opening as the shaft may be. It is not said with reference to the front part of the grate being forwarder than the shaft. Chimneys frequently smoke from being in a cold situation, as in an external wall with only the thickness of half a brick between the flue of the cold or damp atmosphere, which is very usual in detached houses, also in low outbuildings where the chimney is carried up alone above the roof and all sides exposed to the cold, or against a wall with three sides exposed. In the case of a low chimney being near a high building, the air, passing over the high building, will drop like a waterfall upon the low chimney, or when blowing strong from the contrary point against the high building will rebound and form an eddy upon the top of the low chimney,

and thus impede the free ascent of the smoke from the same. Two or more fireplaces to one flue, which, unless very judiciously arranged, is nearly certain to cause smoke, and likewise the want of a proper supply of air. Large rooms having two fireplaces, or drawing-rooms communicating by doors—if one flue is in a warmer stack than the other, or has a stronger fire kept in the fireplace, that one will take away the necessary supply of air from the other or weaker one, and cause the smoke from it to descend into the room, and should there be no fire in the second grate it will even draw the smoke down that chimney from the surrounding chimney-tops to feed that one fire and flue. Many chimneys are called "dreadfully smoky" where the fires are seldom lighted, except in the evening, as is frequently the case in bed-chambers and dressing-rooms. Another annoyance from smoke is sometimes occasioned by the relative situations of the doors and windows in the room, by which the current of air from a door or window, having an outlet at another door or window, creates a sort of whirlwind and drives the smoke out of the fireplace into the room before it reaches the chimney-breast, as if bellows be used to a fire obliquely the smoke and flame will be driven to the contrary side of the grate, the flue having no control over the smoke, which is driven away by a strong current before it reaches the chimney, as the air to supply the flue will pass immediately under the chimney-breast, while the smoke is carried away by an under-current into the room. Another and a very prevailing annoyance is the smoke from an adjoining chimney, or from one in an adjoining stack passing down the flues that are entirely out of use, or at the time that there is not any fire in them. It is not uncommon for chimneys to smoke at the sudden shutting of a door, especially in well-fitted rooms where there is an inadequate supply of air. When a door is opened inwards it presses the air towards the chimney, and when suddenly shut the air is drawn back from the chimney into the room, and this will generally produce a puff of smoke. Many chimneys smoke from not having been properly cored at the time of the building of the house.

Versailles under Louis XIV.

The palace of Versailles was only an enlargement of a hunting-box that Louis XIII. built on a slope, where a windmill had once stood. An army of 36,000 men cleansed marshes and cut down wood to make room for Mansard's miles of magnificence. Le Brun had decorated this work of gorgeous prodigality with frescoed ceilings, where nymphs soared and floated, and where demi-gods struggled and struck attitudes. Le Notre had filled the gardens with all the wonders of French and Dutch horticulture. The marble limbs of writhing deities shone, like golden images in the sun, through veils of silver water, thin and transparent. Through the avenues of the orangery, where the gold fruit of the Hesperides glowed among the green, glossy leaves of Spanish orchards, the chiming cadence of a thousand fountains was heard. Here Bacchus rode exultingly, attended by a train of laughing satyrs. And here Flora tossed in the air handfuls of exulting flowers. Here a pyramid of molten silver revived the recollection of the alchemist's wonders. There stood Ceres holding her wheat-sheaf, while Cupids hand-in-hand circled her round with mocking eyes, as if exulting in the loss of Proserpine. Here the Siren sat on the rock, harping to the too guileless mariner, while all round sea-monsters belched arches of water from their throats that fell with uninterrupted harmony back into the marble basin, where the coloured bubbles chased and ran round and round, and where, through the water, could be seen the gold-fish of China, like enchanted things, crowding in jostling shoals, as the ladies threw them food or frightened them, in order to see their golden flash and scud as they flew off down to a safer depth. The fountains of Bacchus, Apollo, Flora, Ceres, the Dragons and the Sirens were well-known points of interest in the gardens, of which the most beautiful spots were the Allée d'Eau, where courtiers walked for a long way down a broad gravel avenue between rows of fountains, the orangery, the balustraded terrace leading by broad flights of steps bordered by fountains, and the two grand avenues lined with trees, and beyond all these knots of flower-beds was the great court, with open railing, where the sentinels stood, within which, and beyond the moat, lay the vast palace with its Ionic pillars, clock turret, statues and trophies, its stone urns and high-pitched roofs. Great gilt coaches, large as arks, were moored in the court. Sedan-chairs were there, with their sturdy bearers resting on the handles. Groups of courtiers and ladies filled the walks or stood bantering each other round the fountains. Lacqueys ran about excitedly, longing for orders, fresh from card-parties in rooms hung with tapestry or encumbered up to the ceiling with formal giants and demonstrative allegories.

Church Planning.

The usual division of a church into the nave and side aisles appears to have had its origin not in symbolism but in fitness. In vaulted churches the span from wall to wall would be excessive, and large buttresses would be required to resist the thrust of the vaulting; and a similar difficulty would be experienced

with the timber roof at a time when constructive carpentry was in a very low state. But the division of the span into three intervals removed these difficulties, and the introduction of the clerestory windows assisted the illumination of the building. The accession of dignity which was thus gained was an accidental accompaniment of this constructive excellence, not the essential feature of the design, to which economy, stability and convenience—in a word, fitness—was to be sacrificed. If, however, we examine most of the churches built since the accession of the Tudors, we find this principle of fitness, and of the subserviency of appearances to convenience of plan or constructive excellence, egregiously violated. St. Paul's Cathedral is a remarkable example, for here, as has been well observed, "one half of the church is built to conceal the other." Here the architect has been so faithless to his great scientific talents, and so unaware of the source of true architectural effect, as to conceal all his constructive resources and to mask his transcendent abilities, as though he was ashamed of his glorious handiwork. The division of the church into a nave and side aisles involves the introduction of intermediate supports—a necessary evil in those days, and but little felt in a service whose influence was so dependent upon ceremonial observances, the effect of which would be rather heightened than impaired by such an arrangement. But in Protestant churches, particularly amongst the Dissenters, the interest of the congregation is concentrated upon the pulpit and the reading-desk. It is desirable, therefore, that the audience should have an unimpeded view of the officiating clergyman; and intermediate supports should be avoided, as they either conceal the pulpit from a portion of the audience, or else, if placed in the aisles, impede the passage or necessitate the loss of space. The introduction of the essential features of one class of religious edifices into churches whose ceremonial is independent of such accessories is in bad taste, as suggesting discordance and controversy where harmony and unison are most desirable. In like manner, the formation of niches without statues, and where there is no probability of statues being provided at any time, is objectionable, as suggesting a feeling of incompleteness where, in fact, all is done that is intended. And thus that which is an agreeable feature when justified by its application to legitimate purposes—*i.e.* when fitly introduced—becomes by its misapplication evidence of the architect's want of resource and taste.

Francia the Painter as a Type-cutter.

From the invention of printing to a period not far removed from our own time the cutters of punches were goldsmiths, minters, niellists—consummate masters in the art. We find in Zani that Fust and Schoeffer were goldsmiths, as it is thought Gutenberg was also. Zani is also of opinion that Giovanni Dunne, "bravissimo orifice," was he "who led the way in forming types of metal." Emiliano Orfini, of Foligno, the partner of Numeister, was a minter, and of a family of minters. Bernardo Cennini, who cut the punches for the types with which the "Servio" was printed at Florence in 1471 and 1472, was a goldsmith, and Jensen was a minter at Tours before he became a cutter of types. Pomponio Gaurico, in his little work "De Sculptura," printed for the first time in Florence, in 1504, mentions as celebrated engravers two of his contemporaries, Caradosso and one Franciscus Furnius Bononiensis. What other writer has even spoken of a Francesco Furnio or Forni Bolognese, an artist equal to Caradosso? Mariette ("Traité des Pierres Gravées") made a good guess when he condemned the name of Furnius as an error, and suggested that it ought to be read "Francia." Every one knows how distinguished Francia was in goldsmith's work, his first and principal profession, and how often he signed his pictures with the words "Franciscus Francia Aurifaber" or "Aurifex." Vasari, in his "Life of Francia," says that his beautiful medals will bear a comparison with those of Caradosso, but he says not a word of the imaginary Furnius of Gaurico. There is no doubt that Francesco da Bologna was no other than Francesco Raibolini Bolognese, commonly known as "Il Francia." Camilli Leonardi, in his "Speculum Lapidum," after having named various ancient sculptors precisely in the same manner as Gaurico, proceeds to speak of the moderns, and says, "I find one process among the moderns of which no mention is made among the ancients, in speaking of the engravers or sculptors in silver, which species of sculpture is called niello. I know a man very celebrated and extremely skilful in this art, named Franciscus Bononiensis, otherwise Frazza (Frazza or Franzam), who draws or engraves on one small globe or plate of silver, so many men, animals, mountains, trees, castles, and in such different ways and positions as is wonderful to be told and to behold." Francesco Raibolini, then, was known in his time as Francesco da Bologna or Bolognese, otherwise Francia or, in the Bolognese dialect, Franza. The direct testimony of Leonardi is corroborated by an irrefragable and remarkable circumstance. In the preface to his "Petrarch" Francesco da Bologna promises to print in a similar style and type the Italian poets

and also the Latin classics. Nevertheless, we have from him only five little volumes—four Italian and one Latin, which is the last in chronological order, and bears the date of December 20, 1516. It could not be otherwise, for Francia ceased to exist on January 5 or 6, 1517. Francesco da Bologna was, therefore, Francesco Raibolini, called "Il Francia," the worthy contemporary and compatriot of Leonardo, Raphael, Michel Angelo, a great painter, great engraver, great minter, great niellist, an unequalled cutter of types for printing, a conspicuous ornament of illustrious and learned Bologna.

Indian Mortar.

The lime used in India is peculiar and is called "khunkur." It is picked up in the beds of rivers and small streams after the rains, and is found sometimes in isolated beds; but generally it is in detached masses composed of pieces of about the size that stone is broken for metalling roads. It is of a light grey colour, and is burnt in the usual way, either in heaps or in kilns, the latter being preferred; and the percentage obtained is generally about 55 per cent. The mortar used is generally made of 1 part of lime to 1 or 1½ parts of "soorkee," which consists of bricks pounded and passed through a sieve of eight meshes to the inch; this mortar is of the best description, being hydraulic, and setting almost better in water than out of it. No sand is found in India sufficiently sharp for making mortar, hence the use by the natives in the first instance, and now by Europeans, of brick-dust, as it may be called, in place of sand for making mortar.

The Circular Saw.

One of the most useful machine tools that made its appearance at the end of the eighteenth century was the circular saw. This had been applied to cutting metal on a small scale, as in the cutting-engine, ever since the time of Dr. Hooke—if, indeed, these early examples were not more like circular files than saws. Where or by whom the wood-cutter's saw was put into the form of a revolving disc has not been recorded. It found its way into this country about 1790, some say from Holland, and was employed at Southampton and elsewhere in wood mills. Bentham greatly contributed to the practical arrangements necessary to give it a convenient form. He describes and claims the bench now universally used, with the slit, parallel guide and sliding bevil-guide and other contrivances. Brunel introduced a variety of ingenious and novel arrangements, as well as the mode of making large circular saws of many pieces. Mr. Smart also contrived series of sawing-machines for making canteens, cutting tenons, &c.

The Discovery of The Mausoleum.

When the Knights of St. John had arrived at Mesy (Budrum), they at once commenced fortifying the castle, and looking about for stones wherewith to make lime, found no more suitable or more easily got at than certain steps of white marble, raised in the form of a terrace (*perron*) in the middle of a level field near the port which had formerly been the great Place of Hali-carnassus. They therefore pulled down and took away these marble steps, and, finding the stone good, proceeded, after having destroyed the little masonry remaining above ground, to dig lower down in the hope of finding more. In this attempt they had great success, for in a short time they perceived that the deeper they went the more the structure was enlarged at the base, supplying them not only with stone for making lime, but also for building. After four or five days, having laid bare a great space one afternoon, they saw an opening as into a cellar. Taking a candle, they let themselves down through this opening, and found that it led into a fine large square apartment, ornamented all round with columns of marble, with their bases, capitals, architrave, frieze and cornices engraved and sculptured in half-relief. The space between the columns was lined with slabs and bands of marbles of different colours, ornamented with mouldings and sculptures, in harmony with the rest of the work, and inserted in the white ground of the wall, where battle-scenes were represented sculptured in relief. Having at first admired these works, and entertained their fancy with the singularity of the sculpture, they pulled it to pieces and broke up the whole of it, applying it to the same purpose as the rest. Besides this apartment, they found afterwards a very low door, which led into another apartment, serving as an antechamber, where was a sepulchre, with its vase and helmet (*tymbre*) of white marble, very beautiful and of marvellous lustre. This sepulchre, for want of time, they did not open, the retreat having already sounded. The day after, when they returned, they found the tomb opened and the earth all round strewn with fragments of cloth of gold, and spangles of the same metal, which made them suppose that the pirates, who hovered along this coast, having some inkling of what had been discovered, had visited the place during the night and had removed the lid of the sepulchre. It is supposed that they discovered in it much treasure.

NOTES AND COMMENTS.

WHAT appears to be a new system of architectural competition has been introduced in New South Wales. An enterprising tailor in Hay announced that, as he could not design a building to advantage, he wished to have drawings of stables and sheds to accommodate eight horses, three carts and two buggies. He offered in return a suit of clothes selected from his stock. The plans which were successful were marked "12 years' experience." The *Building and Engineering Journal*, of Sydney, in commenting on the case, says:—"It almost seems as though the profession had successfully passed the late serious crisis in its affairs, which has seen the best of men almost starving, and that the near future promises a return to the primeval system of exchange, with the happy freedom from professional usages and Institute rules which mark this most important event. Colonial tweeds will improve in demand surely. The next thing we may expect to hear of in this line is that some publican in the same thirsty region advertises for plans and supervision of building operations, and offers in return so many daily potations of tanglefoot, or overproof rum." Apparently, the suit of clothes is to be taken from the ready-made stock, and the tailor ought at least to have the courtesy to announce he would take the measure of the architect. It is a pitiful case, but it indicates that building owners in Australia as in Great Britain have a knowledge of the state of the professional market, and are resolved to profit by the excessive supply.

AN architect's certificate is always treated with befitting reverence in a law court, and the wit of man does not appear to have discovered any device by which it can be set aside. A coach and six can, it is said, be driven through every clause of every Act of Parliament if a driver of the right sort can be secured, but no king's or queen's counsel with the aid of a troop of horses can make a certificate less binding on the parties concerned in it. A few days ago it was decided in the Matlock County Court that an architect cannot diminish the value of the document by any subsequent statement. A firm of builders claimed 19*l.* 6*s.* 7*d.* as balance of account for additions to one of the numerous hydropathic establishments in that charming district. It appears that the extras on the contract, as certified by the architect, amounted to 259*l.* 16*s.* 7*d.* The builders agreed to accept 250*l.* if the money were paid at once. A sum of 240*l.* was given to them. As they could not obtain the balance they were obliged to sue for it. The defendants pleaded that the contract was not stamped. The judge overruled the objection on the ground that there was admission of the work being done, and, moreover, the architect had certified it was finished. The architect was then brought up to testify about some work being still incomplete, and how he had told the builders not to present the certificate until all was carried out to his satisfaction. In reply to the judge, he admitted that the certificate was not entirely accurate. The judge said there was no getting over the certificate, which declared that the work was complete in September last. It was right to withhold some money for unfinished work, but the acceptance of 250*l.* for an account amounting to over 259*l.* was evidence that a sufficient allowance had been already agreed to on that head. His Honour, therefore, held that, in addition to the 7*l.* 7*s.* 3*d.* lodged in court, a further sum of 10*l.* must be paid. The amount in dispute was not large, but the decision that an architect cannot explain away his own certificate is important. We believe the only judgment to the same effect has been given in the Supreme Court of New York.

A COMMITTEE of the Bolton School Board lately came to the conclusion "that only the architects of Bolton who have already had experience in building modern elementary day schools be allowed to send in plans for the proposed Central Higher Grade School; and that premiums of 50*l.*, 25*l.* and 10*l.* respectively be paid to the architects whose plans are awarded first, second and third places in order of merit, the first sum of 50*l.* to be merged in the architect's commission if those plans are accepted." When the subject came before the Board for confirmation a discussion arose. One member proposed as an amendment that the recom-

mendation should be rejected, on the ground that as there was to be an assessor there was no necessity to limit the number of designs, which would be also unfair to the younger members of the profession. The Chairman of the Board said he had tried to have the competition still more restricted, viz. to architects who had received commissions from the Board, and he related how the architect of the Department had pointed out the disadvantages of open competitions. A majority of the members were in favour of the amendment. The proposal confirms what we said last week about the endeavour of local authorities to escape from work that is troublesome to themselves. The building committee were eager to have few plans, but the Chairman and his friends wished for fewer still. It may be offered as an excuse that the members of the Board are not paid for their services. That argument does not, however, apply either to the assessor or to the architect of the Education Department. If any advantage could arise to the public from allowing only a favoured few to compete, the arrangement would find general support; but when it is manifest that paid and unpaid officials are merely eager to spare themselves, means should everywhere be adopted to baffle their scheme. As long as plans are prepared without cost to Boards, it is the least we may expect that they should receive attention.

THE example set by the Office of Works and some municipal bodies in dabbling with contracting is being imitated in places where it is not necessary to bid for the votes of the working classes. A new example is the Mersey Docks and Harbour Board. At a late meeting the following recommendation of the works committee was brought forward:—"To raise the quay on the north side of the Egerton Dock, Birkenhead, and to erect thereon a corrugated iron shed 570 feet in length and 80 feet in width, with the necessary lines of rails, and a roadway 20 feet in width in connection with the proposed shed, at a total estimated cost of 13,350*l.*; and to raise a portion of the quay on the north side of the Hornby Dock and to erect thereon a shed 900 feet in length and 150 feet in width, with certain hydraulic cranes, and a roadway 50 feet in width, adjoining the shed, at a total estimated cost of 51,500*l.*" It appears that the committee were not agreed whether the work was to be tendered for or carried out by the Board without a contractor. The Chairman, in introducing the proposal, said that, as one who watched dock work closely, he should not be at all surprised, if the whole of the work were done by tender, to go down some morning and find the shed and the quay in the middle of the dock. It would not be the first time such a thing had happened. He went on to say that since he had been Chairman of the works committee they had often accepted tenders, and although they naturally accepted the lowest tender, he had felt more than once that they were acting injudiciously in doing so. From the facts before him he thought the Board would make a great mistake in accepting a tender in the present case. An amendment was proposed to the effect that tenders should be obtained for the erection of sheds on the north quay of Hornby Dock, and it was carried by a majority of one. It is quite evident that a prejudice is being created against contractors, and as the societies appear to be indifferent to the allegations, we must not wonder if the public are coming to the conclusion that contractors are incompetent and rapacious and that economy will be insured by dispensing with them.

THE spring exhibition of the Manchester Academy of Fine Arts closed on Saturday last. Forty-six pictures of the value of 960*l.* were sold. The next exhibition of works of modern artists will be opened on September 4, closing on Saturday, January 5, 1895. It will comprise paintings in oil and water-colour and sculpture only, pastels, architectural drawings, and works in monochrome not being admissible. The art gallery committee will have professional assistance in the selection and hanging of the works. The sum of 2,000*l.* per annum, with the net profits arising from exhibitions, can be employed by the committee for the purchase of works of art for the permanent collection, and during the last eleven years the sum of 31,145*l.* has been so expended.

Mar: 23rd 1894.





THE AGE OF NEW REFORMATION

FROM A PICTURE BY J. M. W. TURNER, IN THE COLLECTION OF THE NATIONAL GALLERY, LONDON.

By William von Haubach.



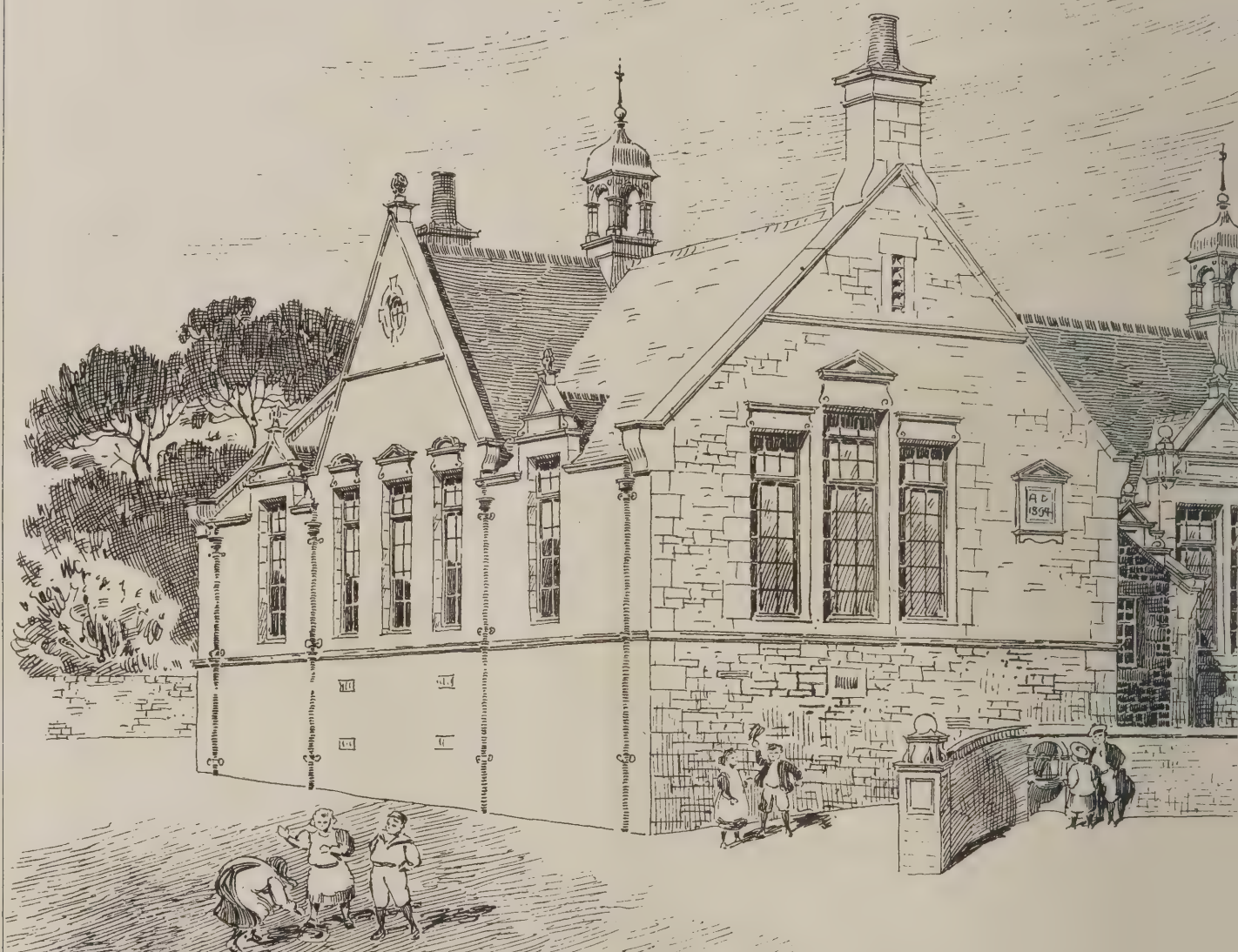
PHOTOGRAPHED BY BEDFORD LEMERE & CO

Mar. 23rd 1894.



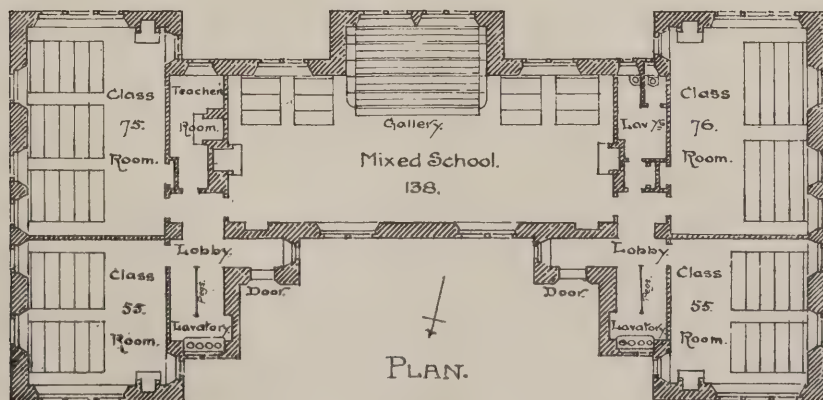
INX PHOTO SPRACUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

AD: GARDEN FRONT.
& PETO, Architects.



• Infants' • School • Armadale • for 400 •
• BATHGATE • LANDWARD • SCHOOL • BOARD •

J. Graham Fairley, F.R.
Architect



ILLUSTRATIONS.

TUDOR HOUSE, HAMPSTEAD.—GARDEN FRONT.

NEW SCHOOL, ARMADALE, WEST LOTHIAN.

IN the plan of this school it will be seen complete cross ventilation is provided for, and there is the minimum of occasion for using one classroom as a passage from another. The cost will be about 2,500/. The builders are MESSRS. WILSON & WALLACE, West Calder, and Mr. WEBSTER, Bathgate; and the architect is Mr. GRAHAM FAIRLEY, Edinburgh.

THE AGE OF THE REFORMATION.

THE painting which is the climax of KAULBACH's series in the Berlin Museum presented more difficulties than the others. In the first place he had to determine who were the best entitled to be considered as the representatives of the Age of the Reformation. On that subject he was not likely to find many scholars who would agree. In England, some half-dozen men at the most would be put forward as the motive powers of the Reformation. But our insular simplicity would not satisfy the humblest classes of the Germans, who are aware in the first place that LUTHER and CALVIN, with their associates, took up the contest which had been commenced long before they were born; and secondly, that the theological combatants were only a part of the great army engaged. A broad view of the Reformation necessarily made a choice of figures still harder. As the painting was to be seen mainly by Germans, it was necessary to emphasise the share taken by their countrymen, not only on both sides among theologians, but also those who fought under the banners of art, science and literature. At the same time, justice demanded that the services of Italians, Frenchmen, Dutchmen, Englishmen, &c., should be suggested. As space could not be limited to Germany, so time must include a wider era than the age of LUTHER and CALVIN. Accordingly we find that KAULBACH introduces ABELARD, the schoolman, who was born in 1079, and WILLIAM HARVEY (the discoverer of the circulation of the blood), who was born in 1578. CALVIN and LUTHER did not live much beyond a half century, whilst KAULBACH's Age of the Reformation extends over five centuries. He is no less uncircumscribed in respect of creeds, for a Jesuit is seen in the foreground, and there is a liberal supply of the advocates of the papal and other conservative principles throughout. The important conclusion which GOETHE says should be drawn from the struggle is a conviction that the World-spirit is tolerant, and therefore many things which are essentially opposed to one another can and must exist side by side. KAULBACH was probably of the same mind when in the very centre of his painting he makes MELANCHTHON unite in friendly embrace with the Lutheran and the Imperialist envoys over the agreement for peace concluded at Augsburg. When KAULBACH had at length decided on the figures that were to form his quadrivium of theology, art, literature and science, the next question was how he was to arrange them. He does not conceal that he was indebted to the *School of Athens*, for he introduces a sketch of that work in RAPHAEL's hand. LUTHER takes the place of PLATO, and HANS SACHS the seat of DIOGENES in the older picture. On the upper platform are the theologians and some of their pious supporters, on the right are the artists, on the left the followers of astral science, while in the foreground are the scholars and writers and the students of terrestrial science. We shall now endeavour to indicate the individuals who are represented.

On the seats which flank the copy of DA VINCI's *Last Supper* are early reformers. The bearded patriarch at the extreme end on the left is JOHN WYCLIFFE, who was taught in Merton College, presided over Balliol, and held the living of Lutterworth. The painter did not know that WYCLIFFE always wore a coarse russet gown and went barefoot. Next to him is GEILER VON KAISERSBERG, one of the mystics who preached in Strasburg. His discourses have still some literary interest, for many of the ideas were derived from BRANDT's "Narrenschiff" (Ship of Fools). He is seen pointing out a passage in a book to JOHANN WESSEL, of

Gröningen, a monk who is described by HALLAM as "one of those who contributed most steadily towards the purification of religion, and to whom the Greek and Hebrew languages are said, but probably on no solid grounds, to have been known." The unfortunate JOHN HUSS touches WESSEL and points towards LUTHER. He suffered at the stake for upholding WYCLIFFE's doctrines, although protected by the emperor's safe-conduct. The stout Rabelaisian figure at the other side of the central picture is PETER WALDUS, or VALDO, the Lyons merchant, whose followers are now known as Waldenses. He is talking with ARNOLD of Brescia, who, like HUSS, suffered at the stake. Beside ARNOLD is his master, PETER ABELARD, the great logician who said of himself, "I preferred the armour of dialectic warfare to all other modes of philosophy; for it I quitted the military life, choosing rather the conflicts of disputation than the trophies of real battle." The figure with the uplifted arm is the Dominican Friar SAVONAROLA, the Florentine martyr. Like so many of the reformers, he could not appreciate the Renaissance spirit, and he exerted his influence against literature and art. In one of his discourses he said, "In the houses of great prelates and great doctors nothing is thought of but poetry and rhetoric. You will find them with books of polite literature in their hands, with VIRGIL, HORACE and CICERO to prepare themselves for the cure of souls." Divines might be less profitably engaged than with the classics, but to a severe man like SAVONAROLA intellectual enjoyment is a crime. Last comes JOHN TAULER, another Dominican, and the best known of the fourteenth-century mystics. According to WACHLER he was the first that wrested from German speech the fit expression for ideas of moral reason and emotion, and has left riches in that kind such as the zeal for purity and fulness in our days cannot leave unheeded.

In the centre of the next row stands LUTHER, who elevates the Gospel as a pharos. On his right is his faithful friend JUSTUS JONAS; on the left, holding a book, is ULRIC ZWINGLI, who claimed to have anticipated LUTHER in the demand for reform. The minister who gives sacramental bread to four Rathsherren, counsellors or elders, is JOHN CALVIN. Awaiting their turn are Admiral COLIGNY, who is in armour (the bent head recalls MACAULAY's line, "Good COLIGNY's hoary hair all dabbled with his blood"); MORITZ of Saxony, in a plumed beaver (a prince who thought only of the main chance, for, as CARLYLE says, he "kept his Electorship, and by cunning jockeying his Protestantism too, got his junior line pushed into the place of the first, in which dishonourably-acquired position it continues to this day"), a Huguenot gentleman and a French peasant. Then we see the English contingent advancing. Queen ELIZABETH leads the way, and is followed by DRAKE, BURLEIGH and ESSEX; a monk, an old man helped by a boy, and another man, represent the English people. CRANMER appears as a tall figure carrying a Bible; behind him, with clasped hands, is Sir THOMAS MORE. The two figures approaching the dais towards the centre of the painting are WILLIAM OF ORANGE and his councillor OLDEN BARNEVELDT.

On the right of LUTHER we see JOHN BUGENHAGEN, one of the translators of the Bible, offering the cup to two Saxon princes. The elder, JOHANN der Beständige, is described by CARLYLE as "a wise and eminently Protestant man, though dreadfully fat, so that they had to screw him up by machinery when he wished to mount on horseback." The son, JOHANN FRIEDRICH, der Grossmüthige or Magnanimous, who wears his cap, was not fortunate in this world, for, says the historian, he lost the Electorship, and his line "split itself after him into innumerable branches, who are all of a small type ever since." The three figures behind are Rathsherren. The clerical bearded figure, with folded hands, is Hochmeister ALBRECHT of Brandenburg, who "early shone in his exercises, spiritual and bodily, above all his fellows, expert in arts, especially in arms," and from his appearance was made Grand Master of German knighthood. Some thought he was a sham; but, although much given to theology, and therefore bewildered in casuistry, he contrived to overturn the knighthood of which he was Grand Master, and to gain possession of Prussia for his family, the HOHENZOLLERN. CARLYLE's sketch of him as "a man with high bald brow, magnificent spade-beard, air much

pondering, almost gaunt—gaunt kind of eyes especially, and a slight cast in them, which adds to his severity of aspect," corresponds with KAULBACH'S figure. The brave-looking man in armour will at once be recognised as GUSTAVUS ADOLPHUS. To the majority of Britons he probably becomes interesting because the redoubtable Major DALGETTY served under him as Fahndrager, and was always ready to extol the invincible monarch, the bulwark of the Protestant faith, the Lion of the North, the terror of Austria.

In the sort of chancel aisle assigned to astronomy we see COPERNICUS, the Prussian, drawing a diagram explanatory of the Pythagorean system he revived, in which the planets were proved to turn round the sun. His book, which was printed in Nuremberg in 1543, was dedicated to Pope PAUL III. The "starry GALILEO," who adopted the system, is seen leaning on his telescope. On one side old TYCHO BRAHE, the Dane, is discussing a problem with JOHN KEPLER and a monk. At a table is seated JEROME CARDAN, the algebraist, physician, naturalist, astrologer, who was one of the chaotic spirits of the sixteenth century. Ascending the stairs is GIORDANO BRUNO, who upheld the infinity of the universe and the plurality of worlds, which were ascribed to the operations of an abstract principle which was the soul of all things. According to WHEWELL, he probably had a considerable share in introducing the opinions of COPERNICUS into England. In this country, as in France, BRUNO was safe, notwithstanding his pantheism, but on returning to his native country, Italy, he was seized as a heretic and was burnt in 1600.

The right aisle becomes the studio of ALBERT DÜRER, who is supposed to be engaged in painting his figures of the Apostles. He turns round at the announcement of his colour-grinder about the arrival of visitors. Who are they? THACKERAY says that he should like to have been SHAKESPEARE'S shoeblack, and to have run on his errands. In a similar spirit, KAULBACH has painted himself as DÜRER'S colour-grinder. The visitors he announces are no less than DA VINCI, RAPHAEL and MICHEL ANGELO. PETER VISCHER, who is at home there, looks on in the attitude in which he appears in Nuremberg. Here also we find the printing-press. GUTENBERG, of Mentz, is supposed to have pulled a sheet of his Mazarin Bible, which he has affixed to a column. LORENZ KOSTER, of Haarlem, who is believed by many investigators to have been the original inventor of the art, stands beside him holding a forme in his left hand, and the original "printer's devil" (he is now only a Lauffbursche) looks on admiringly at the product of his inking.

The transition from the printers to scholars and humanists is easy. The group which represents literature is unlike the others, for it is hard to say who is the supreme figure in it. On that account it is, perhaps, more characteristic of authorship. We see ERASMUS with outstretched hand expounding CICERO. Beside him, as if ready to take his place, stands REUCHLIN, who was as well versed in Greek and Hebrew as any man in the fifteenth century. PETRARCH seems to be no less anxious to have the merits of HOMER appreciated. It may be doubted whether the sonneteer and lover of LAURA was competent to be a professor of Greek. ERASMUS said that PETRARCH did not possess full acquaintance with the language. In his letter acknowledging a copy of "Homer" that was sent to him from Constantinople, he said:—"HOMER is dumb or I am deaf; it is not in my power to enjoy the treasure. As often as I embrace the silent volume I exclaim with a sigh, 'Illustrious bard, with what pleasure should I listen to thy song if my sense of hearing were not obstructed?'" The listeners consist of SHAKESPEARE and CERVANTES, who are far more illustrious than the teachers, besides PETER DUMOULIN MOLINEUS, a French Protestant divine, who, from his head-dress, might be taken as belonging to CHAUCER'S age, although he lived up to 1658, and the versatile CREBS, or CASANUS, who was geometrician, theologian, diplomatist, and won a cardinal's hat. He was a Frenchman, and his countrymen believe he revived the Greek theory of the revolution of the earth before COPERNICUS. Next to him is the laurel-crowned and mail-clad ULRIC VON HUTTEN, who, like KÖRNER in the nineteenth century, was a soldier as well as a poet, and is therefore one of the favourite figures in modern German decoration, as he is one

of the idols of German students. Seated on the ground in front of SHAKESPEARE is HANS SACHS, shoemaker and Meistersänger, of Nuremberg, or as the old doggerel expressed his versatility:—

Hans Sachs, der war ein Schuh-
Macher und Poet dazu.

About his productivity there could be no question, for it is recorded that he left behind him two hundred and eight plays, seventeen hundred comic tales and between four and five thousand lyrics. Near PETRARCH is JACOBUS BALDE, the Jesuit. Fortunately for his reputation somebody styled him the German HORACE, and accordingly he is represented as trying to awake the ancient lyre. HALLAM, who had the courage to read the eight books, says the odes are tumid and unclassical. On the other side of PETRARCH is PICO of Mirandola. The late Cardinal NEWMAN, in explaining the effects of the excitement of the Renaissance, speaks of him as "a youth of twenty, who exhibited himself at Rome as the master of twenty-two languages, and proposed nine hundred subjects for disputation." But, astonishing as may have been his ability, there is nothing left by which its value can be tested. As a collector of manuscripts he was most easily deceived, and spent a fortune on rubbish. Looking towards him is seen the head of VIVES, the Spaniard, who was professor at Oxford in the time of HENRY VIII., and tutor to the Princess MARY. He was turned out of England for supporting the cause of Queen CATHERINE. Behind is FICINUS, who might be said to have made a god of PLATO in the fifteenth century, and who maintained that the doctrines of the Greek should be taught in all churches. Standing near PICO is MACHIAVELLI, and the cowed figure represents a still greater man, the renowned Dominican CAMPANELLA, who was the precursor of BACON in upholding the necessity of experimental inquiries for all who wish to study nature. Modern socialism, or something resembling it, is to be found in his "City of the Sun." Although he advocated universal monarchy under Rome, the imaginative philosopher was not saved from spending a quarter of a century in prison.

COLUMBUS is the central figure in the corresponding group. In front of him stand LEONARD FUCHS, with a flower in his bonnet, one of those lucky men who, like SHAKESPEARE, have no need of marble monuments, for the fuchsia is his memorial; the bald PARACELSUS, who was a genius, although he could not renounce charlatanism; and the astonished SEBASTIAN FRANK, who preached and printed, wrote histories and geographical treatises. The bent old man, with spectacles on nose, who measures distances on the globe, is SEBASTIAN MUNSTER, the "Father of Knowledge"; and the fine kneeling figure beside him, who might be taken for RALEIGH, on account of his rich cloak and his interest in the use of the globes, is Lord BACON. The young man at the right of COLUMBUS is MARTIN BEHAIM, of Nuremberg, a traveller who obtained a gold chain from the King of Portugal for his discoveries. Behind is the English surgeon, WILLIAM HARVEY, and ANDREW VESALIUS, the Fleming, who was the first of modern anatomists.

It was no easy task to ascertain the qualities of the famous people that were to be introduced in the picture, in order to suggest their characteristics. To investigate how far KAULBACH has succeeded in that part of his work would need a volume, and we have already exceeded our limits. It will be evident to everyone who considers the subject, that paintings which are inspired by an endeavour to represent the greatest actors in the most memorable scenes of the world's history must exert an influence on successive generations which is impossible with works that are designed merely for the gratification of sense. KAULBACH is a teacher as well as an accomplished artist. On account of that duality there is no collection of plates which is better adapted to become a household treasure in all lands than those which Herr DÜNCKER, of Berlin, has brought out from KAULBACH'S series in the new Berlin Museum, and which have the additional value of being masterpieces of the art of engraving.

Mr. Swan, A.R.A., will probably be able to complete his painting *Orpheus and the Beasts* for the forthcoming Academy exhibition.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

It was announced that a meeting would be held that night fortnight to have a debate on the County Council's Buildings Bill.

Messrs. T. P. Stokes and S. Wilkinson were elected members.

Mr. P. E. Masey read the following paper on

Architecture in the East End.

MR. MASEY said:—A short time since I inquired of an architectural friend whether he knew East London. He replied readily in the affirmative, saying he had seen it from the railway carriage when passing through, on his way to Great Yarmouth. And certainly the panorama so obtained is in many ways sad and depressing enough to extinguish any curiosity to make its further acquaintance. Taking an average dull day for the view (for the weather in this part seems somehow generally dull), the spectator may behold a picture in which the prevailing tones are mournful greys and drabs, and the details seemingly composed of endless rows of mean dwellings separated by still meaner courts and back-yards. Here and there Board schools and mission churches in severe stock brick break the monotonous level of pantile roofs. Beyond these a fringe of chemical works, rag yards, rope walks and the like, then an horizon bounded by factories, warehouses and railway sheds, with a few spires and some huge cubes of brickwork, called "model dwellings," interspersed. Above all smoke, smoke everywhere, rising from the countless rows of red chimneys to mingle with the larger streams issuing from the factories, and then melting imperceptibly into the dull, murky atmosphere which overlays this region like a large grey blanket.

There must be many here who know that this description is in no way overdrawn. It is a picture which is eloquent of the sad, dull and unlovely lives passed by many of the inhabitants, and which for unmitigated hideousness cannot, I imagine, be surpassed and, I trust, scarcely equalled. I have ventured to remind you of this, the present aspect of East London, in order to draw attention to the extraordinary change in character and aspect which this district has undergone during the past century and a half. It is most difficult to realise how comparatively modern is the unsavoury reputation which it bears. In endeavouring to put this fact as forcibly as possible before you this evening, I feel that I am only doing my subject bare justice, for this district has played an important part in London history for 800 years, and was the chosen spot for the residence of the wealthier inhabitants for centuries before what is now called the West End had emerged from its primitive state of meadow and marsh.

Before proceeding to describe the few remains of old architecture in East London, I should like to sketch, as briefly as possible, the rise and growth of Stepney, as we are able to gather it from the earliest records up to the present time. The history of Stepney is the history of East London.

Mr. Besant, in his admirable book "London," shows that the deserted Roman city was invaded, refounded and practically re-peopled by the East Saxons. Miletus became its first bishop in 604, and soon after that we have information relating to Stepney from which we may gather that its history is nearly contemporary with that of London itself. It is interesting to note traces of the East Saxon character plainly discernible down to the present day amongst the inhabitants of the East, and Mr. Besant points out that the so-called cockney accent is really nothing more or less than pure Essex dialect. As far back as Saxon times we have records of the Manor of Stebenhythe spelled in half a dozen ways. The manor extended eastwards from the City to the river Lea, and was bounded on the north by what is now Hackney parish, and on the south by the river. When Domesday was taken, Stepney Manor is described as part of the ancient desmesnes of the Bishopric of London, and valued at 48*l.* per annum. The manor house stood a quarter of a mile north-east of what is now Bethnal Green. The Saxon church was called All Saints. Dunstan was made Bishop of London in 957, and probably for a time lived in Stepney. He built the church, and to his memory it was afterwards dedicated.

The derivation of Stebenhythe is supposed to be from Steb, the trunk of a tree, and Hythe, a wharf. The following description by Fitz Stephen in Henry II.'s reign probably includes Stepney:—"On all sides without the houses of the suburbs are the citizens' gardens and orchards, planted with trees, both large, slightly and adjoining together beyond the pastures and plain meadows." Towards the north he described the meadows as "having brooks running through them, turning mills with a pleasant noise," and further, "a great forest, a well-wooded chase having good covert for harts, bucks, does, bears and wild bulls." The Bishops of London seemed to have found Stepney a pleasant place, for they constantly resided there between the eleventh and fifteenth centuries. We read that one of them

tried to make a game preserve here in 1252, but the mayoralty of London, already a rival power, effectually opposed and prevented it, so that the said bishops had to content themselves with tournaments, which were for long after held at Bishops' Hall, the name by which the manor house was known. In 1299 the king held at Stepney a parliament in the mansion of Henry Walters, Mayor of London, on Mile End Green, on which occasion the Charter of Liberties was confirmed. Up to this time there is not very much information to be gathered about Stepney, and it was probably a small and somewhat unimportant place, but from about 1300 its active history may be said to commence. It is interesting to note how early the inhabitants showed their independent nature and demonstrating capabilities from the fact that in both the insurrections of Wat Tyler and Jack Cade they played a conspicuous part. The first step towards the division of Stepney was taken early in the fourteenth century, when the White chapel, called St. Mary Matfelon, was built as a chapel of ease. Soon after (1338) it became a parish to itself. The origin of the name is unknown, though there are several more or less improbable traditions to account for it.

About this time the inhabitants of the eastern portion of the parish, called Stratford Bowe, being frequently unable to attend church owing to the flooding of the fields by the river Lea, a chapel was built and provided with a curate for their accommodation. The name of Bow is stated by Leland to be derived as follows:—"Matilda, wife of Henry I., having herself been well washed in the river, caused two bridges to be built in a place one mile distant from the Old Ford, of which one was situated on the Lea at the head of the town of Stratford, now called Bowe, because the bridge was arched like unto a bowe, a rare piece of work, for before that time the like had never been seen in England." Early in the fifteenth century the bishops ceased to reside in Stepney, but the spot had become a favourite one for the country houses of the richer London merchants.

The reign of Henry VII. saw the rise and development of two great movements, in both of which Stepney played a conspicuous part—the pre-Reformation efforts for religious reform and the development of the navy. Regarding the former several Stepney vicars stand conspicuous. Bishop Fox, a great patron of the new learning; Dr. Heynes, who was sent abroad to confer with Melancthon; Dean Colet, a leader of advanced thought, and founder of St. Paul's School; William Jerome, who paid the price of being before his time by being burned at Smithfield in 1540, and several others.

The spirit of independent thought seems early to have taken firm hold of Stepney, for it afterwards became a stronghold of Puritanism. Respecting the second influence under which Stepney developed, the demand for ships soon caused houses, yards and stores to creep along the river bank, although the country behind between them and the Mile End Road did not alter its rural character for many a century afterwards. The result of this growth of naval enterprise was Ratcliffe, Blackwall and Deptford. At Deptford was built the famous *Great Harry*, which was commanded by Sir Thomas Spert, who also founded the Trinity House, and who was buried in Stepney Church. At Blackwall, some little time after, was built the Brunswick Dock, which was the commencement of the magnificent series which now lines the river bank. In 1550 the manor of Stepney passed away from the Bishops of London after having been held by them nearly 600 years. Nicholas Ridley, Bishop of London, alienated the manor from the see and gave it to Edward VI., who granted it immediately to Thomas, Lord Wentworth.

At this time the manor included several smaller manors, villages and hamlets, which one by one were detached and became separate parishes. The principal of these were Shadwell (Great Chad's Well), Spitalfields, Limehouse (Lymehurst), Stratford, Bowe (Bow), Bethnal Green and Poplar or Popler. In 1625, and again in 1665, Stepney suffered exceptionally from the Plague, although this was probably due to its close connection with the river trade and the foreign shipping rather than from any inherent unhealthiness in the place itself. In spite of these calamities the locality continued a fashionable one. In 1663 the Marquis of Worcester built his mansion on Stepney Green, and we read that in the following year the king instituted a weekly court of record within the manor and granted a weekly market at Ratcliffe Cross, as well as a Michaelmas fair on the Green. Of these privileges one at least survives in the Haymarket still held in Whitechapel. In 1642, when the City was surrounded by a trench, fortifications were made at Mile End, sailors being employed for the work. The fortress, which was intended to defend the approaches to the City from the eastern road, was in the parish of Whitechapel. It was originally made 329 feet in length, 182 feet in breadth and about 25 feet high. The place was levelled to make room for a row of houses at the beginning of this century. The place is called "The Mount," and the rise of the ground may still be noticed. Meantime the riverside hamlets continued to grow in importance. Writing in 1598, Stow com-

plains that "there hath been of late in place of elm trees many small tenements raised towards Ratcliffe, and Ratcliffe itself hath been also increased in building eastward (in place where I have known a large highway with fair elm trees on both the sides), that the same hath now taken hold of Lymehurst, corruptly called Limehouse, sometime distant a mile from Ratcliffe."

Between 1669 and 1743 the districts known as Shadwell, St. George's, Spitalfields, Limehouse, Stratford, Bow and Bethnal Green were detached from Stepney and became separate parishes, owing largely to the increase of population caused by the rapidly-growing trade at the port of London.

During this period, as the following figures will show, Stepney, the mother parish, continued a small place. Between 1680 and 1685 the births averaged 1,380 annually. Between 1790 and 1793 the births averaged 2,260 annually. On the main road, however, between London and Stepney houses were commencing to be built. In 1673 Philadelphia, Lady Wentworth, obtained the king's permission to build upon a piece of land called West Heath, on the road to Stratford Bow. Sir Christopher Wren was employed to survey the ground and give his opinion on the eligibility of the site. We will refer to his report later on when passing the place in question.

Before closing this brief notice of the history of the manor it may be interesting to note its further changes of ownership after having been given, as already mentioned, by Edward VI. to Thomas, Lord Wentworth. From the latter it descended to Thomas, Earl of Cleveland, whose estates were confiscated in 1652. Sir William Ellis, Cromwell's solicitor, was then made steward of the manor, then valued at 200*l.* per annum. After the Restoration the Earl of Cleveland recovered a part of his property, amongst the rest this manor, which remained in his family until 1720. In 1754 it passed to the Colebrooke family, the present lords of the manor. The eighteenth century saw the gradual decline of this venerable suburb from its position as a fashionable locality, although it continued a favourite residence of the middle classes down to fifty years since. The next and last important event in the history of Stepney was the building of the docks to accommodate the enormous expansion of trade with the East and West Indies. Soon after the commencement of these enterprises Stepney, with its mansions and cottages, fields and trees, gardens and pasturelands, disappeared as if by magic, and in its place arose the East London of to-day.

Many were the interesting buildings demolished one by one to make room for the swelling population. In a few cases we have contemporary drawings, more or less authentic, of what then existed, but in many more there is nothing but a meagre record of the fact of their disappearance. In deploring that so little information is handed down to us, it must be remembered that, until comparatively recently, methods of illustration were few and tedious, and the times apathetic in matters artistic. Nowadays, although facilities for obtaining authentic records are great, one has reason to know that much that is historically and architecturally valuable disappears yearly without any such record being made; and although a Government camera could, with small expense and probable profit, perform the needful part in respect to our vanishing old buildings, yet it has been left hitherto to a few disinterested and enthusiastic amateurs to preserve any memorial of them.

In regard to this matter I should like to draw the serious attention of our Camera Club to the fine opportunity here presented to them of doing a really national work. It would be one in which their peculiar knowledge would give them a great advantage, and which, if systematically and thoroughly carried out, would be most valuable, and would earn for them the gratitude of the architectural, archæological and artistic worlds. In the following short and necessarily imperfect description of some of the old buildings remaining in East London, it will be found convenient to take an imaginary journey eastwards from Aldgate as far as Bow, thence to the river, and to return by the river streets to the Tower.

Leaving Aldgate, the gate of the East, behind us, we make our way with difficulty through a busy crowd, which includes Hebrews, butchers, slaughterers, city clerks and Essex farmers, and where railway vans and hay carts, brewers' drays and funeral processions contend with unwieldy trams for the mastery of the road. We should first notice the group of houses on the south side of the street known as "Butchers' Row." Amongst them is a wine and spirit-house of long standing, with a quaint old bar and scoring board. Mansell (or Maunsell) Street leads off to the right. Here several fine old houses of a well-known type still remain. On the north side of Aldgate the last of the historic hosteleries has long since disappeared to make room for improvements. A short distance further east and then the Commercial Road branches off to take the heavy traffic to and from the docks. Here commences Whitechapel High Street. On the left are some houses of Restoration date, which group well with the tower of the new Free Library beyond. Opposite stands the conspicuous spire of St. Mary Matfelon. Of the origin of this strange word there are many explanations, but

none satisfactory. Drawings extant show the old church to have been much of the same type as that of Stepney. There is reason to believe that a chapel existed here long before the fourteenth century when the White-chapel previously referred to was built. Behind the church lies the picturesque and historic bell foundry of Mears & Stainbank, where many famous bells have first seen the light.

A little further on we pass "The Mount," a row of houses on slightly raised ground, which occupies the site of the fort raised in 1642. Beyond is the London Hospital, built by Mainwaring in 1752, and furnished with nearly 800 beds. The exterior is simple and dignified in treatment, and seems to be more suited to its purpose than many more ambitious buildings whose pointed turrets and florid detail sometimes suggest a music-hall rather than a House of Mercy. Within, the upper floors are served by two substantial oak staircases, which also contrast favourably with more modern developments. One of these takes the traffic of half the hospital, and is known not to have been repaired for upwards of fifty years, whilst a stone external staircase close by, built in 1876, and taking only a fourth of the traffic, has had to be repaired twice since its erection. Nearly opposite the hospital starts the old road leading to Bethnal Green. There is little there now to reward a visit, although the neighbourhood was in old days a rival to Stepney in popularity and possessed fine houses in abundance. The name is supposed to be derived from the Bathon family, who held property here in the reign of Edward I.; the memorials of the parish are most interesting, and to do justice to them would need much more space than we have now at our disposal.

The most interesting building in Bethnal Green parish was the residence of the Bishops of London, the ancient Stepney manor house, and known as Bishop's Hall. It was situated about a quarter of a mile to the N.E. of the Green, and remained until 1844, when it was swept away in the making of the Victoria Park. The parish was separated from Stepney in 1743, and the church built in 1746. Amongst other noted buildings were "Kirby Castle," a large house facing the Green, built by John Kirby in the sixteenth century, and a chapel standing at the N.E. end dedicated to St. George.

Both these buildings disappeared about ninety years since. Beyond is Hackney, rich in history and associations; but, as Hackney does not consider herself in East London, we will retrace our steps to Mile End Gate and resume our journey east. Just beyond the curious old inn, standing isolated on the "waste," we reach one of the gems of East London architecture still remaining, the Trinity Almshouses.

These almshouses were founded in 1695 by the Corporation of Trinity House for twenty-four old commanders or mates of ships, their wives or widows. Architecturally these buildings are in their way admirable; the general treatment quiet and unobtrusive, as befitting their use, and the detail excellent and appropriate. The dwellings occupy two sides of a quadrangle, the chapel the third side, and a boundary wall and railing, with handsome gate-posts on the street side, separate the inhabitants from the roar of the Mile End Road. The ends of the dwellings abutting the street are gabled and ornamented with models of ships of the period. The doorways are grouped in couples, each with its flat carved porch; each pair of dwellings share an ornamented lead and cistern placed between them. The centre of each block is treated with a pediment, with carved tympanum. The dwellings were originally returned along the north side to meet the chapel in the centre, but they were demolished to make room for the extension of the buildings at the back. In the centre of the quadrangle is a statue of Captain Sandes, a former benefactor. The glass in the chapel is interesting, it having been taken from the old hall of Trinity House, at Deptford, when it was pulled down in 1786. Adjoining the Trinity on the west side are the Skinners' Almshouses, built in 1698. They are very similar in character to their neighbours. It is much to be regretted that the site has been sold, and that these quaint and interesting buildings will shortly be demolished, to make room for a new Jewish synagogue. Further east on the same side are the Vintners' Almshouses, of later date, and of no architectural interest. It seems a pity that a form of benevolence so satisfactory to all parties concerned should have been elbowed out of fashion by the wholesale system of charity, if I may so call it, nowadays in favour. In Lyson's "Environs" a plan is given of this part of the parish, drawn by Sir Christopher Wren in 1673, who was asked to report upon the suitability of the site for building, by request of Philadelphia, Lady Wentworth, who had obtained the king's permission to build there.

We have now reached the north end of Stepney, or Mile End Green. The Green is now enclosed and planted with flowers, and looks well cared for. There are several comfortable-looking old houses left to remind us of the bygone prosperity, but of the great mansions none remain. The last one—that built by Sir Henry Colet (father of Dean Colet), called Great Place—was cleared away some years since. Hard by was the famous Worcester House, built by the Marquis in 1663, of which the gateway remained in 1810. It stood opposite the

ancient rectory, or church door, near the east end of the church. A little further on, at the corner of Whitehorse Street, was the house given by Dean Colet, when founding St. Paul's School, as a country house for the head masters, and which continued to be used as such until the present century. Nothing now remains of it, but the great name is kept in memory by "Colet Place."

We have now arrived at Stepney Church. In spite of two centuries of tinkering, and its present grimy surroundings, the exterior retains a certain amount of dignity and architectural character. The plan of the present church consists of a chancel, nave and two aisles. It is apparently of late fourteenth-century date, and needs no special comment. On entering the south porch we are reminded of the existence of one of the previous churches by a carved panel representing the Crucifixion, of the twelfth century; there is also the mutilated remains of a holy-water stoup. The first thing to strike one on entering is the hideous gallery over each of the aisles. They are placed so as not to interfere with the nave arcade, and are indications of more prosperous times. The first was erected in 1601, and the other added in 1684 to accommodate the large increase of congregation caused by the Great Fire. In the north porch is another relic of the previous church, *i.e.* a carved panel, too decayed for the subject to be identified. Near the west door the modern Norman font rests on a black marble plinth. This was the tombstone of the infant Lord Darnley, elder brother to James I.'s father. The child was buried beneath the altar whence this stone was removed some years ago, to be put to this not altogether inappropriate use.

The church contains many handsome tombs, chiefly Elizabethan and later. The most noted one is in the north side of the chancel, the altar tomb of Sir Henry Colet, citizen and mercer of London. He was Mayor between 1486-95, and in memory of his more distinguished son, the founder of St. Paul's School, the tomb is faithfully kept in repair by the Mercers' Company. On the south side are thirteenth-century sedilia from the earlier church. Near the Colet tomb is one to Alderman Clark, dated 1510. There are many other interesting graves and monuments in the church, notably to Anne, Lady Wentworth, 1571; John Kyte, Bishop of Carlisle; Richard Pace, Dean of St. Paul's; Nicholas Gibbon, Sheriff of London; Sir Thomas Spert, founder of Trinity House, and many others. The remains of the ancient rood-screen existed till 1621. In 1622 a three-decker was erected, and the King's Arms and the Creed, the Lord's Prayer and the Ten Commandments were put up, says the record, "after a handsome and beautiful manner." During the Plague the churchyard was put to great strain, and a plague-pit had to be made on the north side of Mile End Road. This is shown on Sir Christopher Wren's plan. The Plague records here are very perfect and interesting, and the vestry minutes have been kept with greatest care from 1579. They have lately been carefully edited and printed under the title of "Memorials of Stepney Parish," by the Rev. G. W. Hill and Mr. W. H. Frere, and from which I have gained much interesting information. Before leaving the church we should notice a stone built into the wall near the west door, having the following curious inscription:—

Of Carthage wall I was a stone,
O Mortals read with pity,
Time consumes all—it spareth none,
Man, mountains, time or city.
Therefore, O Mortals, now bethink
You whereunto you must,
Since now such stately buildings
Lie buried in the dust.

THOS. HUGHES, 1663.

After glancing at the interesting collection of maps, prints and relics of Old Stepney Church, preserved in the vestry, we must retrace our steps to the Mile End Road in order to see Bow Church, which lies in the main road a mile and a half eastward. We pass another group of old houses on the north side of the road, and then the People's Palace, noting that it displaced the Bancroft Hospital, founded in 1727 for the maintenance of twenty-four poor men and the education of 100 boys. A short tram ride brings us to Bow Church or Stratford-Bow Church, standing right in the centre of the road. Stratford Bow Church, as already mentioned, was built as a chapel-of-ease to Stepney, but after long rivalries and quarrels it was made a separate parish in 1719. The bells of the church were the famous ones mentioned in the nursery rhyme. The church is dedicated to St. Mary, and was built early in the fourteenth century; it consists of a chancel, nave and two aisles. There are one or two interesting monuments in the church and some old Flemish glass. There is nothing of special interest in the architecture. Opposite the church are some old houses, one of which still serves useful purpose as a club for young women. We must now retrace our steps for some distance westward until arriving at the Burdett Road, which takes us south to the next point of interest, Limehouse. The parish church is dedicated to St. Anne, and is one of the fifty brought

into existence by the Act of 1710. The architect was Nicholas Hawksmoor, the building being completed in 1724. The tower is a well-known landmark, and can be seen for many miles by those approaching London by the river. The interior of the church does not call for special mention; the whole building is treated in a plain, sensible style, but, excepting the tower, is not remarkable for grace or proportion.

This church is raised on a somewhat remarkable crypt, which is almost important enough in its nature to form a lower church. It contains vaults long sealed up, and it may be supposed that they were thus kept above ground to avoid difficulties with the adjacent river. Behind the church lies the old riverside highway called Three Colt Street, in which are some characteristic timber-fronted houses.

Below Limehouse lies the Isle of Dogs, or Stepney Marsh. It is supposed to have gained its former title from the dogs belonging to the Court of Greenwich being kept there. On the island there formerly stood an ancient chapel, dedicated to St. Mary, and supposed to be built for the convenience of mariners. It had been turned into a farm in 1800. It disappeared when the East and West India Docks were built. There is little to detain us in the adjoining parish of Poplar. The church was built as a chapel-of-ease in 1650 and rebuilt when the docks were made. An ancient hall standing in the High Street was pulled down in 1760.

Amongst several noted residents of the parish was Sir Richard Steel, who resided here some years. We now turn westward, and, skirting Limehouse Church and Basin, we take a turning to the left which brings us into the ancient riverside street of which the famous Ratcliffe Highway is a continuation. Here still remain some wooden houses of the well-known waterside type, as well as several good doorways and shop-fronts.

In a few minutes we have walked into Shadwell, whose name is a corruption of St. Chad's Well, formerly in the churchyard. The parish separated from Stepney in 1669. The previous church was burnt in 1821, when the present feeble edifice took its place. In 1749 the mineral springs were rediscovered, and an attempt made to establish a spa, which, however, soon died a natural death. The church is very appropriately, like many others hereabouts, dedicated to St. Paul. After passing Shadwell the street begins to widen, and we are soon aware that we are in St. George's Street, otherwise the "Highway." The district was known as Wapping Stepney, until St. George's parish was created in 1715. The church itself almost overshadows the Highway. It stands well in a good piece of ground, formerly a churchyard, but now converted into a recreation-ground. The tower is known to most of us, even to our Great Yarmouth friend, and so does not need much description. Those who have seen it have seen, perhaps, the best part of the church. Here, in the earliest days of religious revival, the infamous surplice riots took place. Within, the church is in its details expressive of the solemn respectability of fifty years since. The exalted place for the churchwardens, the crimson velvet cushions, comfortable pews, queer high pulpit with sounding-board, and, until lately, the charming old ladies with white caps who showed visitors to their seats, make a *tout ensemble* which in these advanced days seems quite archaic. A large proportion of the parish was pulled down in 1810, when the London Docks were made, and, as in parishes of similar nature, the better class folk have fled beyond the smoke to the suburbs.

Before leaving, notice the mosaics by Salviati, and the excellent decoration lately done under the superintendence of Mr. Keith Young. On the other side of the highway Old Gravel Lane runs down to the river. Near the lower end behind St. Peter's, London Docks, are the original buildings of the Raine's Schools. Henry Raine, a local brewer, here founded in 1719 a school for fifty boys and fifty girls. He also endowed a further scheme for educating a certain number of girls for domestic service. The scheme included the giving twice annually a wedding dowry of 100*l.*, drawn for by the girls. This interesting charity is still administered according to the original intention, but I regret to say that a new scheme is in process of being established, and in a few years the last dowry will have been paid. Hard by are Wapping Old Stairs, of classic memory, and also Execution Dock, of unenviable reputation. Here, according to Stowe, were hung in chains all pirates brought to London, and were not removed until three tides had flowed over them.

After glancing at Wapping Church, with its picturesque-looking tower, and noting several good doorways and shop-fronts, we return to the highway and turn westwards again. Princes Square is close by on the north side. In the centre is a curious little box of a place, the Swedish Church, built in 1729. Here was buried Swedenborg in 1772. A little further on is Wellclose Square, containing the Danish Church built by C. J. Cibber in 1696, at the expense of Christian II. of Denmark. It is now the British and Foreign Sailors' Mission Church, and contains an organ which is famous. Hard by are the St. Katherine's Docks, which preserve in their name the

memory of the splendid and famous buildings destroyed in their making in 1827. The charity was founded in 1148 by Matilda, wife of Stephen, as a hospital for the maintenance of a master and several poor brothers and sisters. It was dissolved and refounded on a similar but improved basis by Eleanor, widow of Henry III. During the Middle Ages the foundations were several times enriched by royal gifts. In the thieving days of the Reformation it managed, partly through royal protection and partly through the spirited opposition shown by the surrounding parishioners, to escape spoliation and dissolution. In the seventeenth century, however, many of the old buildings were destroyed by fire, and in 1825 the church was pulled down to make room for the docks.

At Regent's Park, whence the hospital was removed, there is a picture preserved, taken shortly before the church was demolished. Here are also carefully preserved many interesting relics. The old church seems to have consisted of nave, choir and aisles. In the chapel at Regent's Park may be seen the fine monument of John Holland, Duke of Exeter, his duchess and also his sister. He fought in the wars of Henry VI. and died in 1447. The detail is excellent and in fine preservation. The east window until lately was filled with old glass brought from the destroyed church, but the subjects were not considered appropriate for their position, and in 1887 the window was removed to make way for a modern one in commemoration of Her Majesty's Jubilee. At the west end of the chapel are some of the fourteenth-century stalls and a curious font. The pulpit is said to have been given to the hospital in the reign of James I. The organ also removed from the old church is noted for its fine quality and the possession of a remarkable swell. In the chapter-room are preserved some miserere seats, fine carvings from old choir-stalls, some charming old chairs, and a most interesting chandelier of fifteenth-century date.

From St. Katherine's Docks we reach the Minories, an historic street having its north end in Aldgate, where our journey ends. One cannot pass through this street without saying something about the abbey of St. Clare, although of this important Mediæval establishment only a small piece of wall remains. The nunnery of St. Clare was founded by Edmund, Earl of Lancaster, in 1293, to accommodate some nuns introduced from France by his wife Blanche, Queen of Navarre. The abbey became one of great importance during the Middle Ages, and continued until the Reformation, when it was dissolved. The abbey buildings then became the residence of many distinguished people. In 1552 Edward gave it to Henry, Duke of Suffolk, father of Lady Jane Grey, who was afterwards beheaded on Tower Hill. Holy Trinity Church, Minories, keeps in memory two great houses, for its name is derived from the famous monastery near here, whilst the wall forming the north side is the only fragment left of the nunnery of St. Clare. The church is much visited on account of its interesting associations. It was one of those which escaped the Great Fire, but it was partly rebuilt in 1706. The monuments and several of the fittings are preserved from the earlier church. Here is the tomb of Legge, the favourite servant of Charles I., and of his son, the first Earl of Dartmouth. One of the monuments is specially interesting as exhibiting the arms of the Washington family.

There is a pretty little Elizabethan monument under the west gallery, with a bread-shelf beneath whence loaves are distributed to the poor on St. Thomas's Day. The church itself is a queer little place, lighted with a dome in the centre. A gallery runs along the south side only, and there is a miniature choir and communion table. In the vestry there are several valuable prints of the last century showing the ruins of the demolished monastery buildings. The Plague records are also shown in beautiful handwriting. Here, too, is preserved in a glass box that ghastly relic, the head of the executed Duke of Suffolk, whose connection with this spot has already been mentioned. When sealing up the vaults many years since, this head was discovered caked in oak sawdust which had, by tanning the tissue, preserved it in the wonderful perfect state in which it was found.

Mr. ASHBEE, as a resident, alluded to the house he himself lived in, also to the palace at Bromley-by-Bow, one of the few remaining Elizabethan houses in London, now being destroyed under the superintendence of the Architect's Department of the London School Board, who had bought and jobbed away the fittings to a contractor, who sold all to a dealer for 150*l.*, the dealer immediately offering a single mantelpiece for 100*l.* Mr. Ashbee had succeeded, however, in preserving for South Kensington some of the finest of the ceilings.

Rev. J. K. MAHOMET, chaplain of London Hospital, said there was much good old work remaining if you could get hold of some fathers of the district to give information.

Mr. FELLOWES PRYNNE proposed a vote of thanks to Mr. Masey, which was seconded by Mr. W. E. Sedgwick and supported by Mr. Satchell.

The PRESIDENT referred to whole streets of Georgian buildings in Bermondsey and Southwark; also to the discovery of silver coins of King Edward in ballast dredged from the

Thames. He also said it seemed curious that so well-educated a body as the London School Board should not have known better than destroy the interesting fittings of Bromley Palace.

The vote was passed by acclamation, and the proceedings terminated.

ROBERT FOWLER, R.I.

IN South Castle Street, just at the zone of differentiation between the mercantile region dominated by "the Flags" and that which owns the sway of the docks, says the *Liverpool Daily Post*, is to be found one of the most interesting art studios in Liverpool, that of Mr. Robert Fowler. One enters beside a shop where flags of another sort exhibit a startling combination of colour, Japanese in its boldness, but innocent of the subtle harmonies of the East. The visitor who survives this strange blast of discordant colour is shortly refreshed by the delightful concords of a studio which has the stamp of the sensitive artist in every detail of its decoration. In it there has laboured, well-nigh lived, for a good many years an artist who amply merits that term in its wider sense, for Mr. Fowler's work as a painter is the expression of a mental activity which takes all art for its province. His easel is the centre of a little system of satellites of congenial tastes, to whom he is a powerfully inspiring force in their pursuit of painting, music and poetry. From time to time most of the younger art thinkers of Liverpool have yielded to the attraction, and few have left it to pursue the comet-like solitary course of the artistic life without carrying away illumination and mental force. The benefits have doubtless been reciprocal, and while he has been helping others to develop, Mr. Fowler has been broadening and deepening his own power as a painter. The working out of his destiny has been by no means simple, for his exceptional fertility of invention and his versatility of style have made the problem of what to do and how to do it an extremely difficult one. In subject and treatment there is scarcely anything that has not been tried, and at times Mr. Fowler's admirers have been inclined to shake their heads and dismiss him as a hopeless "Jack of all trades." The danger of such incorrigible versatility is great, and few there be who surmount the obstacles it creates; those who do, arrive at last at recognition as men of a higher order of thought than those who attain earlier to the simpler excellence of doing one or two things very well.

Mr. Fowler's imagination, after beating the air in all directions for his ideal with a passionate desperation equal to that of D'Albert, has found it at last in the art of Japan. This, which he probably caught from Mr. Woodlock, has been more and more apparent in his recent work, and the art of the pictures now on view in his studio holds in perfect solution some of the best elements of Japanese pictorial art. None the less is it a firmly articulated personal style; there is as a rule no blatant imitation of Eastern strangenesses—no crimson sky, distorted perspective or impossible proportion. The problems set to the curious by other Japanese devotees are not to be found on Mr. Fowler's canvases, in which no doubt is left as to which are the calves and which the children. The exquisite arabesque treatment of form and colour so as to make them intrinsically beautiful is the secret of the Japanese which he has pursued and overtaken; happily he has been content with the spirit, the essence, and has avoided mere imitation of manifestations which, natural in their native place, are in an English studio mere affectations. He has worked out for himself the axiom that "Nature is a purely anthropomorphic conception to be used by the artist with entire freedom," and in this connection styles himself an "optionalist."

In a period which prates idly of ridding art of "literary quality" Mr. Fowler remains a staunch adherent of the condemned school, but in such wise that its orthodox members would scarcely recognise his adhesion. He brings to his work a fancy stuffed with what is best in poetry, romance, legend, history, philosophy and music, and his pictures are filled with symbolical meaning and poetic suggestion. He is not neglectful of "the imaginative treatment of pigment," but uses it only as a means to the higher business of the imaginative treatment of imaginative conceptions. It would be difficult to trace and define the relationships of Mr. Fowler's art to that of other Europeans; he is as persistently symbolical as Mr. Burne-Jones, as persistently pagan as Albert Moore, but the resemblances to either are otherwise very remote, and they have grown fainter as his treatment has become increasingly vaporous, delusive and individual. His *Enchanted Glade* in the Grafton Gallery is a signal example of this latest manner, and the tender subtlety of *After Music*, now in the studio, still further illustrates it. The mysterious quality of the technique, the colour and tone arrived at one cannot exactly tell how, are perfectly in correspondence with the theme. *Eve and the Voices*, a picture which cannot fail to challenge attention to its beauty of design, peculiarly sweet colour and daring (if somewhat Walt Whitmanish) symbolism, is similarly elusive in technique; and so is a lovely landscape in which is realised that rarest of

successful achievements on canvas, a perfect sense of moonlight. It is almost startling to turn from this to another landscape in which cliff and sea in strong sunshine are presented with bold, almost insolent, breadth of brush-work. The never-failing sensibility to noble colour is the only characteristic the two have in common. The exasperating unlikeness of Mr. Fowler to himself in varying moods of inspiration makes him extremely difficult to classify, but it is due not to uncertainty of execution—for he does not seem able to lay on paint wrongly or in the wrong place—but rather to the altogether exceptional range of effort which proceeds from the restless activity of a nervous organisation controlled by a mind stored with an infinitely varied stock of well-digested knowledge. It doubtless retards fuller recognition, especially among brother artists, who are by training unfitted for large catholicity of judgment. Among very young students candid admiration and appreciation may be found, but the full-grown artist has formed his ideals and prejudices, outside of which he seldom recognises excellence. Virtuosity in the handling of paint is sure to appeal to him—a brilliant executant like Mr. Sargeant he can understand even if his own handling of pigment be deplorably niggling and laboured; but the soul of another man, unless it be after his own fashion, is incomprehensible. Imagination, second invention—these are to be suspected as heresies by all who lack them—and their name is legion.

Mr. Fowler has probably worked out his own individuality more completely by remaining in Liverpool, but it has also retarded his recognition, for provincial opinion looks to the Metropolis for guidance, and the Metropolis is slow to discover genius not affiliated to any of its log-rolling associations. Like the silversmiths' spoons, genius must be hall-marked in London before we dare accept it as unquestionably made of precious metal. Mr. Fowler, however, is not a member of the Royal Institute of Painters in Water-Colours; he has somehow made metropolitan criticism begin to be conscious of his doings, and his pictures are no longer strange apparitions at London exhibitions. At a coming exhibition in the Guildhall he is to be one of a hundred representative artists from the time of Reynolds until now. There is every reason to predict a considerable growth of his fame in the near future, and few painters of the day are so fully equipped in intelligence, enthusiasm and technical facility for the toilsome climb towards Fame's highest pinnacles.

THE OVERTURNING OF COLUMNS.

THE following interesting paper from the *Seismological Journal of Japan*, by Mr. F. Omori, of Rigakushi, reveals the power attained by the Japanese in dealing with constructional problems.—The engineering authorities of Japan have been long engaged in an endeavour to ascertain the best form of a wall or pier which, rather than snapping at its base, would, when subjected to horizontal reciprocating motion, be as likely to snap at any one horizontal section as at any other.

A brick building with walls approximating to this form has been designed and built by Professor K. Tatsuno on the University compound. Mr. C. A. W. Pownall, M.I.C.E., has constructed brick piers for the bridges on the Usui Pass, some of which are 110 feet high with similar sections. The piers follow a parabolic contour from the foundations to the springing of the arches. An experiment relating to overturning which is in progress is to determine the relationship between the dimensions of a body and the amplitude of motion which will fail to overturn the same, no matter how short the period of motion may be. Mr. Omori's essay is a contribution to the subject. He has also accomplished another serviceable piece of work. Many earthquakes seem to be the result of sudden fractures or yieldings taking place during the process of rock-crumpling: it does not seem unlikely that the relief of strain along one axis should be altogether without effect upon neighbouring axes where folding may also be in operation. Mr. F. Omori has plotted the shocks which succeeded the great disturbance of 1891 as a curve, the co-ordinates of which are equal intervals of time and the number of shocks occurring during these intervals. The immediate cause of the disturbance was the formation of a large fault which can be traced some forty or fifty miles, together with several minor faults. During the seven months which followed the great shock no less than 3,000 shocks were recorded. How many have been recorded up to date has not been calculated.

The curve representing this decrease in activity closely approximates to a rectangular hyperbola, which now, with an average of two shocks per day, is becoming asymptotic.

With the law of decrease deduced from these records, Mr. Omori calculates that it will take about thirty years for the district to regain its original stability.

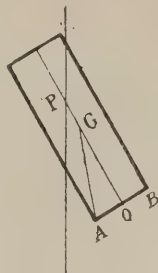
The acceleration formula of Professor C. D. West $f = \frac{x}{y} g$, where y is the height of the centre of gravity of the column and x half the basal dimension, seems, as tested in experiments

with columns of moderate dimensions, such as tomb-stones, to give practically satisfactory results. Its applicability, however, ceases when the amplitude of motion becomes very small. A motion whose range is very small, even though the maximum acceleration be very great, would never be able to overturn large columns. For instance, if $\text{ampl.} = 1 \text{ mm.}$, $\text{period} = 0.1 \text{ sec.}$, then the maximum acceleration is 3,950 mm. per sec. per sec. But this motion, as may be easily tested, cannot overturn a column whose dimensions are, say 2 inches in base and 8 inches in height. That amplitude plays a very important part in the overturning of columns may be seen from the following considerations.

We shall distinguish two cases of motion, in one of which the period is very short, and in the other where it is comparatively long.

First Case.—When the period is very short, the column would be overturned towards the direction from which the impulse comes. Since the period is very short, the column will behave as if a sudden blow or displacement were applied to its base, *i.e.* will tend to rotate about its centre of percussion with respect to the edge about which the column will actually turn. The height of the centre of percussion P , for a column of rectangular section whose height is $2y$, and whose breadth is $2x$, is

$$\frac{4}{3} \frac{(x^2 + y^2)}{y}, \text{ or } \frac{4}{3} \frac{(x^2 + y^2)}{3y}.$$



The column will be overturned when the rotation of it is so great as to bring the centre of gravity G vertically over the edge A —that is, when

$$\frac{2a}{OP} = \frac{OA}{OG} \text{ approximately,}$$

$2a$ being the range of motion or displacement communicated to the edge A ; or

$$(1) \dots \dots 2a = \frac{OA}{OG} \cdot OP = \frac{x}{y} \cdot \frac{4}{3} \frac{(x^2 + y^2)}{3y} = \frac{4x}{3y} \frac{(x^2 + y^2)}{3y}.$$

This equation will give the lowest limit of the range of motion, when the period is very short, necessary for overturning a rectangular column of height $2y$ and of breadth $2x$. We here give a few applications:—

	$2x$	$2y$	$2a$
(1).....	(a) 1 in.	4 in.	0.71 in.
	(b) 2	8	1.4
	(c) 3	12	2.1
(2).....	(d) 6	24	4.3
	(e) 12	48	8.5
	&c.	&c.	&c.

From equation (1), the range of motion $2a$, is seen, for columns whose height and breadth have a constant ratio, to be proportional to these dimensions. Columns with the same ratio of height and basal dimensions as in the above group (2), and of the absolute dimensions between (d) and (e), would represent the case at Nagoya on the occasion of the great earthquake. The range of motion at that city might have been not very much different from 8 inches.

As equation (1) shows, the range of motion necessary for overturning a column increases in proportion to its dimensions. This seems, judging from experiments tried with small columns, to be extremely probable. If the basal dimension of a column be 20 feet and its height 100 feet, equation (1) will give $2a = 14$ feet. This may, in a measure, explain why the five-storeyed pagodas have not yet been overthrown even in such severe shocks as the Yedo earthquake of Ansei second year (1854) or the recent Gifu-Nagoya earthquake. Again, we know that the upper broken portions of brick chimneys are often rotated, but not thrown down. Such may partly be due to the range of motion not being sufficiently great.

Second Case.—Let the period of motion be comparatively long, say one or two seconds. Then, supposing the motion to be simple harmonic, the column, when of proper dimensions, would not be overthrown at the start (as in the preceding case), but will move together with the ground and acquire its velocity. When the ground particles reach one extremity of motion, and its velocity becomes zero, the column would still retain its acquired velocity and be overturned in the forward direction as the ground begins to move backwards. This is precisely what takes place in actual trials. Under this supposition, the behaviour of the column at the instant of overturning will be the same as when a certain velocity is suddenly communicated to the body.

If $2y$, $2x$ be respectively the height and breadth of a column, then the velocity, which, when suddenly communicated

to the column, is just able to overturn it, that is to rotate the column so far as to bring the centre of gravity just vertically over the edge about which it turns, is

$$(3) \dots V = \sqrt{\frac{8g \sqrt{x^2 + y^2} (1 - \cos \phi)}{3 \cos^2 \phi}}; \text{ or } \sqrt{\frac{8g y (1 - \cos \phi)}{3 \cos^3 \phi}}$$

ϕ being the angle between the diagonal and a vertical side of the column. The following are a few illustrations.

$2x$	$2y$	V	$2a$
1 in.	4 in.	8.2 in. per sec.	2.6 in.
2	8	11.6 per sec.	3.7
3	12	14.2 per sec.	4.5
6	14	20.1 per sec.	6.4
12	48	28.4 per sec.	9.0
&c.	&c.		

The values of V for columns having the same ϕ varying as the square root of y or x .

Now V may be looked upon as being equivalent to the maximum velocity of the particle in its simple harmonic motion, namely—

$$V = \frac{2\pi a}{T}$$

Hence, if we know the period of motion, we can approximately determine the range of motion. The figures in the last column of the above table have been calculated from this formula, $2a$ varying as V . The period of motion at Nagoya was probably not far different from one second. The estimated range of motion for Nagoya is thus seen to be nearly the same, whether we suppose the motion to be very short in period or, what is more likely, to be comparatively long.

In my own belief, the "accelerations" of the motion of ground as determined from the observations of overturned columns seem to be practically correct, and the results of the calculations here indicated are only to be looked upon as checks.

WILLERSLEY CASTLE.

ONE of Carlyle's pets was Richard Arkwright, who is described as "no romance hero with haughty eyes, Apollo lip and gesture like the herald Mercury; a plain, almost gross, bag-cheeked, pot-bellied Lancashire man, with an air of painful reflection, yet also of copious free digestion—a man stationed by the community to shave certain dusty beards in the northern parts of England at a halfpenny each. Oh, reader, what a historical phenomenon is that bag-cheeked, pot-bellied, much enduring, much inventing barber! French Revolutions were a-brewing; to resist the same in any measure, imperial Kaisers were impotent without the cotton and cloth of England; and it was this man that had to give England the power of cotton."

About 1771 Arkwright set up his first cotton mill in Matlock Dale; and there he laid the foundations of his immense fortune. In 1782 he was able to purchase the Manor of Willersley, or Willersley, which was one of the largest estates in England. He erected a mansion from the designs of William Thomas. During the progress of the works a set of verses appeared, addressed to the architect. It is rarely a compliment of that sort is offered, and accordingly the lines merit to be recorded for their subject if not for their style:—

These new form'd towers in prospect as I view,
With mind intent, their progress I pursue,
Which well our fixed attention may command,
Displaying on each stage a master's hand,
Disposed to captivate the gazer's sight
As ancient grace with modern strength unite,
Where uniformity its charms displays
To bend each arch, each swelling column raise,
While relative proportion rules the whole,
Of every part the animating soul:
As the vast pile still growing on our eyes,
Shall still, with happy auspices arise,
Such, Architecture, are thy traits confessed,
From times remote, in various modes expressed,
That art renown'd which elder ages taught,
And Rome succeeding, to perfection brought,
Ere Europe's modern sons put in their claim,
In later ages emulous of fame.
Hail, Art sublime! preserv'd with constant care,
Offspring of Symmetry and Order fair,
O may we see thy votaries increase,
And mark thy beauties in the days of Peace.
And thou whose useful talents here are shown,
Thy skill by many a pleasing structure known,
Well do thy precepts and designs impart,
The elements of thy beloved art;

Nor thus content, yet emulous, we find
Thy fair example leave those rules behind.
Thomas, proceed, thy powers at full display
Where genius kindly points the destined way;
Boldly advance; the path before thee lies,
By genuine merit to fair fame to rise;
While still thy fix'd attention to engage,
For thee fair Science ope's her ample page.
Form'd, as thou wast, beneath the fostering care
Of those whose fame their various works declare,
What mayst thou not attempt, as mellowing time
Shall raise thy genius and thy powers sublime,
Call forth thy vigour, bid thy views extend,
The fair and useful in each work to blend.
Meanwhile this varied scene enchants our eyes,
Where Art and Nature's choicest beauties rise.
By taste united, which can best combine
The fair ideas of each just design,
Such as with proper elegance displays
The edifice that speaks the artist's praise.

GENERAL.

The Clayton Loan Collection at Bank Field Museum has been valued for the executors, and will be offered to the library committee of the Halifax Town Council for purchase.

The Parish Church of Grinton is to be restored, the estimated cost being 2,000*l*.

A Memorial Tablet, designed by Messrs. M'Gibbon & Ross, has been set up in the new chapel of St. Giles's Cathedral, Edinburgh. It bears the following inscription:—"This chapel was erected to the memory of William Chambers, of Glenormiston, LL.D., publisher, Lord Provost of Edinburgh, 1865-69, to whose munificence Scotland is indebted for the complete restoration of the ancient cathedral, 1883."

Sir George Reid has been re-elected president of the Scottish Artists' Benevolent Association. The capital funds now amount to 3,396*l*.

A Technical School is to be erected in Richmond Terrace, Brighton, which will contain laboratories, lecture-theatres, research-rooms, lavatory and various classrooms. The estimated cost is only 13,000*l*.

Mr. A. C. Morton is endeavouring to persuade the Government to expend 100,000*l* in putting Holyrood and Linlithgow Palaces into a proper state of repair. He proposes that 10,000*l* a year should be employed for ten years.

An Amended Design for the Bath Pump Room annexe is to be prepared by Mr. Brydon, in order to obtain a less costly building.

The Glasgow School Board have acquired 6,000 yards of land in Dennistoun as sites for two schools.

The Court of Chancery has granted the sale of a site for the proposed Mathew Park church. The vicar of West Ham (the Rev. Arnold Pelly) undertakes the whole responsibility of erecting the building.

Naval Barracks for 3,500 officers and men are to be erected at Chatham. When this building is completed the hulks which now occupy valuable space in the basins will be removed. The barracks at Walmer are also to be extended.

The Case of Drew, Bear & Co. v. Edwardes, which relates to a contract for the ironwork at Daly's Theatre, has been sent by the Queen's Bench Division before one of the official referees.

The Master Builders' Association will meet in July at Bolton.

The Annual Report of the Surrey Archaeological Society states that the number of members was 315, viz. 218 annual, 95 life and 2 honorary. During the year thirteen new members (twelve annual and one life) had been elected, and by death they had lost nine members. There was a small deficit on the year's expenditure, and this was accounted for by the funding of several life subscriptions formerly treated as current account. The reserve fund consisted of 389*l*. 16*s*. 3*d*. in 2*1*/₄ per cent. Consols, and a sum of 25*l*. on deposit, pending investment.

The Workmen employed on the interior renovation of Poughill Church, Bude, have discovered some excellent traces of fresco-paintings worked upon a coat of plaster on the walls of the north and south aisles. The fresco in the north aisle measures about 12 feet by 9, and is undoubtedly a work of a very early part of the sixteenth century. It is a representation of St. Olaf, who is the patron saint of the church. The fresco in the south aisle measures 11 feet by 8, and has St. Christopher for a subject.

Inber Court, Thames Ditton, which will shortly be offered for sale, was originally designed by Inigo Jones. The wings were added at the close of the last century.

The Admiralty Buildings are expected to be ready for occupation in the course of the present year.

The Architect.

THE WEEK.

It is not often so slight a cause as occurred at the Birmingham Assizes on Tuesday is considered sufficient to postpone the hearing of a case indefinitely. The plaintiff sought to restrain the Aston Local Board from pulling down a house which was built, it was alleged, without conforming to the by-laws. The dispute really turned on the signification to be given to the phrase "south side." The plaintiff was authorised "to erect dwelling-houses on arches or girders with pillars over the main sewer on the south side of Holte Road, Aston." The question to be decided was whether the phrase meant the south side of a particular sewer or was intended to distinguish between a sewer on the south side of the road and one in the centre. The latter suggestion was the plaintiff's, but as it was not recorded on the pleadings it was necessary to have the trial adjourned to London in order that the documents might be amended. The costs for the day fell on the plaintiff.

A CASE for the recovery of architects' fees, amounting to 492*l.* 19*s.*, was heard before Mr. Baron POLLOCK in Birmingham on Tuesday, and was decided against the plaintiffs. In fact, the defendant's case was not presented. It appears that on October 13 Mr. CHARLES MAJILTON, a theatrical manager, with the late Mr. APPLEBY, called on Mr. RADCLIFFE, of the firm of RADCLIFFE & WATSON, and said he wished to have plans prepared for a theatre at Aston, which was to have a pit capable of containing a thousand people, besides three or four shops in front. The sum mentioned as the proposed outlay was 5,000*l.* or 6,000*l.* A few days afterwards Mr. APPLEBY, to whom the arrangements were confided, called, and was shown a plan with pit accommodation for 600, but he would not approve of it; nothing less than a pit for 1,000 would answer. Mr. RADCLIFFE said the cost would have to be increased, but he was told they were not particular to a thousand or so. On November 10 Mr. MAJILTON arrived with his manager, and suggested the addition of a fourpenny gallery. Afterwards the scheme was abandoned, and 2 per cent. on the estimated cost was claimed. In cross-examination Mr. RADCLIFFE admitted that his partner wrote to him, "There is no doubt about it, it will come to quite double; and I think you ought to have stated it could not be done for the figure. I hope you stated that in your letters to MAJILTON. He may repudiate the whole thing as soon as he knows what the estimates are." Naturally, defendant's counsel took advantage of the confidential communication, and said it represented their case. Baron POLLOCK said he could not see how the claim could be enforced. An architect could not so far deviate from his original instructions without the absolute sanction of his principal, before whom the additional expense should be clearly put. It was, no doubt, hard upon the plaintiffs in one way. They had done some work according to defendant's instructions, but the scheme grew larger, and they no doubt sunk that work in the preparation of more comprehensive plans, which, if carried out, would have increased their remuneration. That the defendant declined to accept, as not according to his instructions. Judgment was therefore given for the defendant. The result is unsatisfactory, not only for the loss suffered by plaintiffs but as a further illustration of the consequences which are sure to arise when architects, as too commonly happens, prefer to trust to chance instead of having a definite understanding with their clients. It cannot be too often reiterated that before the law architects are simply agents for their clients, and they have no more right to arrange for a building to cost double the sum prescribed than any ordinary mercantile agent would have if he ordered goods to the extent of 1,000*l.*, when according to his instructions he was not to exceed 500*l.* An architect may consider that, as an artist, his fancy is not to be thwarted when he is eager to produce a masterpiece, but any one who takes that view should inform his client beforehand.

It is necessary for the survival of South Kensington that an immense number of students should be returned as "passing" the examinations. "Results" are therefore sought after that will be deemed satisfactory by officials, not the advantage of the students. The examination papers, which are supposed to be tests, may appear difficult to the uninitiated, but when it is known that they cannot differ much from papers which are printed and circulated by the Department, the difficulty is more apparent than real. To make the examinations still more easy, answers as well as questions are to be made available. A sample volume relating to building ("Building Construction: Key to Examinations of Science and Art Department," by HENRY ADAMS, M.Inst.C.E., &c. CHAPMAN & HALL, Limited) has been sent to us. According to the author, "every question given in the examination papers of both the elementary and advanced stages during the last thirteen years is here stated with its diagram exactly as given, and the solution of each has been carefully worked out and reduced for printing to about one-half, so that candidates may know precisely what is usually asked for and how they are expected to work their answers."

If the style of answering were alone to be suggested, it would not be necessary to give so large a number of reprints. Students will look on the book as a sort of store containing all the answers they are likely to need for the winning of prizes and honours. As there are three hundred and thirty-eight problems, examiners can hardly think on a subject that is not illustrated. Mr. ADAMS, it must be allowed, has done his model answering creditably, and he must be a dunce who cannot cram himself with the help of the book so as to satisfy the kindly band of examiners. We may expect that the usual complaints about the strange replies will be omitted from annual reports for the future. They were becoming monotonous. Technical education will appear to have received a fresh impetus, but after glancing at Mr. ADAMS'S "Key" we are afraid architects and builders will not appreciate the distinguished students of the Department's classes of construction.

At the annual meeting of the proprietors of the Manchester Royal Exchange the chairman, Mr. D. MATHESON, explained the expenditure of 5,613*l.* on account of alterations. They comprised the erection of two galleries and the entire reconstruction of the smaller domes, which were now completed. The additional light obtained from the domes was an inestimable advantage to members of the Exchange, and the alteration had given general satisfaction. Ventilating fans had also been provided for the domes and lavatory, which would greatly improve the sanitary condition of the building. An important work undertaken by the directors during the past year was the lighting of the Exchange with electricity. Although the contracts for the installation exceeded 1,200*l.*, the directors felt that so important an improvement could not have been wisely postponed. The expense of maintenance would necessarily be more than the cost of gas, and if the present high rate of charge for electricity was maintained by the Corporation the directors might find it an advantage at a later stage to put in the plant requisite to provide electricity for their own requirements. The directors had also been compelled to undertake the repair and improvement of the whole system of drainage of the Exchange, and of the shops and cellars which formed part of the building. The work was now in progress under the direction of the architect, Mr. MURGAT-ROYD.

SPORT is so attractive, the exhibition of drawings of the "big game" of America which is now open at the Burlington Gallery should be a success. There is much which is excellent among them. To many visitors the series of drawings by the late Mr. WASHINGTON FRIEND will be no less interesting. He had the good fortune to visit America before it was transformed, and his records of the primæval forests and other scenes are not only picturesque but novel. Spots which are now occupied by bustling towns were seen by Mr. FRIEND in a condition of quietude that has passed away. The QUEEN and several members of the Royal Family have shown their appreciation of Mr. FRIEND'S work by purchasing examples.

COLERIDGE ON ART.

WE are told by DE QUINCEY of a description which COLERIDGE gave him of a set of plates known as PIRANESI's "Dreams," and etched during a fever. They represented a series of vast Gothic halls. The artist was perceived groping his way up one of the staircases, which ended in a landing that was without balustrading or other protection, and his destruction appeared to be inevitable. However, a second flight was seen above similarly arranged, and PIRANESI was standing on the brink of the abyss. Successions of stairs followed, which the doomed man was compelled to ascend without the hope that his weariness would finally come to an end in rest. A metaphysician, and especially one like COLERIDGE, could not help being impressed by an invention of that kind, nor was he ever likely to forget it. The interminable process of ascending through colossal vaults to an unknown and incomprehensible region would recall speculations about time and space and other subjects where no goal is to be reached. The plates would also fascinate COLERIDGE on account of their architectural character. Although he could be described as being compact of imagination alone, and out of place in a material world, COLERIDGE appreciated the work of Mediæval builders at a higher value than most of his contemporaries. A man who was so unworldly did not possess the knack of compelling men to agree with him, and accordingly his influence on the revival of Gothic was infinitesimal if compared with WALTER SCOTT'S. But neither in verse nor prose has SCOTT revealed such intensity of feeling before Gothic masonry as we find in occasional remarks by COLERIDGE.

SCOTT, however, possessed one advantage over COLERIDGE. When he admired a mountain or a mullion he could express his thoughts frankly without any fear that he would be considered a simpleton. His readers, like himself, believed he had revealed the whole mystery of Mediæval architecture when he wrote:—

Thou wouldst have thought some fairy's hand
'Twixt poplars straight, the osier wand,
In many a freakish knot had twined;
Then framed a spell, when the work was done,
And changed the willow wreaths to stone.

SCOTT was so honest a man he would not take the whole credit for a theory so ingenious, which made the architect draw inspiration from the basket-maker, and he acknowledged his indebtedness to an essay by Sir JAMES HALL in the "Edinburgh Philosophical Transactions." Poor COLERIDGE could not be satisfied with that sort of admiration. He believed in spontaneity for the finest efforts of mental action, admiration being among them; but he felt compelled to restrain himself until he was satisfied why he should admire a work of art, and whether the artist had adopted the right course to insure admiration. It was this characteristic which CARLYLE described with grim humour as the accumulation of formidable apparatus, logical swim-bladders, transcendental life-preservers, and other precautionary and vehiculatory gear for setting out, and which were more likely to make COLERIDGE deviate from his course into infinitude or nowhere than to help him to arrive at any definite end.

COLERIDGE could well ask what is the use of devising a philosophical system, as I have done, unless it can be applied in answering questions about art as well as more abstruse things? There is no doubt he possessed a system, and was always joyful to exhibit its applicability, but it was, like the bow of ULYSSES or the papers which are so constantly lost in London, of no use to anybody but the owner. "My system," COLERIDGE said on one occasion, "is the only attempt ever made to reduce all knowledges into harmony," and he looked forward to the time when it was to be accepted as a sort of sun enlightening the various philosophical planets. At another time he said the object of it was to make the senses out of the mind, not the mind out of the senses, as had been done before.

COLERIDGE may have had the vision of PIRANESI in his mind, for he somehow shirked obedience to the impelling force, and in expounding his system he did not ascend very far. He was always promising himself a time when he would set about the task and realise his aspirations to be a law-giver or light-bringer from above, but the ascent

scared him. Men whose business it is to explain systems find it is toilsome work to explain them when there are ample expositions, and they cannot be expected to take the will for the deed in cases which have not got beyond the embryo condition. Consequently, COLERIDGE's name is dropped in treatises on psychology and histories of philosophy. It is possible, however, to have a glimpse of principles which will help us to understand his views about art.

In the first place, COLERIDGE insisted on the existence of a principle or law which was to serve as a guide in all operations. It was to be "a truth in the mind itself pregnant with the consequences of other truths in an indefinite progression." The pure sciences afforded examples. No less important was theory, "in which the existing forms and qualities of objects, discovered by observation, suggest a given arrangement of them to the mind, not merely for the purposes of more easy remembrance and communication, but for those of understanding, and sometimes of controlling them." The scientific arts or sciences exhibited relations of theory. Between the two "lies the method of the fine arts; a method in which certain great truths, composing what are usually called the laws of taste, necessarily predominate, but in which there are also other laws, dependent on the external objects of sight and sound which those arts embrace." The well-known remark by COLERIDGE about painting being the intermediate somewhat between a thought and a thing has been commonly taken to be only a witticism: it really corresponds with the division which he laid down and which we have just given. We are told that in a picture gallery he would say, after looking at a work of one class, "There's no use in stopping at this, for I see the painter had no idea; it is mere mechanical drawing," while before others he would exclaim, "Here the artist meant something for the mind."

It is not easy to discover whether the idea was to be something that could always be treated as of one class. That word has been the cause of countless errors, or at least has given rise to countless controversies, and COLERIDGE is not more precise on its use than the majority of philosophers. He tells us the idea may exist in a definite form, like the circle in the mind of a geometrician, or "it may be a mere instinct, a vague appetency towards something which the mind incessantly hunts for but cannot find, like a name which has escaped our recollection, or the impulse which fills the young poet's eyes with tears, he knows not why." Now in art COLERIDGE appears to have the fullest faith in the old Italian principle of multitude in unity, *il più nell' uno*. Of course he recognised that there must be subordination, but his objections against certain works of art generally arise from a belief that the artists, in determining degrees, were not always just or faithful to principles, and preferred to please themselves. Thus we find him remarking on CLAUDE'S system of giving so much prominence to the atmosphere as to make it substantial as the rest of the scene. Hence some of his sunsets produced a close and suffocating effect on COLERIDGE. The earthly character of RUBENS'S genius seemed to him in its right place when inspiring a *Triumph of Silenus*, which was unmitigated animalism. For the same reason he admired RUBENS'S landscapes as being in keeping with common objects. But RUBENS as a painter of gods and goddesses, nymphs or heroes, was out of his element, and degraded the subjects instead of exalting them. "Believe me," he said in one of his early lectures, "you must master the essence, the *natura naturans*, which presupposes a bond between nature in the higher sense and the soul of man." But that was not to be attained by fixing on a particular form for constant imitation, like CIPRIANI and others, who were esteemed as realists. JOHN MARTIN'S designs he condemned because of the evident dissatisfaction of the painter with everything that was not prodigious. COLERIDGE does not appear to have remembered how much importance is attached to the characteristic in art, or how often it is connected with defects. There never was a painter of any account without mannerisms which are generally departures from ideal excellence, although admirers have a weakness for them. The same phenomenon is witnessed in literature. The mannerism may have as little to recommend it as that peculiarity of sound which arises when materials assert themselves in musical instruments, but in a world where so

much is fallible neither painting nor music can be expected to attain perfection.

The respect for law and theory which COLERIDGE advocated, because without it chaos would come again, made him an admirer of the established rules which used to be employed in the planning of pictures. They became for him illustrations of the *thesis* and *antithesis*, which he held to be conflicting life principles that are essential for all things. Let the figures of a painting be arranged within geometrical figures such as a triangle or a circle, but if care is taken to avoid stiffness of grouping by variety of life, motion and passion, then the feelings as well as the judgment or perception will be gratified. He cites as an example RAPHAEL'S *Galatea*, of which we gave a print a fortnight ago. As the majority of our readers must have observed, the line of limitation in that work is not the triangle but the circle. COLERIDGE had evident delight in pointing out the plan in the essays he wrote for a Bristol paper in 1814, as will be seen from the following:—

In Raphael's admirable *Galatea* the circle is perceived at first sight, but with what multiplicity of rays and chords within the area of the circular group, with what elevations and depressions of the circumference, with what an endless variety and sportive wildness in the component figures and in the functions of the figures, is the balance, the perfect reconciliation effected between these two conflicting principles of the free life and of the confining form. How entirely is the stiffness that would have resulted from the obvious regularity of the latter fused and (if I may hazard so bold a metaphor) almost volatilised by the interpenetration and electrical flashes of the former. But I shall recur to this consummate work for more specific illustrations hereafter.

Unfortunately COLERIDGE did not keep his promise in respect to the *Galatea* more faithfully than in other important cases. We can see from his criticism that in spite of his scanty acquaintance with the operations of painting he surpassed most amateurs in his enjoyment of a fine picture. It therefore seemed to him to be remarkable that MILTON, who was one of his idols, while displaying a love of music, so often avoids noticing the great painters of Italy, whose works he must have seen, and does not appear to recognise painting as an art. COLERIDGE held that poetry appealed to us under three forms, viz. as poetry of language, poetry of the ear or music, and poetry of the eye, comprising plastic or sculpture, and graphic or painting, while having a common essence. It seemed to him that MILTON and all poets were bound to have a similar theory.

He took care, however, that MILTON should be on his side when treating of architecture, for he wrote an imaginary dialogue which was supposed to have been held between the great poet and a puritan in front of the cathedral of York, which was one of the buildings most admired by COLERIDGE. To all the objections raised by the puritan about the absence of the beauty of holiness from the cathedral, the toil that the erection imposed on thousands of poor creatures, the pride of the clergy, and so on, MILTON simply replies, "It is very beautiful," and afterwards he expressed another of COLERIDGE'S doctrines about art:—

I did not call it good, nor have I told thee, brother, that if this were levelled with the ground, and existed only in the works of the modeller or engraver, that I should desire to reconstruct it. The GOOD consists in the congruity of a thing with the laws of the reason and the nature of the will, and in its fitness to determine the latter to actualise the former, and it is always discursive. The Beautiful arises from the perceived harmony of an object, whether sight or sound, with the inborn and constitutive rules of the judgment and imagination, and it is always intuitive. As light to the eye, even such is beauty to the mind, which cannot but have complacency in whatever is perceived as prefigured to its living faculties. Hence the Greeks called a beautiful object *kalon*, quasi *kaloun*, i.e. calling on the soul, which receives instantly and welcomes it as something connatural.

To COLERIDGE architecture appeared as exhibiting the greatest extent of the difference from nature which may exist in works of art. It involved, he said, all the powers of design and is sculpture and painting inclusively; it showed the greatness of man and should at the same time teach him humility. COLERIDGE was enabled to travel and he gazed upon many of the Classic churches abroad as well as on Mediæval buildings in England. The effect of the two varieties of buildings on his mind is best described in his own words:—

When I enter a Greek church my eye is charmed and my mind elated; I feel exalted and proud that I am a man. But the Gothic

art is sublime. On entering a cathedral I am filled with devotion and with awe; I am lost to the actualities that surround me, and my whole being expands into the infinite; earth and air, nature and art, all swell up into eternity, and the only sensible impression left "that I am nothing."

COLERIDGE was not the man to be satisfied with saying he was affected until he became humble in spirit by an architectural work. He would understand how thesis and antithesis, mesothesis, prothesis and synthesis operated in producing that result. He found diversity developing into unity in two different ways, for Classic details are very different to Gothic in expression and effect on the mind. His endeavour to explain his states of mind before two varieties of architectural art is one of the most interesting to be found:—

In the Pantheon the whole is perceived in a perceived harmony with the parts which compose it, and generally you will remember that where the parts preserve any distinct individuality, there simple beauty or beauty simply arises; but where the parts melt undistinguished into the whole, there majestic beauty or majesty is the result. In York Minster the parts, the grotesques, are in themselves very sharply distinct and separate, and this distinction and separation of the parts is counterbalanced only by the multitude and variety of those parts by which the attention is bewildered; whilst the whole, or that there is a whole produced, is altogether a feeling in which the several thousand distinct impressions lose themselves as in a universal solvent. Hence in a Gothic cathedral, as in a prospect from a mountain's top, there is indeed a unity, an awful oneness, but it is because all distinction evades the eye. And just such is the distinction between the "Antigone" of Sophocles and the "Hamlet" of Shakespeare.

After reading the foregoing extract, it seems probable that, in spite of his efforts to be impartial, COLERIDGE'S bent was towards Gothic, which he believed was a sublimer effort of genius than the Greek style. We imagine that to his mind it required far greater power to produce unity of effect with the variety of sculptured details that are necessary in a Mediæval church than with the fewer and simpler parts of a Greek building. That view would also explain his preference for King's College Chapel in Cambridge. The intricate vaulting would be likely to appear incomprehensible to COLERIDGE when it was scrutinised, and yet the general effect was one of extreme unity.

It was unity of effect which he considered was the indispensable requisite of sculpture as of architecture. COLERIDGE was something of a Gothicismist in that art also, for he was apprehensive that imitation of the antique would keep the attention fixed on externals rather than on the thought within, would induce efforts to combine incongruous things, such as modern feelings in antique forms, and because antique sculpture was like a dead language, and could not be impressive except to a few. At a time when Classic robes were supposed to be indispensable for statues of Englishmen, he maintained that "a skilful adoption of modern habiliments would in many instances give a variety and force of effect which a bigoted adherence to Greek or Roman costume precludes."

Much more might be said on the subject, but we hope we have given evidence enough of COLERIDGE'S discernment at a time when art was neglected, when, as he said in sorrow, "the darkest despotisms on the Continent have done more for the growth and elevation of the fine arts than the English Government." Happily, we live in days that are more favourable, and some of the credit for the change should be credited to SAMUEL TAYLOR COLERIDGE.

THE SYDNEY NATIONAL GALLERY.

THE popularity of the National Art Gallery in Sydney is increasing. This fine collection was first instituted in 1871 in connection with the New South Wales Academy of Art. It was reopened as the National Art Gallery in 1880, and is now situated in one of the public reserves of the city, known as the "Outer Domain," in a convenient and well-lighted building, at present unfinished as regards the exterior, although steps are contemplated to complete the structure. The Gallery contains an excellent collection of paintings and statuary, comprising some of the most famous works of the best modern artists of the old world, and includes several very valuable gifts from private persons. Like the other national institutions of New South Wales, the Gallery is open on Sundays as well as week-days, and on the former and on public holidays the attendance is especially numerous. During 1892 it was visited by 250,109 persons, the Sunday attendances being 101,683, and those on week-days 148,426.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

JOHN NASH AND HIS CONTEMPORARIES.

IT has been the lot of John Nash to obtain a larger measure of repute than abler architects. Few Englishmen since Wren's time were permitted to display their powers on so immense a scale, and it is inevitable that while some consider he was successful, many others point to him as a failure. There is little doubt his transformation of a part of the Metropolis was, after the performance, accepted as one of those bold strokes which are accomplished only by artists of extraordinary genius. There is so much that is laudatory of Nash in the publications of the early part of the century that the following "Letter to John Nash, Esq., on the architectural improvements now making under his direction, between Carlton House and the Regent's Park, by an Architect," has the interest of being almost unique, and we reprint it as a curiosity.

Sir,—As an humble professor of that art in which you have such extensive practice and influence, I take leave to address a few observations to you, dictated by no sense of disrespect, but by a high feeling of the importance of a pure taste to the fame of our country; which feeling is of the more consequence in our noble art than in either of her more delicate sisters, as being more lasting and perpetuating the fame or disgrace of a good or bad taste in a greater degree.

Your official situation, sir, renders you a leader in art, and, as the successor of Wren, Chambers and Wyatt, the quantity and publicity of your works must have a great and lasting influence on the taste and character of high art, particularly in architecture; for if the fountain head is pure, so will be the lesser streams. The Parthenon and the Poikile, the Temple of Theseus and the Erechtheum, produced the sculptures of the one and the pictures of the other in the self-same style, and "produced fruit after their kind;" for the pure, the divine taste of the architect refined that of the painter and of the sculptor.

Shall we expect such fruit from the style you are so unhappily reviving? a style which all the best critics thought and fondly hoped, and which, but for you, would have been consigned to the tomb of all the Capulets. It matters not to me, sir, whether the details of your works are bad from choice or carelessness; for the whole, as wholes, are in general admirable, the character of your designs being like those of Vanbrugh, more painter-like and picturesque than most of your contemporaries; but alas! sir, the detail, the parts, the alphabet, the orthography of our art in your hands is defective, is graceless, and, like Vanbrugh's, is cumbrous and inelegant; as unproductive of its intentions as if the poetry of a Byron or a Southey were sent out into the world with (if it were possible) defective grammar and bad orthography.

Little, sir, was it expected after the introduction of the fine forms and pure proportions of Greece, by Stuart, Revett, Pars, Wilkins and others, who have revelled in the pure streams of Attic elegance, that Batty Langley and Payne would at this time, aided by the powerful talents of a Nash, have substituted the sophisticated spoliations of Roman barbarism for Grecian splendour and purity.

It is of little consequence, sir, as I have before said, whether these defects are the results of choice or indifference. An able defender of yours attributes them to the latter, and says that while you compose a grand whole, you care not what master's proportions you adopt. "A Doric is a Doric," says this critic, and an Ionic an Ionic, whether Greek or Roman, and the gentlemen who employ us neither know nor care for the difference. But, sir, they should know, and it is by such men as you, who have the lead, that they should be taught. I must at present follow, and perhaps my employer may dictate, but he shall never force me to compile mongrel edifices of his own bad taste, the shame of which must for ever attach to me. No, sir, even I, with whom commissions are rare compared with you, would throw up any rather than be so shackled; but it is for such as you, sir, to point out even where you can't reform, and where you cannot lead, reject. The Surveyor-General, the architect of the Prince Regent, will be followed; his taste, good or bad, will for a time be in fashion; therefore the style you adopt is of more consequence than may at first appear.

A Doric, I grant, is a Doric, and an Ionic an Ionic, whether from the Parthenon or the Colosseum, whether from the temple on the Ilyssus or the theatre of Marcellus, from the Temple of Concord or either of the temples of Minerva Polias. But Roman architecture, the Roman heresy, I would call it, knows neither; those mongrels which they have dignified with these names are like children stolen by gipsies, disfigured and misnamed. That there is a difference let the discerning judge, and it will require but a slightly practised eye to discriminate; it is as great and as distinguishable as the flavour of wines to

the refined palate, as the racy flavour of champagne or Burgundy, or the delicate shades of difference between the Château Margot and the Vin de Grave, contrasted with the lusty flavour of old port and hock, or the mawkish insipidity of elder or of currant wines. To such refined, unvitiated, or naturally pure tastes I would refer the cause, for I would no more submit to the opinions of one of Batty Langley's bench-mates for pure taste in fine art than choose wines on the taste and recommendation of a dram-drinker. To such refined tastes I appeal, even if they know no more of the art than to distinguish at sight an ovolo from an echinus,* which, it would appear to your friend just mentioned, are synonymous in use and therefore in beauty. Let us compare the Doric, that is, of any pure Greek specimen of their best days—(for instance, of the Parthenon, the Theseum, or the Propylea, all differing in dimensions, proportions and members, but not in character, in which most essential quality lie the errors of the Roman school)—with the very best of the Roman pseudo specimens—suppose yours on the south side of the Opera House; or for the Ionic compare the pure example from the little temple on the Ilyssus, near Athens, with the one which you have used opposite Carlton House, to say nothing of the omissions you have made of essential component parts and grand divisions of the order, without referring to even more splendid, though not more characteristic or beautiful examples of the temples of Minerva Polias or the Erechtheum at Athens and others. Again I would ask, can you prefer the Roman egg and anchor so elaborately laid down and geometrically explained by Gibbs and Batty Langley, to that of the more ancient, more beautiful, but later known specimens from Athens, the princely prototype of the Roman mongrels?

Chambers you may say, and Wren, perhaps you may add Palladio and Perrault, all used, beautified and simplified the Roman; true, but they had not seen nor known the Grecian. They selected the most beautiful of the known specimens, they divested them of the extraneous ornaments of the Colosseum, of the Theatre of Marcellus, of the Temple of Concord, and made them approach the simplicity though they missed the character of the Greek. No two things differ more than the Greek and Roman creed of the orders; beautiful spirals, lovely contours composed from ellipses, parabolas, hyperbolas and other conic sections, selected from the higher mathematics by the greatest mathematicians, compose all the parts of the one; clumsy quarter-rounds, circular and bolstered cima rectas and reversas, struck by a pair of carpenter's compasses, the other; the geometry of Euclid was as incapable of improvement by any of his successors as the architecture of the days of Pericles by the mechanics of the time of Marcellus, Trajan, Constantine or Diocletian.

Your crime, sir, for it is a crime in the realms of art, and a misdemeanour against good taste, is that of raising the Roman heresy from its just excommunication to the detriment of Grecian orthodoxy.

One of the admirers of your style asked me lately whether I would prostrate myself and blindly worship the Greeks, when a due admixture of the aridity of the one with the profusion of the other would give so much more elegant a result, as, for instance, a Grecian Doric column with the Roman Attic base? Such was his phrase, which is part of the phraseology and nomenclature of the Batty Langley school. If this were true, if such an union would produce such an effect and such a superiority, I would fall down and worship him. No, sir, never was there a more unnatural union proposed; this would be to be wedded to a corse; oil and vinegar have a greater affinity; it would be to encase a diamond in lead:—

Non possum ferre, Quirites,
Græcam urbem.—Juv. "Sat." iii.

Wren and Chambers, it has been said, were men of a refined taste, and the latter had seen enough of Grecian architecture justly to abandon such an ancient absurdity, such a primeval baldness, and to attach himself to the later improvements of the Romans. Yes, what had he seen? Perhaps only the delusions of Piranesi for the former, contrasted with his exaggerations of the latter. This artist, with all his talent and genius, has deceived many a warm imagination, and brought an unmerited contempt on the sterling and magnificent ruins of ancient Rome:—

Roma quanta fuit ipsa ruina docet.

Or perhaps he learnt his Greek through the pert Frenchman Le Roy's inventive blunders of the remains of Athenian Greece. Let it be remembered that Wren was not regularly inducted in architecture as a fine art, although as a science it had opened to him all its riches; he was perhaps the greatest mathematician and constructive architect of modern times, of which the

* It may, perhaps, be necessary to explain to the unprofessional reader that the echinus in Greek architecture (which is the contour of a parabola, or some similar figure) is always altered in the Roman style to an ovolo, or quarter-round, as the bench-mates call it.

mechanism of St. Paul's Cathedral, one of the most perfect models of construction in existence, the spire of Bow Church, the little beauty of St. Dunstan's-in-the-East, the turret-crowned towers of St. Michael, Royal College Hill, St. Stephen's Walbrook, and Garlick Hill, among many others, are incontrovertible proofs. Wren, a mathematician, an astronomer, a natural philosopher, a scholar, an amateur in architecture, was wisely selected to fill the very important office of His Majesty's Surveyor-General; knighthood became necessary to divest him of his learned title, and to convert Dr. Wren into the more courtly Sir Christopher; and study, he felt, was as necessary to change the able mathematician into the tasteful architect, and on the solid foundation of his skill in science to raise the edifice of a pure taste in the fine arts. This his intelligent mind and great self-knowledge well knew; he therefore prepared himself for his new vocation, and learnt from Vitruvius to seek for purity of style in ancient Greece, which he proposed visiting after Rome. Without this visit to the land of taste, elegance and sound principles his great and productive mind would still have succeeded; but he commenced his proposed travels, and unfortunately reached no further than Paris, where he contaminated his style with the puerilities of the French modification of the Roman school. From Paris he was ordered home, in consequence of the Fire of London, to rebuild the desolated city, and hence all his works partake of the French school. Here are subjects for reflection: had Wren—the highly-gifted Wren—visited in those days and studied the Parthenon, with Phidias for his guide, with Stone* for his builder and Gibbons* for his carver, what would not our Metropolis have boasted now? what would not have St. Paul's, with all its excellences of design and execution have been, had to all these excellences been added the purity of taste of the architecture and sculpture of Athens? He would have been the greatest architect the world ever knew. Yet this dawning of taste, this bright sunshine of purity, you would cloud with the mists of Scamozzi and the Italian school. You would render null and void the labours and rich importations of Stuart, Revett, Pars, Wilkins, Smirke, the invaluable accession of the Elgin Marbles, and go back to the days before we were blessed with their knowledge. But to return. In construction, in invention, in skill, in science, Wren stands pre-eminent, but in the fine arts, in taste, in decoration, he by no means excels. What can be excused in him cannot be pardoned in a Surveyor-General of the present day, nor should the clumsy ponderosities of the Roman school or even the purer taste of Chambers, who may be called the Palladio *reformato* of his day, nor designs that would scarcely admit their author as a probationer, much less a student, in our ill-constructed and worse-governed Royal Academy, be now seen issuing from the office and backed with the authority of His Majesty's Surveyor-General.

Such, sir, are the undisguised sentiments of one who highly respects you in every respect, but has a greater value for the fine arts of his country.—I have the honour to be, sir, your very obedient servant,

PHILOTECTON LONDINENSIS.

It will be observed that the criticism comes from a purist in detail, and leaves untouched the general flimsiness of Nash's work. Where a whole range of buildings is only mock Classic, would much have been gained by the introduction of mouldings copied from Greek buildings?

THE PROPOSED DESTRUCTION OF PHILÆ.

IN the *Manchester Guardian* of Monday we find the following remarks by Mr. W. St. Chad Boscawen concerning the fate of Philæ:—

The decree has gone forth that Philæ, "the pearl of Egypt," "the ever-praised but never sufficiently praised" island, shall disappear. In sober fact, the commission appointed to report upon the best site for the vast reservoir which is to store the life-giving waters of the Nile and make a garden of Upper Egypt, as the Barrage has of Lower Egypt, has reported in favour of the dam being made at the island of Shelleh, a few yards above the first cataract. By this means the level of the river will be raised to a height of several metres, and at high Nile the vast superfluity of water run into a reservoir which will fill the "summer canals" of Upper Egypt and enable cultivation to be carried on during the summer as well as in the winter and spring. Whatever may be the capable output of this water store, and it will require some three to four thousand million cubits of water per annum, the rise in the river will be of such a character as to flood to a considerable depth the beautiful island of Philæ and its temples. This may in some degree be modified, as Colonel Ross, R.E., has suggested, by making the rise more gradual, but this remains to be seen. Still as the project now stands the order is "Perish Philæ." To the traveller who has toiled up the Nile, especially if personally conducted, wearied with the endless panorama of half-

inspected temples and tombs and his ears ringing with the drone of the parrot-like dragoman, Philæ is a paradise. To the ancient Egyptians of centuries ago it must also have been the same; hence its name, Pa-alek, "the end, the termination," for it was the end of the pilgrim's voyage who had come from the north to visit the sacred home of Isis. It was the end in another sense, for it was here that Egypt proper ended, and beyond was the dark continent; so hither came the armies bound south to fight against the Ethiopians, to sacrifice for fortune. Those who have seen this island of temples can well understand how the ancient Egyptians made it the home of the lovely Isis. It is without doubt the most beautiful spot in the Nile journey. Here the blue rainless sky, the rippling river rushing on to the torrent of the cataracts, the waving palms and rich verdure combine with the stately ruins to form a picture which has inspired the brush of many famous artists. The Egyptians, ever sensible to the beauties of nature, placed here the grave of Osiris and the temple of the weeping Isis. From the earliest times, certainly those of the twelfth dynasty, the island was a place of pilgrimage, but it was not until later times, until the period of the revived empire under Nectanebo II. (B.C. 287), the contemporary of the Persians, that the great Temple of Isis was built. The buildings of Nectanebo are not very extensive, but are of great interest to archaeologists. The small hypostyle vestibule at the south end of the island, near the pilgrims' landing-stage, is curious on account of its assumed ancient style. Outside of this pavilion formerly stood two sandstone obelisks, one of which was removed by Belzoni and is now in the garden of Kingston Hall, Dorset. In addition to the inscription of Nectanebo, it bears a petition to Ptolemy Euergetes II. from the priests, complaining of the too frequent royal visits and the expense they entailed on the poor temple revenues. It is, however, to the Ptolemaic dynasty that Philæ owes most of its beautiful buildings. The most important of these are the Temple of Isis and the fine pylons leading to it. This temple was built by Ptolemy VII. Philometor, B.C. 181, but there are many later, down to the time of Tiberius, A.D. 14. This temple is called the birth-house (Meshen), and similar chambers are found at Edfu and Denderah. This is by far the most interesting portion of the temple. Here we see all the scenes connected with the birth and nursing of Horus. In one scene we have the infant child Horus born in the presence of the great gods, Amen and Thoth, descending from the lotus flower. In another we see a goddess, probably Isis, nursing the child, while Hathor, the patroness of birth and fairy godmother of the Egyptian pantheon, is patting her hand affectionately on the child's head. The presence in the groups of Ptolemy IX., who stands beside Hathor, and of his sister and wife, Cleopatra I., shows that we have here really, blended with the old Horus myth of Egypt, the according of divine protection to the new-born Pharaoh. Not only have these sculptures preserved a Ptolemaic myth, but they have furnished the basis of a curious modern Arab legend. The curious story of Anas-el-Wogud, the beautiful youth who pursues the beautiful but ever-fleeing maiden Zahr-el-Ward, "the Flower of the Rose," is located at Philæ. Like Osiris, he comes to the island on the back of a crocodile; here the mummy of Osiris is represented carried on the back of a crocodile. Here the lady escapes from her prison, where her father had hidden her, by a rope made of her clothes. Eventually they meet, and are married with the paternal blessing, and, as the Arab writer poetically puts it, "So they lived in the bosom of happiness to an advanced age, in which the roses of enjoyment shed their leaves and tender friendship must take the place of passion." According to Arab tradition the birth-house already described was their bridal chamber. Surely it will be a pity to lose so interesting a chamber, the centre of so many poetic legends.

It is impossible in the limits of a single article to describe the many points of interest in this great temple. One other room, however, must be described. This is the small cella and vestibule on the west of the Hypostyle hall. Here we have Horus receiving the waters of life from Isis and Nephthys after his birth, and Thoth writes his name on a palm leaf. But of more interest is a sculpture which may be called a very early example of landscape, in a scene representing the rising Nile. There we see one of the cataract islands, with its rocky cliffs, with a cave in its lower part. In this is the figure of the Nile god holding two vases in his hand and guarded by a coiling serpent. From the vases flow the two streams of the river. Above are the vulture of Muth and the hawk of Horus keeping guard, and below the inscription "The very distant and very sacred who rises in Senem." There is one other building in this beautiful island which we shall miss with regret. It is the beautiful little kiosque known as "Pharaoh's bed." This beautiful open pavilion chapel of Hathor is known to all who have visited the island. It is a work of very late date, being of the time of Nerva Trajanus. Here, in evidence of Greek art, we see, as Ebors remarks, as it were "a line of Homer among the hieroglyphic inscriptions." The kiosque is perhaps the best known part of Philæ, painted by thousands of artists,

* The master mason and principal carver of St. Paul's.

visited by thousands of tourists, the scene of many a merry luncheon party. It will indeed be missed with deep regret when submerged beneath the waters of the Nile. The order "Exit Philæ" will no doubt cause much regret and some indignation among archaeologists and artists who know Egypt; but let them remember what the work to be undertaken means. It means new life to Upper Egypt, it means the conversion of thousands of acres of desert land into a garden, it means Egypt freeing herself from the mountain of debt which has crushed out all her life. If it is to be as the commissioners decide, let us rescue all we can of this beautiful temple. Some suggestion has been made of rebuilding the ruins elsewhere. This is on the face of it absurd. Certain chambers, such as those mentioned in this article, might be removed, and the "Pharaoh's bed" also. What should be done is that a thorough exploration of the site should be made, and casts taken of all that is worth keeping, and then we must bow the head as the sacred river closes its waters over the home of Isis and once for all "Exit Philæ."

ARCHÆOLOGY IN BERKS.

THE annual report of the Berks Archæological and Architectural Society states that the past year has not been marked by any events of exceptional importance. The restoration of the ancient Hospitium at Reading, now used as the University Extension College, has been effected under the careful and able superintendence of Mr. S. S. Stallwood, architect, but the committee regret to observe that the corridor, which was to have been constructed as a memorial to the revered memory of Mr. W. I. Palmer, formerly president of the College Council, by the working-men of Reading, has been abandoned for the present through want of funds. No other building deserving of special attention has been erected during the year within this district. One church of note—that of Lambourne—has been almost completely restored, and it is earnestly to be hoped that the proposed addition to the municipal buildings at Reading may redeem the architectural mediocrity of their other portions. The excavations at Silchester are still in progress under the direction of the Society of Antiquaries, and we are glad to report that substantial assistance has been rendered in Reading to this undertaking. The publication of the registers of the ancient parish church of St. Mary, Reading, undertaken by the Rev. G. P. Crawford, a work of considerable value to the local antiquarian and genealogist, has now been completed, and it is proposed to undertake, in continuation, the registers of St. Laurence's Church, Reading, dating from 1603. It is probable that the Parish Councils or Local Government Act recently enacted may raise the question as to the proper custody of these valuable parochial documents. We strongly deprecate their removal to a metropolitan centre, like the Record Office, and are inclined to support the proposal that, if removed from their present custodians, they should be preserved in a special county registry, under the care of the County Councils. Notwithstanding the long and serious illness of the valued secretary, the Rev. P. H. Ditchfield (from which he has now happily recovered), the Society has pursued its threefold object—(1) of contributing papers on architectural subjects and the personal inspection of historic sites; (2) the encouragement of architectural and historical study; (3) the publication of original articles in the *Quarterly Journal*. The Society has endeavoured in every way to fulfil the duties entrusted to them by the Corporation of Reading in committing to their charge the Abbey Gateway, a most interesting relic of our ancient abbey at Reading. A large number of visitors, including several Americans, have been conducted over the abbey ruins and allowed to inspect the gateway. The officers of the Society are prepared at any time to give a hearty welcome to schools or parties of working-men who wish to be conducted over the ruins. Inquiries are frequently made by strangers for information concerning the abbey and other antiquities of the town, which entail a considerable amount of correspondence from our official headquarters. In addition to these duties it is our endeavour to utilise the large room over the gateway as much as possible for educational purposes. It should also be mentioned that the Society has furnished the Corporation with the necessary information respecting the detailed portions of the abbey buildings so as to affix notice boards for the guidance of strangers. The usual prizes have been awarded by the Society for an historical essay and for proficiency in architectural drawing. It has not been found practicable to grant any donations during the past year towards the restoration of public buildings, but the Society has contributed a small sum towards the Silchester Exploration Fund, and has also made some small additions to the reference library. The stationary condition of the library is the less to be regretted because an important section of the public library is now devoted to works of a local character. The Society cannot omit this opportunity of expressing its obligation to Mr. W. H. Green-

ough for his unceasing efforts to make the local collection as complete and as full as possible. A valuable collection of manuscript notes, compiled by Miss Thoyts, has recently been added to this section of the public library. The articles in the *Quarterly Journal* have been of unusual interest and the circulation of the journal has considerably increased. The inventory of church plate, conducted by the Rev. E. R. Gardner and Mr. A. J. Dasent, is in progress and will probably be published as a separate work. There is a slight decrease in the number of members of the Archæological Society on our books as compared with last year. The financial position is more satisfactory, although a small balance of 9*l.* 9*s.* 6*d.* is still due to the treasurer.

IRISH GEOLOGY.

A LECTURE has been delivered on the "Scenery and Geology of the County Cork" by Mr. J. Porter, B.E., to the members of the Cork Literary and Scientific Society. He said that when they glanced at the geological map of Ireland the first thing to catch their eye would probably be that bright patch of crimson which marked the volcanic rocks of the north-east corner, and apart from the colour effects of the map-creator there was undoubtedly something impressive in the spectacle of a country, which had been overwhelmed by the fiery deluge. Even when the lava has become frozen into rigidity and exposed to the weather for many centuries it still maintained in its rugged outlines the constant suggestion of subterranean heat. But it was not the land of the Giant's Causeway which was to engage their attention that night, but they should go to the other end of that measuring line which in their school days they were taught to draw from Fair Head in Antrim to Mizen Head in Cork. The more tranquil geological history of the premier county might possess sufficient interest to repay them. The south-western highlands of Ireland were marked on the geological map by a peculiar drawing out of the colours into a series of bands running nearly east and west, which arrangement did not by any means stand by itself. On the county map of the Ordnance Survey they would notice the east and west direction of the main valleys, rivers, and lines of communication, the alternation of long and narrow peninsulas, with equally long and narrow bays. It would be their main business that night to connect these peculiarly marked features of the ground above with the structure of the rocks beneath. With the exception of such superficial deposits as sand and gravel and soil, all the rocks of County Cork belonged to the older divisions of the geological series. The index of age in the case of stratified rocks was found in the character of the fossils which they contained. These guides had led to the following classification of the Cork rocks:—Coal measures, carboniferous limestone and slate, Kiltorean beds, old red sandstone, Dingle beds, Lower Silurian, volcanic rocks. The Lower Silurian rocks were only represented by a tiny patch in the north and would not engage them any further, but the Dingle beds, as shown in brown on the map, covered more ground than many of the others. Their name was derived from the peninsula in Kerry where their relations to the other rocks could be best seen. They consisted of a series of shales, grits and conglomerates, rocks made of hardened mud, sand and pebbles. Their thickness varied from 3,000 feet in the east of the county to 10,000 feet and more among the Cabra Mountains in the west. Their exact age was yet a matter of doubt, for the fossils were few and ambiguous in their testimony. They had a small area in the north-east of the county, which is occupied by rocks of undoubted old red sandstone age. The Dingle beds were formed under water, like all other stratified rocks, but great changes took place in the sea-floor after they had been deposited, and they were slowly raised into the region of the air, where no further deposit was possible, but where, on the contrary, there was

The sound of streams that, swift or slow,
Draw down Æonian hills, and sow
The dust of continents to be.

The southern half of the county was afterwards submerged and covered by the deposits which were formed in a large fresh-water lake which extended eastwards beyond Kiltorean, in the county of Kilkenny, but the northern portion remained above the water level, and only sank as the carboniferous period was ushered in. There could be no doubt but that the coal measures formerly extended far to the south. Small patches, the remains of a once continuous sheet, were to be found near Ballinhassig, Bandon, the Old Head of Kinsale and Bantry Bay. The Bandon coalfield actually yielded some coal, but the agent of the Duke of Devonshire rather unnecessarily stopped its working. The essayist then proceeded to deal with the arrangement of the stratified rocks in Cork, showing their wavy structure very clearly. There were two reasons why the rocks of the country had not been reduced to masses of broken skivers during the upheaval. The first was that the great earth below, which constitutes the mountain range, is formed with extreme slowness, and the most subtle substances could be

bent, if only time enough was given them. The second reason was that the load of rock overhead, which had since been stripped off, exerted at the time a pressure so heavy that fracture was rendered difficult. When they examined the geological map of the county they found that with a few exceptions all the higher ground was composed of the Dingle beds. Owen Hill, which stood unapproachably among the mountains of Cork for beauty of form, was carved out of an arching fold of the Dingle beds. Cullenagh Lake, from which the infant Bandon river emerges, suggested to them in the wooded mountain which overlooked it something of what Gougane Barra must have been when the name Dereen, included in half the townland names of the district, was not a misnomer, and the foliage of the oak trees on every hill-slope lent by its deeper hue to the charm of contrast to the vivid green of the valley of Desmond. The highest mountain of the Dunmanway group was next described. The great longitudinal valleys in the south of the county which contained the main waterways, the principal towns and the chief lines of communication, were all floored with the dark slope, the dividing ridges between being formed of anticlinal arches of the more enduring kind. Dingle beds, volcano rocks and land sculpture were interestingly dealt with. In continuation the lecturer said:—Now, to pass from single streams to river systems, there was a process at work in all countries, but specially marked in those where the folds of the rocks were nearly parallel, which tended to concentrate the drainage into a few systems. Its working was much too long and complicated to describe, and he would simply remark that its result had been to divide the drainage of the country into the transverse streams which formed the sides of the great east and west ridges of the longitudinal streams which run for miles in an east and west direction, and received the contributions of all the transverse ones. The Blackwater, for instance, received the discharge of a score of separate fair-sized streams during its course across the country in its great longitudinal valley. There was also a process of amalgamation going on in all river systems which tended to reduce the number of streams to a few. That process went on much more rapidly where the slope of the surface was low than where it was high. They now came to a point of great importance. Suppose two transverse valleys on the opposite slopes of a ridge chance to head directly back towards each other, the result would obviously be to make a gap right across the ridge in the course of time. Such gaps were numerous among mountains, and to them was due the cutting up of a ridge into separate peaks. From the outline of the Sugarloaf they could see that its true form was that of a ridge which three or four pairs of torrents had cut up into peaks. The Clyda and the Martin rivers were jointly responsible for that droop in the main watershed of the county through which the Great Southern and Western Railway line had been carried. The road from Macroom to Millstreet was led through a glen whose summit elevation was only 700 feet, while Mushramore rose immediately to the east to a height of over 2,000 feet, and Musherabeg, on the west, reached nearly 1,600 feet. There was one valley which had always appealed to observers with a peculiar fascination—the pass of Keamaneigh. Its primeval wildness recalled the time of bonnought, kern and gallowglass, and its gloom was in keeping with that tragic story of a wifeless and childless old man killed by a reckless pistol-shot. The county of Cork was but on the fringe of the great ice-sheet. The mountains of the west bore frequent testimony in the smoothing of their rocks to the passage of the glacier. The hills of lower elevation owed the final touches of their rounding to that agency. The limestone showed few of those castellated rocks so common on its surface in countries which the ice-sheet had not invaded. Striking as were some of the evidences of glacial action, the chief instrument in the land sculpture was water and not ice. Through every variation in the coast-line where the low cliffs of marly clay at Youghal were swept away in huge masses by every winter storm, or where bay and headland and skerry attested the power of Cleena's wave as it broke in foam against the rocks of Sheela, there was the universal impress of water. The smiling plains of the east owed their existence and their fertility to the brooks which flowed

By many a field and fallow,
And many a fairy foreland set
With willow, weed and mallow.

But the descriptions of the poet born and reared amid the luring streams of the Fenland are out of place amid the mountains of the west. Their gloomy defiles and torrent-scarred slopes called up rather visions of the Gaelic warrior bard as he gives utterance to the voice of

Turthon's stream,
That sent its sullen roar by night
Through Gormal's misty vale.

A Collection of views of Birmingham in the early part of the century is now on view at the Municipal Art Gallery.

TESSERÆ.

The Chambered Tumulus of Maeshowe.

WHEN in 1861 a deputation from the Society of Antiquaries of Scotland penetrated to the central chamber they found it covered with Runic inscriptions, most of which were apparently engraved by pilgrims from Norway, who had landed in the Orkneys on their way to Jerusalem, it is generally supposed in the twelfth century. Owing partly to the indistinctness of the record, partly to the difficulty of deciphering short detached sentences, what they tell us of the history of the monument is by no means satisfactorily determined. A fair inference, however, from the whole seems to be that it was raised in honour of, or for the burial-place of, the sons of (Regnar?) Lothbrock, by Ingibjorg, his (?) widow. If this were so, it would place it a century earlier than the tombs of Gorm and Thyra at Jellinge, which it resembles in every essential respect except one. The Danish monument being erected in a country abounding in wood and where stone was scarce, the chamber is formed with timber. In the Orkneys, on the contrary, timber does not exist, but stone is found everywhere, which splitting easily into rectangular blocks with smooth faces is most suitable for the purpose. Bearing this distinction in mind, the comparison of the two monuments with the whole aspect of the place and its inscriptions seems to place it almost certainly in the first half of the ninth century. The pilgrims being Christians would have no hesitation in breaking into and plundering the sepulchres of their pagan forefathers; but they would hardly have chosen it for the place of such elaborate engravings if they had not known that it belonged to their own people. Whatever inference may be drawn from these facts, there is a figure of a dragon on the right hand facing the entrance which may go far to settle the question. That it is Scandinavian no one doubts. There is a similar dragon on King Gorm's stone at Jellinge, and another at Hunestad, in Sweden, which may belong to the eleventh century, but both these are undoubtedly more modern than the Maeshowe example. This last therefore could hardly have been engraved by the "Iorsala farers," as the Jerusalem pilgrims call themselves, but would suit perfectly to the theory that the Howe was erected by the Lothbrocks, or belonged to their age.

The Academy of Siena.

The old "Università de' Dipintori" of Siena, though probably the most ancient of all modern academies, was, perhaps, the most arbitrary and exclusive. Family tuition, if apprenticeship may be so called, was the only species of instruction then adopted; but every youth, before he could be admitted into apprenticeship, was obliged to swear always to keep the statutes of the corporation, and to abide by the decision of the rector, who had authority to impose fines in all cases of misdemeanour, and had also the power of expulsion from the community, in which case the expelled could not practise his art in the territory of Siena. These powers were awarded by the State in the Breve, or deed of incorporation, and could not be resisted. No stranger could practise his art in Siena without a special license from this society; the price of the license was a gold florin, and it appears to have been valid only for the particular engagement, or at least visit, from which it was granted; but a stranger might be received as a member into the society. The society of sculptors was distinct, but was similarly constituted. All members of these societies were eligible to fill the offices of their signoria or government in rotation. The rector, or rectors, were assisted by a council of thirteen members, three of whom were the rector's counsellors; and each society had also its treasurer, who was at the same time its secretary. The offices were held by election, for six months only; it was not allowed to vote for your own relation or partner to fill the office of rector, and no member was re-eligible until after the expiration of three years. The officers were paid for their services; the rectors received twenty florins each, and the treasurers fifteen. The society of sculptors had three rectors. All disputes or doubts relating to the estimation of work done or contracted for were settled by the signory of the society; it appears even, from one part of the statutes, to have regulated the price of all work and to have levied a tax upon the amount, which, of course, was really paid by the employer or purchaser, as a proper allowance would be made for the tax in the estimation of the work. The highest fine mentioned in the statutes is forty florins, something less than four pounds, but this in the thirteenth century was a very large amount. For disobedience to the rector the fine was ten florins; the large fines were provided against a breach of trust of the rectors or treasurers. The following instance will serve to show the value of money at this time:—In 1296 a painter was paid, at Siena, only six lire, about five shillings, for painting a figure, most probably in distemper, of St. Christopher, in the court of the signory house. The other old company of St. Luke was very similarly constituted to this of Siena.

NOTES AND COMMENTS.

THE Town Council of Crieff may be considered to have received a snubbing from the Board of Supervision, which is almost as important as the English Local Government Board. The offence which was the cause of the reproof is not uncommon of late years in all parts of the country, for it was one of those cases where a local body shows indifference to other bodies no less respectable. An offer to build a hospital for infectious diseases was accepted by the Town Council. The site assigned for the building was in front of a Board school. Naturally the Board, the relatives of the children, and the proprietors of the neighbourhood appealed for protection to the Board of Supervision, as the Town Council remained obdurate. After hearing all parties, it has been decided that it would be inexpedient to have the hospital erected on the site proposed. The Board of Supervision suggest that the Town Council would do well to consider whether, in the interest of the burgh itself, it would not be advisable, in selecting a site, to have regard to the objections which have been taken to the present site by a large section of the community. In other words, it is not advisable for town councillors to imagine that they are the only authorities to be satisfied. It would be well if in London the advice was likewise accepted.

THE report which Mr. W. MATHER, M.P., has prepared on the year's experiment of working forty-eight hours weekly, which was tried at the Salford Ironworks, is an important document in the history of industrialism. From time to time experiments of the kind have been attempted, but on a small scale. The report relates to one in which the conditions were as perfect as any economist or statist could desire. In the Salford works about twelve hundred men were employed, comprising pattern-makers, moulders, (iron and brass), smiths, coppersmiths and tinplate workers, engine-fitters, millwrights, electrical mechanics, turners and fitters, brassfinishers, boilermakers, planers, drillers, borers, machine-tool men and labourers. The character of the work turned out during the year of trial was similar to that of the preceding six years, viz. general engineering work, in which are comprised engines, pumping machinery, boiler-work, &c., machinery used in the textile trades (other than spinning and weaving), for the bleaching, printing and finishing of cotton, linen, silk and other fabrics; electrical machinery of every variety for lighting, transmission of power, electric traction, electro-depositing, electro-chemical processes, &c. It will be evident that an experiment with such elements deserves to be considered as convincing. The conclusions are drawn impartially and with precision. The comparison of net value of production with the wages paid is against the experiment, but only to the extent of 0.4 per cent. On the other hand, allowances for wear and tear are in favour of it, and they exactly balance the wages loss, being 0.4 per cent. "Lost time" brings 0.2 to the same side. Piecework does support the diminution of working hours, for the production was reduced as well as the earnings. Mr. MATHER concludes that the wages cost of production in the forty-eight hours system remains the same as it was under the fifty-three hours system, when the new system is credited with the saving in consumables, wear and tear, fuel, &c., which is the direct consequence of the change without diminishing the output of the works. The pieceworkers have lost slightly on the year, but the later months show this loss to be a vanishing quantity. A curious fact is illustrated by the pieceworkers' statistics. The diminution in their total wages means a proportionately less production in actual work turned out by them. But as the total output of the works during the trial year was greater than that of previous years, the diminution in the production of the pieceworkers must have been more than compensated for by extra production on the part of the dayworkers. Mr. MATHER is most eager to have the forty-eight hours' principle generally adopted in this country. He testifies to the persistent industry of the workmen, and he believes that the experiment has improved their home life. Finally, he says, "Of this I am assured, that the most economical production is obtained by employing men only so long as they are at their best. When this stage is passed there is no true economy in their continued work. Our year's trial has

convinced us that we have found the 'happy medium' in the number of hours during which only one meal and one stoppage are needed, and this resolves itself into the eight-hour day or forty-eight hours week."

CAREFUL observations have been taken by Mr. J. W. L. STEBBINS, C.E., in order to ascertain whether two of the tallest buildings in Chicago were affected by the force of one of the late gales, the velocity being at the rate of over 80 miles an hour. The Monadnock building is 182 feet high, and the Pontiac building 175 feet. Both are examples of the employment of steel as a building material, and they might be considered as compound girders placed vertically. It was found that in the Monadnock there was deviation from the perpendicular to the extent of half an inch, while in the Pontiac the utmost was three-sixteenths of an inch. The vibration of the two buildings was therefore of little account on the score of danger, and from the character of the construction it may be assumed that no permanent "set" followed the storm. The Chicago buildings may be unsatisfactory to the æsthetic sense that has been trained to judge by Greek temples, picturesque cottages and the like, but there is no fear about their ability to withstand all the power the American BOREAS can combine.

THE English reports, we imagine, do not contain a case exactly corresponding with one which is before the American Courts. It relates to an architect's certificate, or rather to the absence of one under novel circumstances. The plaintiff is a builder, and he claims 6,158 dols. as balance of a contract. He was not, however, provided with the final certificate of the architect, which by the contract deed was necessary. The statement of claim did not mention that it was unreasonably withheld. On that account, when the case was tried, the judge nonsuited the plaintiff. It so happened that the defendants took the contract out of the hands of the plaintiff and completed the building. This made a change in the character of the action, and plaintiff was advised to raise an appeal on it. The Court of Appeals heard the arguments, and came to the conclusion that the judge in the Court below was in error, and that a new trial must take place. The decision was based on the fact that the defendants having undertaken the completion a final certificate was no longer a necessity. The object of that document was to satisfy an owner that the works agreed for had been duly performed. But when an owner takes up a part of the work it is manifest, without the aid of documentary evidence, that the agreement is not fulfilled. The arrangement to be accomplished, then, becomes simply a balancing of accounts. Both parties have a right to the investigation of claims and deductions. The production of a final certificate no longer becomes a condition precedent, and on that ground the judgment given in the Superior Court of New York was reversed. It will be observed that although the architect ceased to be recognised as arbitrator, not a word was said to diminish the importance of a certificate. Circumstances had drifted the parties into a new relation in which it was no longer indispensable; that is, according to the opinion of an appeal court. As an architect is not supposed to be in a position to grant a final certificate until the works are completed (by English law he cannot assess the value of deductions without special agreement), we cannot understand why the Superior Court should suppose its absence was due only to negligence.

It is a sign of the times when we find the members of the Brighton Debating Society discussing such a subject as the following:—"That, in the opinion of this House, it would be to the best interests of the inhabitants of the town of Brighton if the Corporation carried out all works of public utility and convenience without the intervention of a contractor and by the direct employment of their own workmen, thus insuring a higher standard of efficiency and a saving to the ratepayers in the cost of such works." Of course the resolution was adopted by a large majority, for the contractor is fast losing his friends, not only in Brighton but in most towns. He is supposed to have become a millionaire far too quickly to please the ordinary shopkeeper.



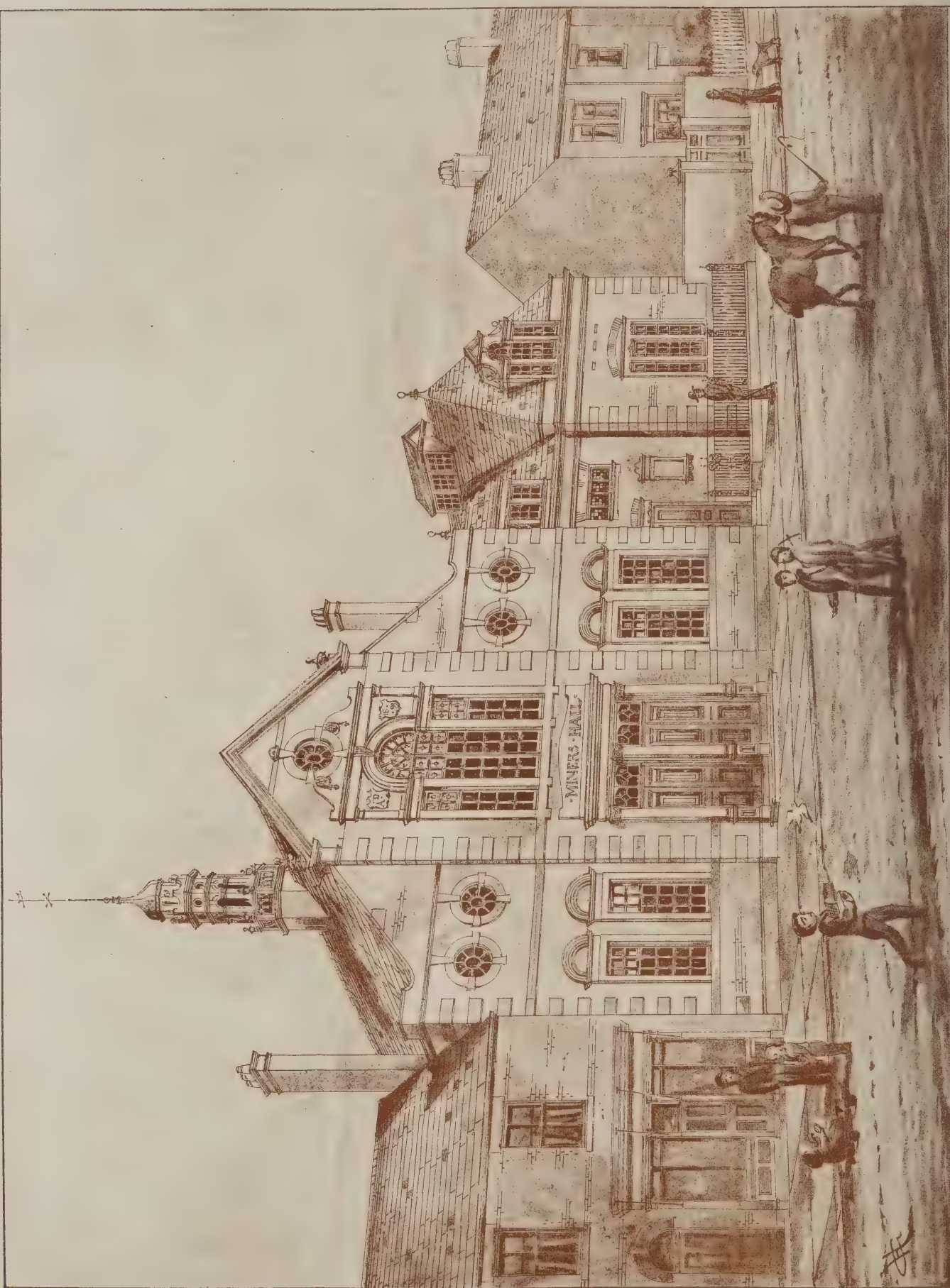
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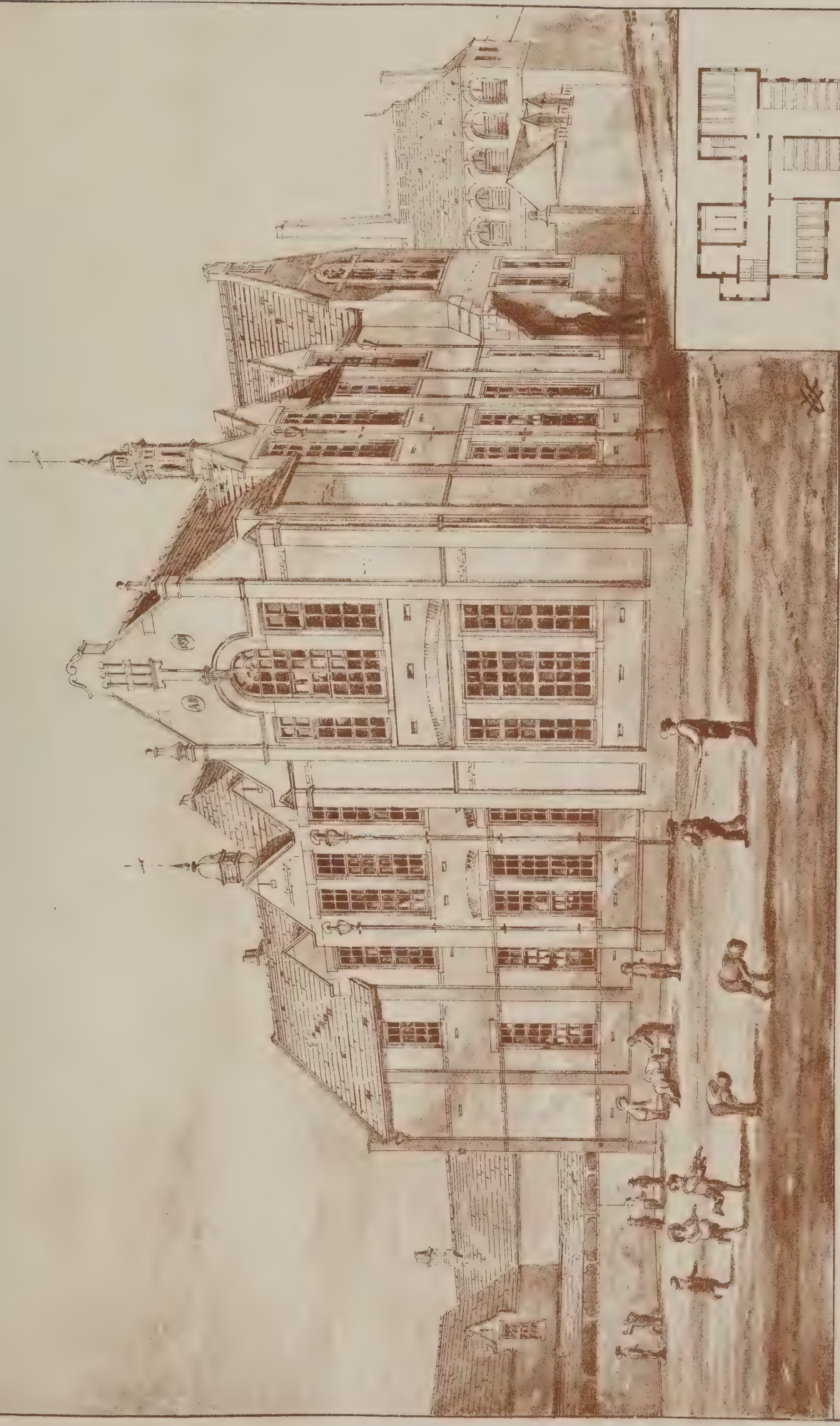


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BRISTOL.
Architect.



• New Miners Hall • Silksworth • HENRY CRIEVES • A.R.I.B.A. • ARCHITECT • S.S. SHIELDS • JANE E.C.



New School for the S. Shields School Board. H. CRIEVES, ARCHT. & B. A. ARCHT.

PLAN.



THE MODEST ROSE ♦ PUTS ♦ FORTH ♦ A ♦ THORN

THE HUMBLED SHEEP ♦ A ♦ THREATENING ♦ HORN



FIGURE FROM ALTAR-PIECE.
CHURCH OF OUR LADY AND ALL SAINTS', STOURBRIDGE.
Painted by L. FAIRFAX MUCKLEY.

ILLUSTRATIONS.

FIGURE FROM ALTAR-PIECE IN THE CHURCH OF OUR LADY AND ALL SAINTS, STOURBRIDGE.

THIS illustration has been reproduced from a large pen-drawing by Mr. LOUIS FAIRFAX-MÜCKLEY, from his altar-piece painted in the above-named church, representing a choir of angels praising the Annunciation lily, the emblem of purity and of the promise of our SAVIOUR'S birth.

It will be evident that the style of the work differs from what is generally adopted in modern church decoration. More character has been imparted to the figures and conventional prettiness is avoided. It is satisfactory to find that some clergy are ready to approve of a treatment which the artist can claim as personal, and which does not compel him to walk in the groove which was supposed to be compulsory on everyone who attempted ecclesiastical art. The experiment by Mr. FAIRFAX-MÜCKLEY is therefore one which demands attentive consideration from everyone who has a care for the future of the highest class of art in England.

TYNTESFIELD, BRISTOL.

NEW MINERS' HALL, SILKSWORTH, NEAR SUNDERLAND.

THIS building contains on the ground floor a large assembly hall, with gallery and recessed platform, also reading-room, committee-rooms and retiring-rooms; on the first floor, billiard and recreation-rooms. The elevations are carried out in red bricks, with stone dressings and carvings. The roofs are covered with Westmoreland green slates. The cost has been about 3,400*l.* The architect is Mr. HENRY GRIEVES, A.R.I.B.A., of South Shields, and the contractor Mr. T. P. SHAFTOE, of Sunderland.

NEW BOARD SCHOOL, SOUTH SHIELDS.

THIS school will give accommodation for 490 scholars, and contains on the ground floor a large school-room, two classrooms, teachers'-room, cloak-rooms, &c., and on the first floor a schoolroom, three classrooms, teachers'-room and cloak-rooms. The two schoolrooms are fitted with sliding partitions, and can each be converted into two classrooms when required. The elevations are of red brick, with stone dressings, &c. The roofs are covered with Welsh slates. The cost will be about 3,500*l.* The building will be heated throughout by hot-water. The architect is Mr. HENRY GRIEVES, A.R.I.B.A., of South Shields, and the contractor, Mr. W. CHRISTIE, of the same town.

PICTURESQUE BUILDING.*

PICTURESQUE buildings appeal to the hearts of all of us, to the everyday Englishman and Englishwoman as much as to the painter and the poet, the architect and the builder, and the subject therefore appeared to me eminently suitable for such a meeting as this, for I do not suppose that this exhibition and these lectures will be attended only by those who are immediately concerned, as part of their daily life, in matters connected with building.

We all have no difficulty in recognising a picturesque building when we see it, but if we are asked why we recognise any particular building as picturesque, and what are the qualities which charm us, it becomes a matter of some difficulty to give a precise and clear definition of what is a picturesque building.

It is not sufficient to say that a picturesque building is one which looks well in a picture. A picturesque building does look well in a picture, but that is only because it is in itself pleasant to look upon, and hence its counterfeit presentment is pleasant to our eyes. Nor is every well-designed and beautiful building of necessity picturesque. Picturesqueness excludes the stately, dignified, majestic building; it is rarely possessed by the mansion or the palace, but is frequently the attribute of the cottage; it is absent from a bank, a warehouse or a cathedral, but is found in the country farm-house and the village church. It always speaks of contented, easy-going home life and happiness, it is foreign to the bustle and worry and striving of business. As you will see from the pictures to be thrown on the screen, picturesqueness is eminently the accompaniment of irregularity, of the unexpected, and never of the monotony of the miles of our London dwellings, the long unlovely length of street upon street of houses all alike, each with its wearisome reiteration of the same bay window, the same street door, the same venetian blinds and the same lace curtains. How much

brighter and happier would be our lives if our speculating builders would only introduce a little more picturesqueness into the houses which the circumstances of our modern life compel us to accept at their hands for our homes, and which implant such love for these homes in our hearts that we change them every three years with the regularity of clock-work. Some few instances there have been in modern times of departures from the stereotyping of pattern, and it pays. Picturesque houses let quicker, and the tenants stay longer, so that there is not the constant repetition of new decorations every three years when the houses change hands.

You will find that costly ornament and carving are quite unnecessary for a picturesque building; instead thereof, good proportion is essential. It matters not what the material of your building may be. Stone, brick and timber, as you will see from the illustrations, have all produced picturesque buildings when rightly used. It is to be noted, however, that for the most part certain materials are used in picturesque buildings in certain parts of the country—stone in the west, brick in the east, timber in various localities. I have not time this evening to go fully into this question, but you may take it from me that the material which is most suitable and most picturesque in any district is the most prevalent local material.

It is this constant use of local material in buildings of past times which does so much to give them that harmony with their surroundings which always marks a picturesque building, and without which no building can be picturesque. Another important item which assists in this harmony, and is indeed its major part, is what we architects call grouping—the arrangement of the parts of a building so that they group pleasantly together.

The examples of picturesque building that I am about to show you are all taken from old buildings of various parts of England, and whilst they undoubtedly owe part of their charm to the softening hand of time, you will observe that the principles I have enunciated are paramount. You will also note that the roofs are ample and of good pitch, whilst the windows, compared with those of our modern villa residences, are small. These are vital points in the effect which any building produces on our mind. As used in old buildings they give that delicious feeling of home comfort which appeals to the heart of all Englishmen. The ample roofs suggest protection and shelter, wide, embracing and all sufficient. The windows, sufficiently large for light, yet lead us to realise that cold and wind are kept out, that snugness is insured, and the home circle kept sacred from the too inquisitive gaze of the casual passer-by. How different is this from the absurdly overgrown windows of the modern villa, whose walls appear to be almost built of glass, each opening stretched to the extreme dimension that the law allows. And to what purpose and with what result? The picturesqueness, the beauty of our homes is ruined, the coal bills enormously swelled to overcome the chilling of our rooms by the immense glass surface. It is not for the sake of the light that we have these great yawning chasms in our walls, for we immediately proceed, or our wives do for us, to cover up the greater part with venetian blinds and lace curtains, with their increase of the washing bill. Thus we have all the inconvenience, all the discomfort and all the expense of our big windows, but we do not, indeed we could not, enjoy the advantage of the increased light, which is their ostensible excuse.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE members of the Edinburgh Association visited Sciennes School on Saturday. Mr. Wilson, the architect of the school, stated that the classrooms and lecture-rooms were designed to accommodate 1,686 children, allowing 10 square feet for juveniles and 8 square feet for infants. If the area of the gymnasium and swimming-bath were added the accommodation would be 1,990. The site extended to 1¼ acre, and had been acquired for 5,676*l.* 18*s.* 6*d.*, which sum included the expenses of purchase. The total cost of the school, including fittings, offices, playsheds, janitor's house, &c., was 21,874*l.*, or barely 11*l.* per child, basing calculations on the full accommodation of 1,990. After Mr. Wilson had explained from a diagram the arrangements of the school, and had described the system of mechanical ventilation, a tour of inspection was made, and the uses of the various classrooms pointed out, and the peculiarity of their furniture to suit requirements was noted. The visitors were much interested in viewing the gymnasium, swimming-bath, laboratories, and especially so in the carpenter's workshop, where Mr. Graham, the instructor in joinery, explained the methods of teaching and exhibited some very creditable work which had been executed by the scholars. Mr. Murray, the headmaster, then detailed the system of instruction adopted throughout the school and indicated the working arrangements. Mr. W. W. Robertson, the president of the Architectural Association, then proposed a vote of thanks to Mr. Wilson, Mr. Murray and Mr. Graham for their attendance and for the information imparted, which rendered the visit instructive as well as interesting.

* A lecture delivered by Mr. F. R. Farrow at the National Building Trades Exhibition on March 21.

THE EXCAVATION OF DEIR EL BAHARI.

EVERY Nile tourist, says a correspondent of the *Times*, knows Deir el Bahari. The "personally conducted" find it in their first day's programme at Thebes, and are required to assimilate it as best they may with a dozen tombs of the kings and two temples. Independent tourists make it the goal of a day's expedition and bring their luncheon. The jumble of walls that they have seen from a distance, clinging to the foot of a horseshoe cliff, resolves itself into an ordered series of terraces, rivalling in the freshness of their painted sculptures the best of the royal tombs, and in delicacy of relief-work any graven wall in Egypt. On these terraces Queen Hatasu raised, about 1550 B.C., a unique monument to the memory and worship of her father, Thothmes I., and somewhat to her own honour and glory, for she takes occasion to record there her own most brilliant achievements, notably the bringing of all manner of precious things from the land of Punt—Somali land, at the mouth of the Red Sea. Those wall-pictures are the most delightful among remaining historical representations in Egypt. The queen's admiral arrives at a land of marsh-dwellings and is greeted by the savage king and queen. Behind him his fleet makes the shore; the elaborate rigging of the ships already arrived and the bellying sails of those still distant form one of the happiest wall-decorations in the world. In a higher panel the ships put off again, laden with all manner of precious things, while dog-faced apes clamber and squat on the yards. In the third and highest belt of relief we see the envoys of Punt, arrived before the queen, and a long procession of their gifts—rare trees borne in tubs slung on poles, wild beasts, apes, giraffes, leopards and lions led in chains, ivory, ebony, gold and spice. The treasure is told and weighed, and finally the queen devotes it in due form to Amen-Ra, of Thebes. The sovereigns of Egypt will never live again for us in the same sense as the great of old Greece and Rome; their history we cannot write; their fragmentary annals are contained only in those most mendacious of all sources—official inscriptions. It is idle to deal with motives and minds before the birth of literature; but we may note nevertheless that the long procession of august outlines that stalk across the pylons and tomb and temple walls of Egypt is broken here and there by figures sculpted more in the round. Hebrew tradition has, of course, done much for a certain Pharaoh; Greek legend something for the pyramid-builders and the great Rameses. A kind of life has been breathed of late into the dried corpse of Amenophis IV., the idealist "worshipper of the sun-disk" at Tel-el-Amarna; and certainly about this Queen Hatasu of the eighteenth dynasty there still hangs some humanity, in spite of the three millennia and a half that divide her from our time. She overcomes by personal force the prejudices of a changeless people, and alone in the great historical period breaks the male line. The artistic brilliance of her reign seems due to her own policy of eclipsing the military brilliance of a king. By one means or another she keeps her throne, and only after many years can her mighty nephew, Thothmes III., wreak vengeance on her monuments. We know, in short, just a little more about her as a person than about almost any other sovereign of Egypt, and that precious little; and the supreme artistic merit of her work give to her temple at Deir el Bahari and its present exploration their especial interest.

Built for the worship of a dead man, like all the great fanes on the left bank of the Nile at Thebes, the temple at Deir el Bahari has no progressive national character. Successive dynasties have not altered nor enlarged it; it remains an expression of a single period, the zenith of Egyptian greatness. Its history as a building is comprised in the additions that the queen herself made to her own plans and the mutilation of her names and titles by order of her vengeful nephew; the heretic Amenophis hacked out here, as everywhere, the figures and names of Amen-Ra; here, as everywhere, the inevitable Rameses II. restored them in a style unworthy of the first hand. In neglectful times the mountain was allowed to slip and break in roofs and fill up courts. A Coptic convent, built over part of the highest terrace, added its rubbish to the mounds formed already over the lower levels. Hardly a third of the whole temple was visible two years ago, and the rest seemed doomed to lie for ever under 40 feet of earth and stones.

The Egypt Exploration Fund, however, came to the rescue in the early part of last year, and with two hundred men and a Decauville tramway succeeded in clearing the greater part of the highest terrace before the hot season began. The finds made in the process were as remarkable as unexpected. The buried north end, instead of being symmetrical with the south, as Mariette had supposed, upheld the general character of Egyptian buildings by being utterly unsymmetrical and abnormal. To balance the small "chambers of offerings" on the south there was found on the north a large hall, in the inner part of which rose a high altar dedicated to Harmachis by the queen. The displaced stones have been built in again now, and the great platform of brilliant white limestone, with its

frieze of hieroglyphics and its graduated ascent, stands almost as complete as it ever did, the only such altar extant in all Egypt. Beside it a little funerary chapel runs into the rock, its walls a marvel of brilliant colouring. During the present season operations have been carried on with a larger staff, including two artists to reproduce the sculptures for publication. Two hundred and fifty men have been set to work on the great mounds under which the northern half of the central terrace was buried, and bit by bit they are being carried away in the Decauville cars to a deep pit a quarter of a mile away. Pillar by pillar the graceful colonnade which ran round the north side and north-west corner of the terrace is emerging from the earth. Until this year not one person in a hundred who visited Deir el Bahari knew that it existed, and still fewer suspected that it ended in one of the finest painted halls in Egypt, soon to be opened to light and air.

It is always interesting to watch an excavation in Egypt at any stage of its progress, for so many treasures of so many kinds lie everywhere in the preserving sands. Here, at Deir el Bahari, the diggers, drawn from Theban villages, have been tomb-robbers to a man, and have lynx eyes for small antiquities. Pecking away at the lower layers of the mounds, they let hardly a minute pass without picking up scarabs, amulets, beads, or bits of that wonderful blue-glazed ware which ranks among the finest products of the ancient world. Here a fragment of potsherd, inscribed with Coptic writing, slides down the earth slope; there rolls a limestone chip covered with Demotic characters. These are the archives and, it seems, also the library-catalogue of the monastery built here in the early days of Christianity. Now and then a refuse-heap is reached, and bits of papyrus, Greek, Demotic and Coptic, are taken out in handfuls, together with broken objects of every sort and kind and many precious fragments of sculptured walls. Perhaps the patient fellaheen pilfer a little; men who habitually use their mouths as purses can easily hide a scarab or a charm. The Luxor tourists are ready to give so many times their real value for these little objects that the archaeologist cannot afford to bid against dealers who purvey for such a market. But much can be done by watchfulness—more perhaps by indirect play on the hopes and fears of the fellaheen, who is by nature honest, if weak in the face of prolonged temptation and opportunity. The question of honesty apart, he is at any rate as good a workman as could be found anywhere for such work as scientific excavation. He is watchful, careful and light-handed; he needs little driving, for he has not that cunning given to the Greek to enable him to shirk, and he amuses himself vastly by one means or another while he works, singing, joking and teasing. He is best left to dig after his own fashion with a feeble hoe, for it is no bad means to the end in view. Pickaxe and spade would break where the *turi* does no harm, and if he can be kept to his level cutting, and a mole-like propensity for burrowing (which betrays the habit of tomb-digging) checked, he will clear away for *5d.* a vast amount of packed earth in a day, and withal find the antiquities it contained. These bowed bronze figures, however, that stoop forward in a rising mist of dust, are not the only agents which science employs. Behind them are twice as many boy basket bearers, unconsciously graceful as youths on a Greek frieze. Here a full car is being pushed groaning down the line by four adult children delighted with their rolling toy; there an empty one is coming back at a run, and will probably be run off the rails presently by its excited drivers. At some little distance a sculptured wall is being rebuilt by native masons, who dispense with scaffolding and squat sparrow like on the topmost course, in that attitude moving heavy stones with perfect ease. Every one is singing some one of the old choruses that every Arab knows, a line or two improvised here and there by the fogleman about the stone, or the mummies, or the steamers on the distant Nile, or anything that strikes his eye or fancy for the moment. Towards sunset the chorus grows louder, all eyes meet on the master's lips; and one syllable of the word of dismissal is hardly framed before men and boys are off, sliding down the earth-shoots, jumping over stones, shouting as though bound for something better than onions and bread and labour again at sunrise to-morrow.

The hot season and the fast month, Ramadan, break off the work in the middle of March. By then the mounds on the central terrace will have disappeared, and the sculptured west wall, the pillared hall with its funeral scenes, and the colonnade will be visible again, as they have not been for many centuries. In December next another season will open, the lesser accumulations on the southern side of the temple be attacked, and the costly rebuilding operations continued on the upper terrace. If the present undertaking can be carried through the Egypt Exploration Fund will have the credit of promoting a unique monument to the select first rank of the spectacles of Egypt, and its publication of the reliefs and paintings, as well as all the minor treasures found and to be found, will be more complete and not less artistic than the magnificent volumes which French munificence has produced.

ARCHITECT'S PLANS IN CAPE COLONY.

IN the Supreme Court, Cape Town, before the full bench on the 21st ult., the case of *De Witt v. Cape Canning Company* was heard. Mr. Schreiner, with whom was Mr. Watermeyer, appeared for plaintiff, and Mr. Searle, with whom was Mr. Jones, for defendants. The *Cape Argus* gives the following report:—

This was an action brought by Mr. A. M. de Witt, architect, of Cape Town, against Mr. H. Batezat, in his capacity as secretary of the Cape Canning Company, to recover the sum of 77*l.* 8*s.* as remuneration for work and labour performed on behalf of the company by the plaintiff, at the special instance and request of Mr. Strasburger, the manager of the company, by preparing plans and specifications of a factory and cottage which it was proposed by the company to erect in the Dock Road. In October last Mr. Strasburger called upon plaintiff and asked him to prepare plans and specifications of the proposed factory and cottage. The plaintiff accepted the appointment, and the work was completed about the close of the month. Advertisements were inserted in the newspapers for tenders for the work on the basis of the plaintiff's plans and specifications. About November 8 the plaintiff was notified that his plans had been accepted, and that the work was to be proceeded with. His account was 77*l.* 8*s.*, which was 2½ per cent. on the tender of Dixon. The defendants repudiated all responsibility, and the issue before the Court was simply this:—The defendants contended that the plaintiff undertook to prepare the plans knowing that he was competing with other architects, and knowing also that he would not be entitled to any remuneration unless his plans were accepted. The plaintiff wholly denied anything of the kind, and had never entered into competition with other architects.

Mr. A. M. de Witt deposed that he had been practising as an architect in Cape Town since 1879, and was architect for the Lobster Factory at Woodstock. About October 13 last Mr. Strasburger, manager of the Cape Canning Company, called upon him and said he wanted him to draw up plans for a fish canning factory, which was about to be started by some Cape Town merchants. In company with Strasburger he visited the site of the proposed factory, at the foot of Bree Street. Strasburger gave him the dimensions of the various rooms, and he took down the particulars in his pocket-book. There was to be a factory and a cottage for the manager. During the interview Strasburger informed him that plans had been prepared by Messrs. Stent and Ransome, and also that Mr. Freeman had been communicated with. He told witness that the plans of Messrs. Stent & Ransome had not been approved of, and that they had sent in amended plans, but these were also rejected. Strasburger said that he supposed, as Freeman had not sent in any plans, he did not care about the job. He never intimated to witness in any way that he was supposed to be competing with any other architect. He had never done that sort of thing, but he might have accepted on those terms. He returned to his office, and with the assistance of his clerk, Mr. Perkins, set about drawing up the plans. A day or two afterwards, while making the sketch, it struck him that some improvement could be effected, and he called at the office where he found Mr. Batezat. The improvement he suggested was that rails should be placed on the floors for the trolleys to run on. Batezat said he knew nothing about this, witness had better consult Strasburger. During this interview Batezat showed him the plans sent in by Stent & Ransome, and also showed him some letters written by them as to the probable cost of erecting the factory. Batezat and Strasburger frequently visited his office, making suggestions and giving instructions. On October 23 he wrote a letter covering the plans, draughts and specifications. He estimated that the cost of the factory would be about 3,000*l.*, and that of the cottage 700*l.*, and that under favourable conditions the buildings could be completed in three and a half months. A couple of days afterwards Batezat, accompanied by Herbert, one of the shareholders, called upon him, bringing back the plans and specifications. They said that the matter had been laid before the Board, and that the cost of the factory had been approved of, but that the cost of the cottage must be reduced to about 500*l.* Witness said that if the dimensions of the cottage were reduced the work might be carried out for that sum. On October 30 he sent in an amended plan, and also prepared bills of quantities on the special instructions of Strasburger. He had some conversation with Batezat and Strasburger about the roof, and said that an iron roof could be obtained from England. He communicated with Mr. Cranmer, his agent in London, as to the cost, and received a reply by cable that he would deliver the roof on the spot for the sum of 1,000*l.* On October 31 an advertisement appeared in the *Cape Argus*, signed by the secretary to the defendant company, inviting tenders for the erection of a factory and buildings in the Dock Road, to be sent in by noon of Saturday, November 4, and stating that the plans and specifications could be seen at the office of the company, Selwyn Chambers, St. George's Street. Strasburger brought him the paper and asked him if the advertisement was properly drawn, and he said no.

He drew up another, which was inserted in the *Argus* on the following day. Tenderers came to his office, and he gave them bills of quantities. On November 4 he called at the office of the company, and asked Batezat who was the successful tenderer. Batezat read out those which had come to hand, and said that two more were to come in, and that time was extended until the following Monday. He asked witness if Dixon was a good man to employ, and witness expressed a favourable opinion. On the Monday witness went to the company's office and met Strasburger there; he wanted to know if wood would be cheaper than iron for the roof. His reply was that probably wood would be 100*l.* cheaper. Batezat and Strasburger said they were going to a meeting of the shareholders, and witness proposed to accompany them, but they did not desire him to do so, stating that if he was allowed to be present Ransome and Freeman would also claim to be there, as they also had sent in plans. This was the first he heard about these plans. In the afternoon he met the Hon. Mr. Graaff, one of the directors, who asked him if Dixon was a good man, and he said yes, at the same time pointing to several buildings which had been erected by him. On October 18 he inquired if his plans had been accepted, and the reply was that his plans had been submitted to the meeting with those of Ransome and Freeman, and it was decided to accept the plans of the last-named architect. On the same day his plans and other documents were returned to him. On the following day he returned the plans to the company, accompanied by a demand for payment, basing his claim on the amount of Dixon's tender. To this a reply came to the effect that witness had agreed to enter into competition with other architects, and that as his plans were deemed unsuitable he could not expect any remuneration and his account was returned. On November 16, Messrs. Van Zyl & Buissonne wrote to the defendants, denying the statement that their client entered into any competition, and intimating that if the account was not settled by the 18th legal proceedings would be instituted. Witness had inspected Freeman's plans; they were not copies of his, but on the same lines.

Cross-examined: He was aware that the plans would have to be submitted to the meeting of shareholders. He considered that if he was asked to send in plans he was entitled to payment whether they were accepted or not. Strasburger said nothing to him about other plans being sent in, or that the shareholders would have to decide on the rejection or otherwise of the plans. These competitions between architects were unusual. He was aware that the Claremont municipality was calling for plans by competition, but that was a public matter; but if architects were privately asked to send in plans they were entitled to some recompense. He sent in amended plans because the cost of the erection of the cottage was considered too much.

Mr. W. T. C. Perkins deposed that he was a clerk in the employ of the plaintiff, and had been engaged in preparing the plans connected with the present action. He was present on various occasions when Batezat and Strasburger came to the office, and gave instructions in detail as to how the plans were to be carried out.

Mr. A. J. Dixon, builder and contractor, deposed that he saw the advertisement calling for tenders for the erection of the canning factory, and called at the company's office for information. He saw no plans there except those of the plaintiff. He saw Batezat, who gave him all required information, and told him if he wanted more he must go and see the plaintiff. He said nothing whatever about any other architects. He saw Batezat on November 6, when he told him that his tender was the lowest, and that he stood as good a chance as anyone else of being the lucky man.

Messrs. C. Williams, J. Starck, R. Mitchell, H. J. Hunter and G. Clark, all builders and contractors, gave somewhat similar evidence.

Mr. J. Parker deposed that he was an architect. He considered that 2½ per cent. on the amount of Dixon's tender was a fair and reasonable charge. If plans were not approved of, the architect was entirely at the mercy of his client. In England approval would be the test of recovery. He had always received money, even when his plans had not been approved.

Cross-examined: If tenders were called for he would consider that the plans had been approved of. He had gone in for competitions among architects. In many cases architects spent months in drawing plans for large buildings, and got nothing if their plans were not accepted.

Mr. G. Ransome deposed that he was invited to send in plans, and knew that he was taking part in a competition. The names of Messrs. Stent and Freeman were mentioned as competitors, but the name of the plaintiff was not mentioned. He considered that 2½ per cent. was a fair and reasonable charge, provided the plans were accepted. He got nothing for drawing his plans. If tenders were called for he would look upon that as an acceptance of the plans.

Cross-examined: If the plans of an architect were accepted, the usual form of the advertisement disclosed his name and

stated that all information could be obtained from him. He made no claim on the defendants; he took the chance of being successful.

For the defence was called Mr. H. Batezat, who deposed that he was secretary of the defendant company, which was formed in September last. On October 24 a meeting of the shareholders was held to consider the plans sent in by Ransome, Stent, Freeman and the plaintiff. He told the plaintiff that there were other people preparing plans, and that no favour would be shown to anybody; he also informed him that all plans would have to be submitted to the meeting. The plaintiff acquiesced, and said that as he had already dealt with the Woodstock Factory he could do as well, if not better, with this building. One afternoon the plaintiff came to his office and asked for Strasburger, who was not in. Ransome's plans were lying on the desk, and the plaintiff requested, and was allowed, to inspect them. He said, "Isn't it a shame? He has actually copied the designs of my factory at Woodstock." Witness replied that Strasburger had called upon all the architects to furnish plans, and some of them must be pretty similar. After the meeting of October 24 he called for tenders, in accordance with instructions from the shareholders. On the day of the meeting he saw the plaintiff, who said he would be present. Witness replied, "If you are to be present, then Freeman and Ransome must also be there. You know very well that they have sent in plans." When the plans were submitted to the meeting, those of Freeman were accepted. He considered it to be a huge joke on the part of the plaintiff when he said that he was not aware that there was a competition.

Mr. C. Freeman deposed that he was one of those who sent in plans. If his plans had not been accepted he would not have made any claim on the company. The charge of $2\frac{1}{2}$ per cent. was a fair and reasonable one if the plans were accepted. If the work was not commenced the plans were very rarely charged for.

Mr. Searle said he had no further evidence to offer in the absence of Mr. Strasburger, whose departure from England had been delayed until March 3.

The Court directed that the further hearing of the case should stand over until April 13 next.

LOADS ON FLOORS OF AMERICAN OFFICES.

THE following explanation of the calculations adopted for the loads in the high office buildings of Chicago has been contributed to the *American Architect* by Mr. W. L. B. Jenney, architect:—

In calculating the steel-skeleton construction for an office-building, it is our aim to provide for all the dead-load and for the maximum actual live-load that will obtain. This last can only be reached by actual estimates. The observations of Mr. Emperger would seem to be theoretical. An examination in the building, we believe, will demonstrate there in New York, as well as here, that the live-load provided for, of 70 lbs. per square foot, does not obtain in any office in the building, and this extreme figure is used because of the possibility of an office being used for a gathering or meeting of as many as could even find comfortable standing-room, or a rush into a room or rooms, due to some special momentary attraction, and particularly in Chicago to satisfy the Building Ordinance. In such cases it would be best that a beam could be loaded temporarily its whole length with the maximum load of 70 lbs. per square foot, but that the girders should have the full maximum load necessitates that at the same time two or more beams assembled to the girder on each side should be all loaded with this maximum load at one and the same time, which cannot be reasonably presumed, hence the reduction of the live-load of, say, 10 or 20 per cent.

In regard to the columns. The only columns in the building that we can reasonably presume will ever carry the maximum load are the attic columns supporting the roof, which may be loaded exceptionally with a live-load of say 40 lbs. per square foot on the roof, consisting of snow and ice. This we deem sufficient even in Chicago, because these important buildings are in charge of a custodian under whom is a head janitor and chief engineer. In case snow-storms follow each other without much diminution of former falls of snow or frozen rain, it will be removed by the force whose duty it is to watch for such conditions, so that 40 lbs. is deemed to be sufficient. None of the offices are ever loaded to the calculated capacity of 70 lbs. per square foot.

Messrs. Blackall and Everett made numerous estimates of the actual live-loads in office buildings. Live-loads were found to range from a maximum in one single instance of about 40 lbs. to a minimum in several instances of 5 lbs. A live-load of 20 lbs. per square foot on each floor would exceed the average. An estimate made by the George A. Fuller Company, the leading building contractors of Chicago, gave but 6 lbs. per square foot with the office comfortably full, with 9 lbs. as an extreme maximum.

In offices and in hotel buildings so much space is taken up by light, though bulky, furniture that the live-loads are very low. In well-appointed fireproof buildings there are vaults which form a part of the dead-load in every suite of offices, so that there are few or no safes. The heaviest load is generally found in the lawyers' offices, consisting of books. Even in theatres Mr. Blackall quotes the heaviest load obtainable as but 58 lbs., so that the 70 lbs. per square foot which is used in calculating the beams in our office buildings is forced upon us by the Ordinance, and is fully 20 per cent. above what we would be justified in using. The foregoing, we believe, is a full justification of our methods of calculation.

In warehouses actual estimates must be made of the loads they are intended to carry. It should neither be too light nor too heavy, for if too heavy it leads to an unnecessary expenditure, hence a waste. In warehouses the loads are distributed in the same manner as in office buildings—full live-loads on beams, for they may receive it, but as there must be passage-ways to allow for the moving of goods the girders will only receive 80 or 90 per cent, according to the class of business.

There is a very good section in the Chicago Building Ordinance, that has been recommended by the writer for some years, requiring that there be displayed conspicuously on each floor of warehouses a placard stating the load per square foot of floor surface which may be safely applied to that particular floor, or in each particular locality should there be a variation.

The writer had occasion to estimate the actual loads carried in the dry-goods warehouses of Marshall Field & Co., in Chicago. The maximum load over limited areas was 57 lbs. per square foot, with passage-ways between for the trucks moving boxes of goods, so that the maximum average was less than 50 lbs.

The more storeys there are above any given column the greater will be the diminution of the live-load, hence, the reduction of live-load from the roof columns to the basement is justified by the facts.

With regard to the tile arches forming floors, experience has taught us that, all things considered, the most advantageous span between beams is about 6 feet. The longer the span the deeper the beams, hence the greater loss in clear heights of storeys, a matter of importance in Chicago, as the height of fireproof buildings is now limited by law to 130 feet from sidewalk to highest part of the roof. These hollow-tile floor-arches are laid in a strong Portland-cement mortar—one of cement to three of sand. The joints are entirely filled. To be assured of this, a special superintendent is put at the building. The tile are all inspected on their arrival at the building and any soft or imperfect tiles are discarded and immediately removed from the premises. Numerous tests of these floors have shown them to be in every respect satisfactory. A roller 6 feet in diameter with 16-inch face, weighing about 1,800 lbs., I have seen rolled over these arches before they were concreted. Obstacles such as brick, 2 inches by 4 inches scantling, &c., were placed before the roller and it was made to jump over them without the slightest effect on the arches. In one instance while we were making these tests a 12-inch I-beam, some 8 feet in length, fell three storeys, destroying a floor-beam in its fall by buckling the web, and struck on end on the top of the floor-arches beneath. It punched a hole through the top flange and fell over on its side, without otherwise disturbing the tile or injuring the soffit of the arch.

I note that Mr. Emperger speaks of the elastic limit of some steel at being below 30,000 lbs. per square inch. Such steel is not used in Chicago for constructional purposes, other than for rivets. Our specifications are those published by the Carnegie Steel Company in their "Pocket Companion," the edition of 1893, edited by Kindl, which calls for an ultimate of 60,000 to 68,000 lbs. per square inch, with an elastic limit of one-half of the ultimate. An examination of the test-sheets for the New York Life Building shows an elastic limit ranging from a minimum of 34,190 to a maximum of 38,380; the ultimate ranging from 61,190 to 67,850 lbs. per square inch. As we have a fibre stress of 16,000 we have a coefficient of safety of four.

Careful calculations are made for wind-pressure at 40 lbs. a square foot, and methods are provided to resist this pressure without exceeding the safety coefficient. Should a cyclone run the pressure higher, it would be but for a short time. As yet none of the steel skeleton constructions in Chicago have been in the slightest degree injured by the wind, although a cyclone about a year ago struck the Home Insurance Building, blowing some lights of plate-glass out of the sash.

These tall skeleton buildings, as they have been erected by the most experienced architects in Chicago, are designed and calculated with all the science, inspected and superintended with all the care and attention that is given to a railroad bridge of the first order, and we believe them to be fireproof, cyclone-proof and earthquake-proof. Certainly they have never shown the slightest signs of weakness under the severest tests to which they have been subjected.

CAERLEON AND ITS MUSEUM.

LIKE the Corinium Museum at Cirencester, this Monmouthshire museum, writes Mr. J. Ward, M.A., in the *Antiquary*, is exclusively antiquarian and essentially local. Most of its contents were found at different times in and immediately around the town, while a few relate to neighbouring villages, particularly Caerweni, about eight miles away. The residue came from more distant places, as London, York, Italy and Egypt; these, however, are treated as an illustrative series, precisely as in a similar class at Cirencester. For the above reason the collection cannot properly be studied apart from the locality, nor the locality from the collection—the one illustrates the other. Both, therefore, will be treated as equally essential to the present sketch.

When first I saw this ancient place, nearly two years ago, I was keenly disappointed. One is apt to presume that past importance is always linked with present vestiges of that importance. Think of Rome; it brings to mind ruined temples and aqueducts, early Christian churches and Mediæval palaces. How full of mementos of the past are York, Chester and Gloucester. But Caerleon, the capital of Britannia Secunda, the headquarters of one of the chief legions of the empire, an ancient archiepiscopal see and centre of learning, and the subject of many a Mediæval tradition and romance, surely of all places should be venerable with visible antiquity. But no; a passing stranger—even a lover of the past—might easily fail to discern in its narrow lanes, winding in a most un-Roman fashion, anything of more interest than is to be seen in most old-fashioned English village-towns. The huge mound or *burh* of the castle, on which probably stood “the prodigious high tower” of Gerald, the fine old, but over-much restored, Perpendicular church, with remnants of an early Norman structure, and some excellent examples of Tudor Domestic architecture, would undoubtedly attract his attention; but he would see in them only a proof of the post-Roman and Mediæval importance of Caerleon. Give him, however, but an inkling of the presence of Roman remains, and if his antiquarian perception is worth anything at all, he will not fail to trace the parallelogram of the castra from existing vestiges of the earth-mound and its masonry facing, nor to note the circular *cavea* of the amphitheatre, known popularly as King Arthur's Round Table. Were it not for the watchful interest of the Monmouthshire and Caerleon Antiquarian Association, these would probably now be the only visible remains of the Roman city. The numerous objects found year by year would either have received no notice or care at all, or, remaining in private hands, have gravitated to distant museums. But during the past forty or fifty years the little museum established here by this Association has been a successful means of gathering together and preserving finds. And now its varied contents, coupled with the remains *in situ* and the numerous records of past discoveries and investigations, furnish a by no means despicable knowledge of this important military centre of Roman Britain.

Historically, Roman Caerleon, Isca (the Latinised form of the river name, Usk) Silurum (to distinguish it from Damnonian), is little more than a blank. We may reasonably conclude that its importance to the Romans was an immediate consequence of the defeat of Caractacus, chief prince of Essyllwg, the land of the Silures. These hardy hillsmen, however, were never thoroughly subjugated, and their conquerors, like the Normans of a later age, erected a chain of strongholds to protect the fair lowlands of Gwent and Glamorgan from their attacks. These fortified stations were threaded by a great military road, the Via Juliana, stretching from Gloucester to St. David's Head, and the chief of these stations was Caerleon, the City of Legions. For a long period—probably two centuries—it was the headquarters of the Second Augustan Legion, and thus it played a part in respect to South Wales comparable with that of Chester, the headquarters of the Twentieth Legion, to North Wales. It is equally reasonable to believe—in fact, the existing vestiges clearly prove it—that as a legionary station it was a place of considerable splendour, however much we may feel inclined to discount Gerald's description. That we must take the words of this writer *cum grano salis* is proved by Henry of Huntingdon's statement of half a century earlier, which explicitly makes the walls so ruined as scarcely to be seen.

This contradiction will make us cautious with the statements of another old literary worthy, Geoffrey of Monmouth, who would have us to believe that Caerleon was founded by none less than the mythic Belenus, the conqueror of many nations and counterpart of the classic Apollo. From the same and other sources we learn that it was one of the three greatest cities of Britain, the capital of Essyllwg, and the birthplace of King Lucius. We tread on firmer ground in post-Roman times. This city was intimately connected with King Arthur, being the place where he is said to have been crowned and held his court. It is also the ecclesiastical mother of St. David's, whither the see was removed in the eleventh century.

Caerleon suffered much from the hands of the Saxons and the Danes, being several times burnt down to the ground; it

remained sufficiently important in even late Mediæval times to be incorporated. Its apparent destiny is to become an outlying suburb of the neighbouring progressive and rapidly-growing town of Newport, once the port of Caerlon.

The museum, which is so intimately connected with this most interesting place, occupies a conspicuous position near the church. It has the outward form of a miniature Classic temple, with internal dimensions of about 40 by 20 feet. Four Grecian Doric columns support a plain pediment, and behind them is the doorway, the only aperture of the walls, the interior being lighted from the roof. It is not a cheerful structure. These reproductions of Classic art in dull grey stone, and with our murky surroundings, are but parodies of the white marbles and the sunshine and pure blue skies of the Levant. The interior, however, has a good and even light, and thus so far is suitable for its purpose. The general construction distinctly recalls the atrium of a Roman house. The oblong central skylight would be a compluvium were it unglazed. The corresponding opening in the floor lacks water to make it an impluvium; it admits an uneven light into a dismal basement, or, nearer the truth, cellar.

There is no popular guide to the collection, and apparently no attempt is made to enlist the interest of the “common people.” I sounded several of the villagers as to their views on the museum. Let one suffice. She had once paid it a visit, but did not know what to make of the things. “They might be,” she assured me, “curiosities, but they ain't pretty.”

The impression the interior gives rise to is that the collection was once cared for, but has since been left to look after itself. The objects, as a rule, are accompanied by descriptive labels, but they are in a faded and dirty condition. There is a perceptible dampness pervading the room, which must be harmful to the exhibits; and to accentuate the “down-grade” appearance, the roof shows such ominous sign of collapse as to have recently necessitated a small forest of timbers to prop it up. In these respects this museum is a contrast to that of Cirencester, although so like it in others. Let it not be thought, however, that the scientific interests of the collection have been neglected.

During the forty-six years that the Association has been in existence it has published at irregular intervals various monographs and other works, and in these may be found described and illustrated nearly all the objects in the museum. The larger portion by far find a place in “Isca Silurum,” a careful and exhaustive royal 8vo catalogue, with 52 excellent lithographic plates. The author, the late Mr. John Edward Lee, F.S.A., a resident of the place, was long honorary secretary of the Association, and one of its most active promoters. This book was published in 1862, and is to a great extent a second edition of “Delineations of Roman Antiquities at Caerleon,” a work out of print at that date. In 1868 Mr. Lee published a supplement, dealing with subsequent additions to the collection. Since then nothing further has been done in this direction; but the few additions of late years have been noticed in ordinary publications of the Association.

VICTORIAN INSTITUTE OF ARCHITECTS.

THE annual report of the Council of the Royal Victorian Institute of Architects states that during the six months which have elapsed since their election the Council have held sixteen meetings. The stagnation in general business has been reflected in their proceedings, the greater portion of which have been necessarily devoted to the consideration of financial matters. Active steps have been taken to give effect to the articles of association in regard to obtaining payment of arrears of subscriptions. It is a matter for great regret that many members have found themselves completely unable to pay, and that in spite of the pressure exerted by the Council a substantial sum is still in arrears. The Council strongly sympathise with those individual members who are unavoidably prevented from paying, but in justice to the whole body of members they are compelled to insure, so far as is in their power, that all pay whatever their means admit. A proposal for affording a measure of relief to members, and at the same time for obtaining the earlier payment of current subscriptions, has been adopted by the Council.

One examination has been held during this term, but the candidates have been afforded by the examiner, with the sanction of the Council, a further opportunity of testing their proficiency.

The joint tenancy of the premises, just commenced at the time of the last annual meeting, has worked very satisfactorily so far. It is to be noted in this connection that a very sufficient test has proved that the necessity for keeping the reading-room constantly open up to 10 o'clock P.M. is not so great as was at first believed. The expense involved in doing this is therefore incurred no longer.

Certain alterations in the articles of association are thought ripe for discussion. The Council desire to record their best

thanks to those members who, either in committee, or as examiners, or as filling any other office, have supported them and carried out in detail the varied work of the Institute. They also thank the gentlemen who have contributed papers or addresses at general or sectional meetings, those to whose good offices are owing the opportunity of the various interesting visits which have been paid by members, and those bodies or individuals who have contributed to the library; and not least the press, for full and careful reports of the proceedings. During the time that has elapsed since the last annual meeting, the Institute has co-operated with other bodies in forming, under the auspices of the Chamber of Commerce, the "tribunal of voluntary arbitration" which has been officially inaugurated, though this method of adjusting differences has long been an essential part of the procedure in building operations, and is provided for with special care by the Institute.

The vigorous but necessary action taken, and to be taken, in regard to arrears of subscription will of course have the effect of procuring the retirement of those who can no longer afford the annual payment. A reduction in membership on this account may be looked for, and the Council would urge upon members the need for loyal and concerted activity in the interests of the profession through the medium of the Institute.

The social and literary committee report that since the holding of the last annual meeting the following visits have been arranged and successfully conducted:—To Messrs. J. Danks's Foundry, South Melbourne; the City of Melbourne Desiccator Works, at North Melbourne. During the last session four ordinary and three sectional meetings were held, at which the following valuable papers were read:—"The Melbourne Sewage Scheme," by Mr. W. Thwaites; "Australian Timbers," by Mr. Jas. Perrin; "Modern Drainage Principles and Practice," Parts I. and II., by Mr. A. M. Henderson; "The Advantages of Arbitration," by the president, Mr. Oakden, and Messrs. Billing and Inskip; "Architecture and Poetry," by Mr. E. W. Dobbs; "Architects and Electricity," by Mr. F. A. Fitts. A smoke night, in conjunction with the Institutes of Surveyors and Engineers, was held on September 12 to inaugurate the combination of the Institutes in one set of rooms, and proved successful.

THE EFFECT OF FROST ON GREEN MASONRY.

DURING the construction of the new theatre in Zurich, Switzerland, it became necessary to carry on part of the masonry during the winter. The contractors obtained advice from several sources as to the manner in which the work should be done, but as the recommendations were very diverse the Austrian Society of Engineers and Architects, which has made a special study of cements, limes and mortars, was asked to recommend a course of procedure. The matter was turned over to the cement committee, and this body instituted a series of experiments, which are described in the following free translation from the report in the Society's journal, and which appears in the *Engineering Record*.

The experiments were made in two ways; the first with brick masonry, and the second with rubble masonry, using stone of two kinds. This appeared desirable in order to determine if there was any difference between materials which were unlike hygroscopically. The materials used were dry and free from snow and ice, and the mortar was mixed as stiff as possible. The limes and cements were all tested in the municipal experimental station, according to the system of the Society.

The separate pieces of brick wall tested were about 3'28 feet long, 6'56 feet high and 12 inches thick, and were made with lime, Roman cement, Portland cement, mixed lime and Portland cement, and slag cement. The test walls made with these five mortars were laid with unwarmed water from the city mains and with water warmed to a temperature of 77 deg. Fahr. A series of tests was also made with Roman and Portland cements and cold water, to which 7 per cent. of its weight of cooking salt had been added. All mortars were made with one part of the cementing material and two parts of sand. In the mixed mortars twice as much lime as Portland cement was used. The lower half of the walls was partly protected by timbers, but the upper portion was entirely exposed. A few tests were also made with brick masonry laid with Hausleitner's frostproof Roman and Portland cements.

The test blocks of rubble masonry were 3'28 feet long, 6'56 feet high and 16 inches thick. The stone used was partly limestone and partly sandstone. These blocks were made with lime mortar, Roman cement mortar and Portland cement mortar, mixed with cold and hot water and cold brine as before.

The brick walls were started the last part of December, when the temperature was 26 deg. Fahr., and the fourteen pieces were finished in about three weeks. The temperature of the air was taken three times daily until the middle of April, the lowest temperature being on January 2, when 3 deg. above zero Fahr. was registered. The walls were pulled

down June 6. It was at once apparent that those pieces of masonry laid with mortar containing lime had suffered more from the frost in the exposed upper part than in the portions protected by timbering, since in the former the mortar had plainly been frozen. The following remarks give an idea of the condition of the walls, as revealed by an examination of the joints with a sharp iron.

1. Lime mortar mixed with cold water. The mortar in the joints had hardened but feebly, and the bricks could be pulled apart by hand without exercising any noticeable amount of strength.

2. Lime mortar mixed with warm water. The mortar in the joints had hardened feebly, and there was no adhesion between the bricks and the mortar.

3. Roman cement mortar mixed with cold water. The mortar in the outer and inner joints had hardened moderately, and there was considerable adhesion between the bricks and the mortar.

4. Roman cement mortar mixed with warm water. The joints were quite brittle and the inner portions of the mortar not particularly well hardened; the adhesion between the bricks and mortar was quite good. The part of the wall protected by timbers was in better condition and excelled any of the preceding walls.

5. Portland cement mortar with cold water. The joints were hard and the mortar clung well to the bricks. The protected part was better than the other in this case.

6. Portland cement mortar with warm water. The joints were hard, the mortar adhered well, and the entire piece of wall was a little better than any of the preceding.

7. Lime and Portland cement mortar mixed with cold water. The mortar was badly mixed, brittle and crumbling, but adhesive.

8. Lime and Portland cement mortar mixed with warm water. The mixture was uniform in this case, but the mortar was brittle and not well hardened in the interior, although adhesive.

9. "Frostproof" Roman cement mortar mixed with cold water. The mortar was well hardened, and there was a good adhesion between it and the bricks. A plaster of the same material, put on a part of the wall at the request of Herr Hausleitner, was thoroughly hard and without sign of injury.

10. "Frostproof" Roman cement mortar mixed with cold water. This mortar was well hardened, and adhered very well to the bricks. A plaster of the same material was thoroughly hard and without defects.

11. Wittkowitz slag cement mortar with cold water. The joints were brittle, and the mortar fell into little particles when scratched out with the iron. The inner parts, which had hardened somewhat, were crumbling, and showed but a slight adhesion to the bricks.

12. Wittkowitz slag cement mortar with warm water. The condition of this wall was but slightly better than of that last noted.

13. Roman cement mortar mixed with cold water, to which 7 per cent. of salt had been added. The mortar was brittle and crumbling, adhering but slightly to the bricks.

14. Portland cement mortar mixed with cold water, to which 7 per cent. of its weight of salt had been added. The mortar was well hardened throughout and adhered well to the bricks.

The masses of rubble masonry were built on a succeeding year, being started on December 28 and completed about two weeks later, the temperature ranging from 7 deg. to 25 deg. Fahr. The blocks were examined on April 7, and were found to be in the following condition:—

Limestone Rubble.—1. Lime mortar mixed with cold water. The mortar was completely frozen and brittle, without any adhesion to the stones. The block had fallen completely.

2. Lime mortar with warm water. The mortar was entirely frozen, brittle and without adhesion.

3. Roman cement mortar with cold water. The mortar had hardened pretty well, but had not the slightest adhesion to the stones, which could be removed from their beds without injuring the latter.

4. Roman cement mortar with warm water. The mortar was quite well hardened, but did not adhere in the slightest degree to the stones.

5. Roman cement mortar mixed with cold water and salt. In this block there was a partial adhesion between the stone and cement, and the latter had hardened somewhat better.

6. Portland cement mortar with cold water. The mortar had hardened very well and the adhesion between stones and mortar was quite good.

7. Portland cement mortar with warm water. The conditions were the same as with the last block, although the adhesion may have been a trifle greater.

8. Portland cement mortar mixed with cold water and salt. The mortar was very hard and adhered to the stones very well. The tearing down of the wall required considerable strength and necessitated the use of bars and other tools.

Sandstone Rubble.—1. Lime mortar with cold water. The

mortar was entirely frozen, brittle, easily broken, and without a trace of adhesion to the stones.

2. Lime mortar with warm water. The condition of this block was the same as that of the first.

3. Roman cement mortar with cold water. The joints were badly frozen, the mortar crumbling and slightly hardened. There was no regular adhesion between it and the stone.

4. Roman cement mortar mixed with warm water. This block was in the same condition as the last.

5. Roman cement mixed with cold water, to which salt had been added. The mortar was well hardened and adhered fairly to the stones.

6. Portland cement mortar with cold water. The mortar was well hardened, but its adhesion to the stones was only partly good.

7. Portland cement mortar with warm water. The conditions were much the same as in the last block.

8. Portland cement mortar mixed with cold water, to which salt had been added. The mortar had hardened very well and adhered firmly to the stones. The block could not be broken apart without tools.

The conclusions of the committee from these experiments are that in brick masonry laid in frosty weather mortars into which any part of lime enters should not be used. Roman cement mortars behave fairly well under such conditions, and Portland cement mortars give good results. The use of warm water gave somewhat better results, and salt materially increased the resistance to frost. With rubble masonry, using either sandstone or limestone, lime mortar was entirely out of place, and Roman cement mortar gave poor results unless mixed with salt. Portland cement mortar behaved well, especially with the addition of salt. The final recommendation of the committee is in laying brick or rubble masonry in winter to use only Portland cement mortar, mixed with salt if possible.

A similar subject was considered at a meeting of the American Society of Civil Engineers on March 7, when a paper by Mr. Cartwright descriptive of an electric station at Rochester was read. Colonel Craighill endorsed Mr. Cartwright's practice of soaking the bricks and salting the mortar in freezing weather. Mr. H. W. Brinckerhoff thought that the action of wet bricks and cement mortar would be very severe on the bricklayers' fingers, but Mr. Cartwright said that they were protected by rubber finger-tips, which he furnished by the gross.

Mr. B. R. Green thought that handling the bricks with the left hand exclusively, and the cement with a trowel in the right hand, the masons would not necessarily get any mortar on their fingers, but Mr. Cartwright explained that here the heart of the wall was filled with thin grout, in which the bricks were longitudinally rubbed along to a bearing and usually submerged. This made it impossible to lay them clean handed.

Mr. George Hill said that New York architects usually preferred to wait until warm weather to lay brick rather than do so with salted mortar and incur danger of more efflorescence. Here in New York he had cut into walls five or six months old that had been built with their centre courses flushed and rubbed down in stiff cement mortar, and had found the bricks and mortar inseparable and as hard and solid as stone. He knew of one brick wall where at a height of over 100 feet, with a south and east exposure, the efflorescence had reappeared annually for five or six years.

Mr. Cartwright said that it must have been due to some supply of moisture, and could be readily removed with a wash of dilute vinegar.

NATURE AND ART.

A LECTURE was delivered lately in Leeds by Mr. F. Suddards, of the Yorkshire College, on "The Influence of Nature on Art." In the course of it he said:—It has been said, with very much force and with a considerable amount of truth, that "all art is an imitation of nature." This must not, however, be construed too literally. Art is something more than a literal imitation of anything in nature, though there can be no doubt that it is so dependent on nature for its active life and development that it is impossible to separate the one from the other, and I purpose to bring before you the relation which there is, and has been, between nature and art, principally as it refers to the higher branches of painting and sculpture, but incidentally also as affecting the decorative and applied arts. A striking feature of the art of Oriental nations is that it has been nearly always stationary. In many parts of Asia, such as Persia and India, objects of great beauty, full of graceful design and glowing colours have been produced. Their treatment of nature is, as befits the decorative purposes to which their art is applied, very conventional, but it is also stereotyped and traditional, the productions of one age merely repeating those of former ages. Indian art, in common with Moresque, Persian, and the bulk of Oriental art, is distinguished by the compara-

tively slight reference which it has to nature; it never represents with any approach to truth a natural fact. For centuries it has been little more than a tradition; producing, it is true, many objects of beauty, but producing them without soul or energy. So long as the artist is content to simply go on repeating what has been done oftentimes before by his forefathers, and to rely upon traditional or purely imaginary forms, instead of going to nature for inspiration and guidance, progress or change will be conspicuous by its absence. In all branches of art workmanship, if there is to be any life or progress in it there must be the influence of nature constantly at work. A period in the history of art which offers a strong contrast to the traditional art of India, is that which in its highest development produced the great masterpieces of the Italian Renaissance. This great epoch embraces the period from the thirteenth to the sixteenth centuries, and has as its generally accepted founder Giotto, who lived and worked in the latter part of the fourteenth century. To understand the full value of his influence we must glance farther back, to the dark days of the centuries preceding. Between the fifth and the tenth century art in Italy had sunk to a very low ebb, and had become almost as stationary and traditional as that of the period to which I have just alluded. Early Christian and Mediæval art in Italy was characterised by its insipidity and formality, being little more than the ghost of the Classic, Byzantine and Mohammedan styles, or rather of a conglomeration of their styles, and containing neither the beauty of line and proportion or the marvellous knowledge of the human figure which belongs to Classic art, nor the skilful conventionality which was the peculiar quality of Mohammedan art. The Classic forms, so beautiful in the original, became stiff and cold, the figures became expressionless, and the draperies became wooden and unnatural—all this resulting from that easy-going tendency which led artists to merely copy the forms which tradition had handed down without understanding them, and to ignore the importance of that study of nature which was the basis of the success of Greek art. It was not until the twelfth and thirteenth centuries that art in Italy began to show signs of new life and vigour, and to lay the foundation of the Renaissance. The truth began to dawn upon the people that art, to be of any value whatever, must be a living reality, and this great truth received its first really great exponent in Giotto, whose life's work was the means of spreading the new gospel of nature in art to Italy and the world. In his wall-pictures (and nearly all his works were painted on walls), Giotto endeavoured to represent nature as he saw it, trying not only to get more truth in the representation of external forms and circumstances, but also aiming at giving the soul and character of his subjects, adding variety of expression where insipid monotony had hitherto existed, and giving description of incident where before none had been attempted. He boldly attacked subjects which had previously been either unthought of or had been considered impossible. Descriptive pictures of biblical scenes were a great advance on the old and stiff pictures of saints and angels, and instead of the flat, gold backgrounds of his predecessors, Giotto added perspective representation of architecture, which, though not perhaps scientifically accurate, helped to indicate the wonderful power which the study of nature was giving him to get clear away from the lifeless traditions of previous centuries. And not only was linear perspective attempted, but also the perspective of landscape and atmosphere. Crude and stiff they were, perhaps, but nevertheless a distinct advance on the usual gold background which had hitherto been in vogue. This great pioneer and his pupils were thus constantly opening the eyes of the people to the great and unfathomable beauties of nature. Art was still to a large extent the handmaid of religion, but not exclusively so, and various forces were helping to carry forward the movement begun by Giotto. The science of perspective was mastered; the anatomy of the human figure was made an important study among artists, and the invention of engraving in the fifteenth century also did something to help its progress, while a still more important impulse was the invention of oil-painting, which offered a medium possessing far greater scope for the realistic imitation of nature than any which had hitherto existed. All these forces were hurrying forward the time when the great masters of the Renaissance, Leonardo da Vinci, Michel Angelo and Titian, were to brighten the world by the splendour of their productions. By means of a series of typical examples which were shown on the screen, the lecturer then enabled his audience to realise the extent to which the study of nature had affected the progress of the period of art of which he had spoken. The names of Raphael, Leonardo da Vinci, Michel Angelo and Titian, he continued, are inseparably associated with this period, and in their works we see not only the highest perfection that had ever been reached in the technical side of painting, but also a combination of the highest forms of art with truth and consistency to nature. After dealing with the relation which the study of nature bears to modern art, a topic touched upon in his preceding lecture, Mr. Suddards continued:—With refer-

ence to the way in which art and nature are to be studied in relation to each other, it is possible that what I have said as to the relation of nature to art may lead some to think that mere imitation of nature is sufficient. If this were so all works of art of an ideal character would be bad, because they are not literal copies of some natural object or scene. A mere mirror-like rendering of whatever lies before us is not very high art, although for the purposes of the student it is a very necessary training. Art is something more than this, just as eloquence consists in something more than a merely accurate statement of facts. A portrait which is merely a soulless copy of the features of a man, without a hint of his character, is a poor thing. And so it is the interpretation of nature, not the literal imitation of it, which must constitute good art, and to the truthful observation of nature must be added the human feeling and authority in the manner in which it is interpreted. Even in landscape-painting, which is perhaps of all forms of pictorial art the one which lends itself most to literal imitation, artists are rarely content to copy nature without in some degree modifying their subject to suit their ideal. An examination of many pictures which seem to be nothing more than bits of natural scenery faithfully copied, and such pictures are often pleasing and acceptable, will show that the subject has not been copied with topographical accuracy. Objectionable features may have been omitted, the more beautiful parts may have been accentuated, and much depends on the selection of the most suitable condition of atmosphere and effect. A commonplace subject may under certain conditions look entirely beautiful; the artist may see charms of so subtle a character as to escape the notice of the ordinary observer, and his aim is to record nature in the aspect which seems to him most attractive rather than to paint a picture which will be at once recognised as being such and such a place. A landscape-painter does not feel flattered if he is told that his picture is almost as correct as a photograph, even though the critic may in the innocence of his heart intend it for a huge compliment. Photography has rendered immense service to art, but it is after all a science and not an art, though a science to which art can be applied. We all know the difference between photographs produced by a man with a knowledge of and feeling for what is artistically beautiful, and those produced by one who is totally without artistic feeling. The gap between them is great, but there is an even greater gap between photography and art. Here a further series of views taken, some from photographs and some from paintings, were thrown on the screen, and the lecturer explained to the audience how marked the contrast was between the two, stating with reference to a photograph of St. Hilda's Abbey and a painting of the same subject by Mr. Bernard Evans, which were in turn displayed, that the one reproduces every stone in the masonry, but the other gives the soul and poetry of the building as it rears its head to the heavenly light with which it is illumined. Art, he concluded, adds something to the natural beauty, but let us not forget that it is dependent for its healthy existence on nature. It is, as I have shown, a fact in history that as soon as art ceased to rely upon nature for guidance the result was decline and decay; but I would repeat that the true position of art to nature is not one of literal or photographic imitation; and if this can be realised, much misconception will be done away with and a higher appreciation of the more subtle beauties in art will be acquired.

SUSSEX ARCHÆOLOGICAL SOCIETY.

THE annual report of the Sussex Archaeological Society, which was read at Lewes, states that the past year had by no means proved uneventful from an antiquarian's point of view. The archaeological discoveries in Sussex, if not particularly numerous, included one "find," which in some respects might be regarded as the most important ever occurring in the county. This was the discovery of the Saxon cemetery at Goring, within the area of the camp on High Down Hill, which yielded a rich harvest of arms, ornaments and vessels, some being examples of a type not before known to occur in Sussex. A curious series of caves at Levant, found by accident, had been excavated and explored, and in Clayton and in Rotherfield churches mural paintings were uncovered, and, besides minor finds, the discovery of mural paintings upon an historic house at Pevensey, and of prehistoric remains at Eastbourne, had recently been reported to the hon. secretary. Although it was gratifying to receive these proofs that Sussex, long ago declared to be "worked out," still continued to furnish objects that excited the attention of every "student of the past," and also to know that in due course a record of these discoveries will appear in the volumes of the Society's "Collections," it was nevertheless with regret that the committee observed how few, comparatively speaking, of the portable antiquarian objects found in the course of each year were secured for the museum of the Sussex Archaeological Society, or for that of any similar institution in the county. In connection with this matter the committee invited suggestions

from members on the pressing question as to how the committee could best secure more adequate provision for the storing and effective exhibition of objects of art and rarity illustrative of Sussex archæology than was presented at Lewes Castle, which, though it had its attractive features as an historic and, in some respects, beautiful ruin, was not very well adapted for the purposes of a museum and library. The membership of the Society now stood at 656, and though a number of subscriptions were in arrears, there was a balance in hand of 52*l.* Details were given of the two days' tour in the summer around Chichester and Bosham. It was hoped that during the coming summer a start would be made with the publication of the Calendar of the Church Plate of Sussex and the Parish Registers, and it was intimated that nearly 30*l.* had been contributed towards the cost of excavations beneath Hastings Castle, in order to trace out a series of passages, supposed to be dungeons, and which appear to run in the direction of the Keep. The report and accounts were adopted. Horsham was chosen as the place for the summer meeting.



Cooper's Hill.

SIR,—The Italian work referred to in your notice of Mr. Francis, and ascribed to him, belongs to the additions made about 1872 by the late Sir Digby Wyatt, who converted the mansion built by Baron Grant into the Royal Indian College, and certainly doubled the original structure.—I am, yours obediently,

R. PHENÉ SPIERS.

Carlton Chambers, 12 Regent Street :

March 24.

GENERAL.

Sir P. Cunliffe-Owen, late director of the South Kensington Museum, died at Lowestoft on Friday in his sixty-sixth year.

The Glasgow Corporation are likely to purchase *Four Faggots*, by Mr. David Murray, A.R.A., the price being 400*l.*

Mr. Barber, C.E., of Silver Hill, St. Leonards, won the prize of 100*l.* offered for the best design for a new bridge over the Dee, costing 12,000*l.*

A Committee of the Edinburgh Town Council are to consider the advisability of forming a municipal collection of painting and sculpture, by purchase of works from exhibitions held in the city.

The Third Panel for the Ayr Burns statue, subscribed for by the Masonic lodges, is now completed. The subject is the "Jolly Beggars," and the sculptor is Mr. D. McGill, London. All the panels are expected to be placed in position by May.

Mr. E. J. Williams, architect, Bristol, has purchased Eagle House and grounds at Brislington, near Bristol, for a residence. The price was 4,130*l.*

Mr. Robert Gilmour has been appointed resident engineer to Greenock Water Trust, in room of Mr. James Wilson, who has removed to Edinburgh.

Mr. H. Green, of Norwich, has been successful in the competition for the Board school and master's house at Clench-warton, Norfolk. The design by Mr. H. Gibbons, of Westminster, was placed second. Sixty-four sets of plans were sent in.

Mr. J. M. Gray, the first curator of the Scottish National Portrait Gallery, died on the 22nd inst. in Edinburgh, after a week's illness. Mr. Gray was appointed about ten years ago. Since then he has arranged, classified and catalogued the collection of portraits.

A Cope which Mr. Bodley, A.R.A., designed, was presented to the Bishop of Lichfield on Tuesday. It is made of red stamped velvet, richly embroidered in gold. The orphery contains figures of six saints specially connected with the diocese, and the Annunciation forms the subject of the design of the hood. The morse is set with large carbuncles and amethysts.

The "Curfew Tower" at Barking will be restored if 500*l.* can be raised. The subscriptions amount to about 200*l.*

A Statue of John Howard, the philanthropist, by Mr. A. Gilbert, R.A., was unveiled in Bedford on Wednesday.

An Arts and Crafts Society has been started in Sheffield.

Mr. Thomas Helleyer, architect of the Royal National Hospital for Consumption, died on Saturday morning at Ryde, aged eighty-three years.

Mr. C. F. Binns will read a paper before the Society of Arts next Wednesday upon "The Elements of Beauty in Pottery."

A Post Office is about to be erected in Lichfield Street, Wolverhampton.

The Architect.

THE WEEK.

THERE never was a time when the demolition of ancient buildings caused so much regret as it does now in England, and yet they are being removed to an extent that is without precedent. It might be supposed that everybody is prepared to undergo sacrifices to preserve any building that is old; but when subscriptions for such a purpose are sought they are only to be obtained from a few. It is hard to expect that the owners of the buildings are to suffer unaided and to resist the changes which are demanded by the circumstances of the present age, or that architects should avoid any participation in those changes out of reverence for the work of their predecessors. If the public desire the preservation of old buildings it would be more becoming to agree to be taxed for that purpose than to be charging others with vandalism. But architects and antiquaries, if they are powerless to prevent destruction, can at least aid in preserving truthful records of the victims. Several efforts of the kind have been undertaken, the latest being exemplified in the drawings from the streets of the Metropolis which Mr. ROLAND W. PAUL has prepared and published at his own office under the expressive title "Vanishing London." The majority of the subjects are taken from Fleet Street, the Strand, and the streets adjoining that great highway. There are others from the eastern part of the City and some from Westminster. Altogether forty plates are given. Mr. PAUL draws like an architect—that is, he is careful in suggesting the character of all the elements of a building, and he does not evade the representation of detail by that more easy method of treatment which consists in making the building a subject for displaying contrasts of light and shade. It is not to be supposed that his style has the stiffness which is imparted by ruled lines; it is no less free from the irregularities which are believed to be a necessity of the picturesque. The drawings are exactly suited to become records of the buildings, and are therefore preferable to representations that might be considered as excelling them in pictorial effect. Most of the buildings are of the seventeenth and eighteenth centuries, and exhibit a restraint that is not always seen in provincial examples of the same period. Some examples have vanished since the drawings were taken, others are doomed to follow them; it is to be hoped that the buildings which occupy the sites will excite as much interest a century hence, or when their turn to disappear arrives.

THE collection of casts of Greek and Roman sculpture which filled a hall at South Kensington was brought together by the energy of Mr. W. COPLAND PERRY, the author of an excellent history of the art. Everybody who possessed a little acquaintance with the tactics of the department must have wondered to see an outsider exercising so much power. The reason was Mr. PERRY was able to persuade Lord SPENCER, the President of the Council, and while he was in office the officials were subjected to some sort of control. The casts were a valuable addition to the museum, especially as the collections are not rich in examples of Classic art. Mr. PERRY, we suppose, was happy in the thought that his casts would be more appreciated as years passed. He did not realise the jealousy which flourishes at South Kensington. At the end of last year he was alarmed to see some of the casts turned into a long dark gallery, but he was assured that tapestry was to be introduced to form backgrounds for the figures, and only a few of the casts were to be removed. On visiting the gallery a week or two ago, Mr. PERRY tells us how he "was struck dumb with astonishment to see that the whole collection, with the exception of the Parthenon and Phigaleian friezes—which look forlorn enough in their present surroundings, and which cannot be placed in the low dark gallery—had been swept out of the hall to make room for other things. . . . In fact, one can no longer speak of a Cast Museum in London. The

statues, collected with so much consideration and labour, have been contemptuously crowded out into a dismal corner, and a great and useful work practically annihilated." Mr. PERRY has received an unworthy recompense for so many years' toil, but he ought to remember that he is only one of the unofficial public and that he erred by anticipating official action. In the residences it is likely to be said that he should be grateful that even a dismal corner is allotted to his labour. No matter what the officials say, Mr. PERRY's fate is not encouraging to men who are desirous to increase the educational value of the museum.

IN Germany the liability of employers for accidents to workmen rests chiefly on the law of insurance, which dates from 1884. All employers are obliged to insure their work-people and clerical staff, even when the employment is temporary and unpaid. There are special associations for different industries, and the statutes must be approved by the Imperial Insurance Office. Injuries include those which are internal as well as external, loss of intellect, memory or nerve. When compensation is claimed, it is necessary to trace the injury to some specific cause, and not to the mere normal exercise of the occupation. Generally the person who is to gain or lose most by the undertaking is held to be the employer. Thus, in building contracts, it is not the capitalist who advances the funds, but the master builders, carpenters, &c., who are responsible. Employers' contributions to the associations are proportionate to their annual expenditure in wages. The amount of compensation is based on the wages received by the workmen during a year. So long as he is completely incapacitated, he is to be allowed two-thirds of his wages. For partial disablement he obtains a fraction of that maximum proportionate to the extent of the injury. In case of death, twenty days' payment (in no case a sum less than 30 marks) are to be granted towards funeral expenses. The widow, until her remarriage, is allowed about 20 per cent. of her husband's wages, whilst 15 per cent. is allowed for every child under fifteen who has lost one parent, and 20 per cent. if it has lost both. The total compensation to widow and children must not exceed 60 per cent. of the deceased's wages. In case of remarriage she receives as composition three times the amount of her annual allowance. If the deceased was the sole support of parents or grand-parents, they may receive 20 per cent. of his wages during their lifetime.

THE building trades show a rather large proportion of accidents. In 1888 the number of insured was 784,304 and there were 3,356 accidents, 584 being fatal and 410 causing total disablement. In 1892 (the last year for which there is a return) the insured numbered 946,702, while the accidents rose to 5,657; there were 694 deaths and 308 cases of total disablement. In most other trades the number of accidents was also increased. Various causes were assigned, among them being the division of labour and the abolition of the system of master, journeymen and apprentices. The building insurance associations ascribed the increase to the lack of technical knowledge displayed by the builders, and also to the undue concentration of workmen on the same spot, owing to the necessity of constructing buildings rapidly. In 1891 the sum of 7,665,150 marks was paid in compensation for accidents on buildings. The administration is also costly, amounting in 1892 to five millions of marks. It is acknowledged, however, that among all the social measures which followed the imperial message of 1884, the law of insurance against accidents appears to have been the most productive in good results. The successful working of the measure has been facilitated by the administrative machinery for military and police purposes. It has also been aided by the organisation of the old German guilds, and it is upon the guilds that the trades associations have been founded. Liberty has been left to the various trades to form their associations according to their own wishes. It was originally proposed to unite the industries of brick-making, potteries and quarrying into one association, but at the request of the trades three have been formed. In the same way it was intended to unite chimney-sweeping and building, but the sweeps preferred independence.

THE ARBITRATION CLAUSE IN AMERICA.

IT was often alleged by builders that they suffered inconvenience and loss by what is commonly known as the arbitration clause in contracts. At one time the conditions were of an absolute kind and in keeping with the rigorous spirit of legislation in general. The architect was accepted as being supreme in all disputes that arose. By degrees lawyers were able to obtain some modifications of the relations between architects and builders. As a consequence, in most modern English contracts provision is made for an appeal (especially on points in which the architect might be tempted to be biassed) to an arbitrator, who has had no share in designing or carrying out the works which gave rise to the dispute.

The change in spirit cannot be more clearly exemplified than by a comparison of contracts with the War Office, for they are likely to be inspired by discipline in its most rigorous form. It used to be the rule to give the commanding officer full authority in case of difference to purchase materials or to employ any men he might consider necessary. There was a saving clause which said:—"If at any time the contractor shall have reason to complain of undue or excessive severity in the conduct of the superintending officer, the contractor will, upon his representing the circumstance to the Board of Ordnance, have such proper redress as the honourable board shall find he is justly entitled to." A man could not have much experience in military works without having a misgiving that proper redress might take an unsatisfactory form. To some extent the same sort of saving clause is still in use, the Secretary for War taking the place of the Board of Ordnance; but it is also provided that "if so requested by the contractor, before giving his decision, the Secretary of State for War may appoint one or more competent persons, as he may think fit, to investigate and report upon the matters in dispute, the expense of such investigation being charged to the War Department or to the contractor, at the discretion of the said Secretary of State for War." This concession is almost equivalent to the clause proposed by the Builders' Association.

In the United States it would appear that the principle by which the architect becomes autocratic still prevails to a greater extent than in England. That at least is the conclusion that must be drawn from the proceedings of the Builders' Convention which was held in Boston on four days in February. The president, Mr. IRA G. HERSEY, declared the past year to be most disastrous, for the builders, in common with most men in business, could not escape from the general depression, but he considered they withstood the shock as well as the representatives of interests of similar magnitude. Among the events on which the President was able to congratulate the members was the increasing use of the approved "Uniform Contract," in which the arbitration of outside architects or specialists is recognised. On that subject he said:—

The method of arbitration recommended by this body is in more or less successful operation in several of our cities. The great obstacle to its universal adoption is the distrust that has been engendered by long lists of arbitrary acts. These are by no means confined to either side, but have been too commonly the weapons used as each in turn has felt they had the power to enforce their claims. In this respect there has undoubtedly been a steady growth of favourable opinion, until there is no fair-minded man who is not willing to accept the principle of arbitration as the fairest and wisest way of settling all misunderstandings. The wisdom of having these boards appointed in advance, before the heat of dispute has warped our judgment, is also, I think, unquestioned. But the benefit of having them in constant or frequent session is not so apparent, and has, in the absence of questions of importance to discuss, a tendency to magnify and distort minor issues until they become a disturbing influence and tend to defeat the very purpose for which the board was formed.

The Secretary, in his report, referred to an attack on the form of uniform contract by the Boston Society of Architects, but declared that the effect was to open the eyes of many people to its virtues. He recommended the discussion of the shortcomings to be undertaken in a temperate style; at the same time, he pointed out that all power to alter the conditions was vested in the joint committee of architects and builders.

Mr. J. S. STEPHENS, of Philadelphia, who is one of the committee on uniform contracts, was the first to explain

that the benefit which they expected to derive from the admission of arbitration was jeopardised:—

You remember, he said, that it was the universal custom, and is still the custom among some architects, to have inserted a clause in their contract that in case of a dispute the decision of the architect shall be final and binding. That was the one feature of the old contracts that we were most opposed to, and that we felt was the most unjust to the contractor, and in outlining our business with the first committee we laid down as a principle that the architect was the agent of the owner. We laboured a long, long while before we could impress upon the architects that that was a fact; we let everything else stand and bent all our efforts toward proving to them conclusively that the architect was the agent of the owner, and we had a vote on that subject, and it was agreed to. We felt then that we had some ground to stand upon, for as soon as it was settled that the architect was the agent of the owner, it wasn't much trouble for us to prove the manifest injustice of asking the agent of one party to decide differences between the two; our point was gained, and we were able to introduce this clause of arbitration. If you remember, in our contract it is stated that, in case arbitration be asked for, each party shall select one, and the two thus selected shall select a third, and their decision shall be binding.

It appears a case has lately occurred in Philadelphia which denotes that in spite of the resolution of the joint committee arbitration has not come into fashion. One of the parties to a building contract in which arbitration was agreed upon as a condition when a dispute arose declined to adopt that course of proceeding. The builder appealed to his lawyer, and was informed that the recalcitrant party was acting within his rights. Other lawyers were consulted, and came to the same conclusion. It was found that the decisions in the Supreme Court of Philadelphia made it necessary that not only the principle of arbitration should be recognised in the conditions of contract, but the names of the contemplated arbitrators should be introduced in the deed. The Act 52 & 53 Vic. c. 49, known as the Arbitration Act, provides against an evasion of that sort, for it says, "In this Act, unless a contrary intention appears, submission means a written agreement to submit present or future differences to arbitration, *whether an arbitrator is named therein or not.*" English decisions are received with respect in the American Courts (and *vice versa*), but a definition in an Act has not the same claims to attention. It is hard on builders to have their contract deeds nullified at the pleasure of people who may wish to avoid paying debts, but it is only by that sort of experience that laws are brought into a workable condition.

Another speaker, who contended that more of the disputes which necessitate arbitration arise out of defective drawings and specifications than out of questions of price, offered some strange revelations about American working drawings. He said:—

I find that I get a set of plans with a line of cornice, say, shown on them, and I frequently find that there is nothing in my specifications or plans to tell me whether it is iron, stone, metal, or what it is. I frequently find that in an elevator shaft walls are shown without any foundation plans shown for them. Now, my experience is that my disagreements arise not so much on variation as to price, but as to the work to be done. It frequently happens, and it has happened to me many times, that I refuse to do work under a contract, and the architect claims, under the specifications that take in almost everything in this world, that it is in my contract, and I have got to do it. Now, what I claim is that the uniform contract has provided for no means of arbitration except upon two points—first, as to the price of extra work; and second, as to the damages for delay. I have to-day a disagreement on a contract where I have a few thousand dollars coming to me, and the architect, although I have got a uniform contract in that case, absolutely refuses to arbitrate, or the owner refuses to arbitrate, and I do not know of any means of making him. Now, of course, we all agree that it is very essential and that it is very fair and proper that we should have some clause of arbitration. I have in mind one case I have tried to arbitrate, where I have 15,000 dols. or 16,000 dols. involved. That building has been occupied since March 1893, and it will take me, I presume, at least three years to get any action on that at all; in other words, I am kept out of my money by arbitration longer than it would take me to get it before a Court. Of course there is something monumentally unfair about that.

It would be preferable if in the cases mentioned the architect had been accepted as the sole arbitrator. There may, however, be many architects in America who are disposed to interpret conditions literally, and in that way give trouble. A case of the kind was brought before the Convention. There is a clause in the uniform contract which says:—"The contractor, under the direction and to the satisfaction of the owner and architect, must complete the work." It is not happily expressed, but still it is sufficient to prevent the settlement of an account without much

reason. In the case in question the contractor, after fixing some of the steam heat radiators which are common in America, painted and gilded the pipes. But it was impossible to apply gold in the narrow spaces between the pipes. The architect, it appears, was theoretical rather than practical, and he said the work was not finished according to his satisfaction. The owner, who happened to be impetuous, was also dissatisfied, and the consequence is the contractor remains unpaid. What is more, he appears to have no remedy, and the model form of contract is not of much service to him. An example of that kind suggests that "'cuteness" has not ceased to be a characteristic of the States.

Builder and building owner may agree to arbitration, but another obstacle has to be overcome, viz. the appointment of an umpire. The secretary of the Convention related how he acted as one of the arbitrators in a case where from 75,000 dols. to 80,000 dols. were at stake. The building owner's lawyer said there was no need to appoint an umpire at once, as the arbitrators could proceed until differences arose. The proceedings were carried on for two or three weeks, then, as apparently was expected, there was a dispute between the lawyers and arbitrators about prices, which made the existence of an umpire a necessity. Then came another contest about the selection of the third judge, which was ended by the abandonment of the inquiry.

The law's delay has also to be considered. One of the builders read a letter from his lawyer, who informed him that as the Courts were far behind in their work, it was impossible to reach the first stage in the trial of an action in which he was concerned under two or two and a half years. Afterwards it might be necessary to go through the Appellate Court and the Supreme Court of the State. The lawyer observed how "it is a difficult matter to keep track of a score of witnesses for two or three years, in order that they can give testimony on the merits of a case that may be tried at that time, and may not be tried for a year or two later." The costliness of the action naturally bears a proportion to the difficulty.

It is an old belief that in a multitude of councillors there is safety, and American builders appear to believe they will receive more justice from three referees than from one architect. They would do well to remember what one of their countrymen said about power educating the potentate. From having to decide judicially, English architects have something of the equitableness and impartiality of those who wear ermine in the Courts. In dealing with differences they could not be described as agents of the owners, although in law they have to act as such at other times. If the American architects were as much trusted it is not unlikely they would save builders from the waste of money and loss of time and peace which uniform contracts cannot prevent.

F. WALKER AND J. W. NORTH.

AN exhibition of works by the late Frederick Walker and Mr. J. W. North, A.R.A., has been arranged in the rooms of the Birmingham Society of Artists. On Thursday in last week the president, Mr. Herkomer, R.A., delivered an address on the characteristics of the two painters. He asked what could be more wholesome for students than to see their pictures, and what was more likely to stay the wave that was passing over English art just now—the mad striving for originality at all cost? There they had two eminently sane artists, neither striving after originality, but both accomplishing it by dint of their own idiosyncrasies, developed by earnest attention to nature. There they saw not only sweet nature represented, but sweet English nature, for the tenderest note in English nature had been struck in both—true, noble and pure nature, free from all taint of eccentricity, free from all desire to excite surprise, and yet free from all tediousness. The art practised by both men belonged to the best side of every man and woman who loved England. It was a natural art, evolved out of the resources nearest at hand, and this constituted in it an element of greatness. Not the least interesting point about it was that it was more or less an outcome of the feeling for nature fostered by wood-draftsmen, for both men started as such. Both were apprenticed to an engraver to draw, not engrave, on wood. But some time before Walker began to paint North was doing little water-colour drawings from nature, when he went into the country and managed by some art means or other to get his living since he was sixteen years of age. In those early drawings North's

identity might be plainly visible. Walker, always the better draughtsman and man of larger scope, was long before he could shake off the trammels of black-and-white work, so that his early work was rather hard and cold in colour. It was principally through the companionship with North that Walker merged into the colourist, which found its highest expression in *The Fish Shop*. In this drawing Walker reached not only his highest manipulative aims, but the highest possibilities of the material. It was a triumph to have reached such perfect harmony between detail and breadth, between colour and tone, between drawing and sentiment. As he would call Millais's picture of *The Carpenter's Shop* the pivot upon which English art turned, so would he call *The Fish Shop* the climax of English water-colour art. Perhaps if Millais's picture had not been, *The Fish Shop* would not have been possible. The search for truth did not stop with Millais. But truth to nature took a particular artistic form in Walker, which culminated in this identical drawing. Both North and Walker started a truer daylight aspect in their wood drawings, and Walker was the first to represent the light of England's grey sky—not one of those foggy somethings—that magical light which gave each object in nature its full value, both as to form and colour, and yet gave mystery to parts that were only needed to balance the composition. The lay audience would forgive him if he addressed himself more particularly to students. The Walker school had right aims in their work, and although both men were before his (Professor Herkomer's) time by a decade, there was in his time still a striving to make all illustrated work pictorial, and all pictures illustrations of true scenes in nature. This gave the illustrator a chance of touching subjects that he could afterwards render in colour in a more complete form. *The Vagrants* was first drawn on the block and afterwards painted. With this practice of making black-and-white pictures the painter's hand showed a cunning not to be obtained merely by the practice of painting. He doubted if either of these painters would have seen nature just in this peculiar way if they had not been illustrators in black and white first. Literally the power of illustration would mean the highest gift in the artist, because it would not only mean the possession of the power to represent nature truly, but would include the illustration of the man himself. In this way Watts was pre-eminently an illustrator of poetic and abstract ideas, which he repeated in artistic language, thus satisfying the painter as well as the poet. The theory of "self" in art was one little understood, but its potentiality was unmistakable. To be without identity was to be without "self." But they must beware of mistaking this for mere mannerism, which was only a habit of work. That could be carried further into dramatic art. It was Irving's strong theory that people went to see Irving's view of different characters. He (Professor Herkomer) said that was right. A man so to lose himself in a character that he was absolutely somebody else meant that he had not the power to illustrate the subject from his own point of view. It was the illustrator that they wanted, not merely the man who could disguise himself. Irving said "any fool can disguise himself." This particular "self" developed differently in different people, and he maintained that a certain training would, in spite of all natural bias, bring about a somewhat similar result. But no training had left so strong a mark upon the painter as the one pursued by Walker and his followers. It consisted of a transition from the illustrator in black and white to the water-colourist, and from thence to the oil-colour painter. No academical training could give the character to a man's work that was obtained in this way, which practically meant training whilst producing serious work. Therefore, it followed that this school was made up of what the world called "untaught" or self-taught men. Their secret of success lay in "going on" with the subject, with the assistance of nature, until it was right. This same training was followed by Adolph Menzel, whose work was distinctly in accord with the category under discussion. His colour alone differed from English feeling for colour, partly because he had been born and bred in a different atmosphere. He was first a lithographer, then a wood-draughtsman, then he painted in water-colours and finally in oils. There was a danger in taking to the more robust medium last, and he knew to his cost what it took him to become a "comfortable" oil-painter. E. J. Gregory said to this day that he was more comfortable in the use of water-colours. North said the same, although nothing could be more truly an oil-picture, with all the robustness the material was capable of, than the superb landscape of his they had lately added to the permanent collection in the Art Gallery. It would amuse them to know that this very picture was North's first oil-picture, begun twenty years ago, and he (Professor Herkomer) took a little credit upon himself for having forced him to finish it last year. The Walker school had a further invaluable lesson to teach the modern student, namely, it was not fragmentary, it was not empty of subject or of thought, because the aim of these painters was to make a picture of everything they did. This he had from the lips of E. J. Pinwell, and he had it from Walker. These men were the very opposite of clever sketchers.

Whenever they left off in a work, however slight, it was an unfinished picture and not a complete sketch. If there were students there he could not urge this virtue too strongly upon them. And to the art-loving section of his audience he would say this lesson was equally valuable, for they must know the difference between a sketch—which went no further and which could not be carried further—and a work which had set every fibre of the artist's brain in motion. The latter might be done in an apparently slight manner, but there was meaning in it impossible to attain in the other form. Speaking of wood-draftsmen of the present day, he said the age tended towards fragmentary work. The telegraphic form of expression found its way into letters—it was the Triple-Bill Age—which was in such a hurry that it could not read an article of a column in length unless it was divided into innumerable little paragraphs, each with a sensational heading. Here they had two painters whose works were entirely removed from the pressure of haste. In Walker they had the Botticelli of our time, and in North they had a gentle poet who ought always to help them understand the real beauties of English landscape. In Walker they had the modern Renaissance truly exemplified. And surely it was more profitable to see beauty in peasant-life than only its grim and ugly side—its "faceless" side. They might admire to the full the big dignity the French Millet gave his work, but he never once painted the face of a peasant. Strangely enough there was one aspect of nature that brought Walker in one example very near to Millet's self, and that was in *The Mushroom Gatherers*. The treatment of that was directed by the demands of the effect. Having so completely changed his method of work when the subject required it, they could once and for all absolve Walker from mannerism. Another curious and debatable point in Walker's art was his miniaturesque treatment of faces in the midst of more vigorous work. In the larger oil-picture of *The Plough*, the faces of the boy and the man were positively miniatures. Art became sadly interrupted when they saw a picture painted with the same rigid touch from the top of the sky to the edge of the foreground. That was the most modern tendency. Therefore in Walker they might still feel that the faces thus manipulated held their place in the general effect when they looked at the picture from a distance, and on closer inspection their more critical faculties would receive the additional joy in the beauty and finish of any particular face. If this finish interrupted the general effect of the picture it would be wrong, but if its application in no way interfered with breadth it was an additional quality greatly to be admired. In the *Old Gate* could be noted the intense finish produced with the point of the brush in the face of the labourer, yet the top of the hand was roughly done, imperfectly it might be said, and that came near the face. This apparent want of harmony in the workmanship was justifiable from the painter's point of view, because it emphasised that particular grey-day effect, and Walker must have felt this. Never before or since had that effect been more truly represented than in the *Old Gate*. It was painted in the companionship with North; indeed it was North who found him the background which suggested the subject. Touching upon the classical beauty of the male figure, he pointed out that some people suggested that English labourers should not be done like Greek gods. He wished to settle that question of Anglo-Greek gods in disguise once and for all. He would say that the English labourer was as finely built a person of that class as they could find in the whole world, but they must see him without his clothes—they must see him when he was bathing. Without their clothes they were superb, they moved like Greek gods. But put on their clothes and they partook of their sphere of life at once. If therefore the Greek god was under the clothes, Walker was surely justified in showing that fact through the clothes. That was what he complained of in the French Millet—that everything should be so awkward and clumsy. Probably the most complete of the oil-pictures was the *Harbour of Refuge*, now, he was thankful to say, given to the nation by Mr. Agnew. Here they had a superb water-colour drawing of the same subject. The human interest in the picture was full of pathos. There was striking contrast in the figures without, however, the slightest buffoonery. There was an exquisite balance in the composition of the whole picture, and it was absolutely removed from the mere book illustrations. However beautiful *The Vagrants* might be in the National Gallery, he still felt it to partake too much of the black-and-white illustration, done for a certain purpose to a given size. In the *Harbour of Refuge* they had all the training of the illustrator brought into beautiful harmony with the more or less accepted rules of composition. They would note the transition from the use of body-colour to that of pure water-colours. Walker's drawing of *The First Swallow* was thickly painted with Chinese white. It was not a question of the durability nor of the legitimacy—this use of the white—they must judge it from the pictorial side entirely. And here the taste of the artist must be considered. Many tones were producible with white that could not be produced without it. It was a lovely drawing, but if they looked at the distant trees

it would be seen that he had attempted to do a difficult thing in nature with impossible means. He alluded to the light coming through the trees. The dots of white would never give the effect. He must, however, remind them that the use of white generally facilitated drawing, and any one trained in black-and-white work would naturally take to it as a medium of great usefulness. In the *Philip in Church* they could see the use of it. Walker was the founder of a peculiar line in his black-and-white work—a gradated line, fine at the ends and broader often in the centre, mostly done with a brush. From his time to the present there had been three remarkable lines produced by three different men in black-and-white work, viz. Walker's gradated line, Charles Keen's split line, and Phil May's line, for which he could find no name. Phil May had produced a line that had the charm of the finest etched line, yet it was palpably a pen line, but so wondrously used that it was unapproachable, as they could see by the numerous failures of his imitators. Walker's line hardly suggested colour as much as Keen's, but it was robust and eminently picturesque. The three lines should be carefully studied by all students, for they told the history of our times. Finally, he urged them all to become students whilst they had this rare collection before them; not merely allow their taste to guide them, but try and understand what the two remarkable painters intended them to see in nature. Let them, he concluded, be led by the hand, and they would be the happier for the lessons thus gained.

WEDGWOOD AS A POTTER.

THE prizes obtained by the students of the Tunstall School of Art were handed to them by Sir Richard Temple, M.P. In his address he said that, should it appear presumptuous to them that he, a busy politician, should address them on art, he might say that he had himself practised the pictorial art all his life. In addressing them upon art, he recognised the fact that he was standing in one of the great art centres of England and in the very heart of the Potteries, those ceramic institutions that had conducted to the fame of England in the world. He wished to impress upon them that a master potter must of all things be an artist. He must be very much of a chemist, much of a mineralogist, something of a mechanic, something of a botanist, but above and beyond all these things he must be an artist. If he were not, then, in spite of all his great qualifications, scientific and otherwise, he would never be qualified to inherit the conditions of the great master potters of England of the last century; he would never be qualified to be a successor of those who made Worcester, Burslem, Etruria, Sèvres and Dresden what they had been and what they still were. They might be thankful that, despite certain disadvantages, they could produce some of the most splendid specimens of ceramic art to be found in the world—things made not in the last century but to-day. On the previous day he had seen at Worcester specimens of Oriental figures which represented the plastic art in its very highest forms; but of all the artists we ever had in the plastic line in England he placed foremost of all Josiah Wedgwood. That day he had made a pilgrimage to Etruria, and he could understand the veneration which clung to the spot, to the workshops, to the mansion and to the tenements where the great master potter and his colleagues once worked, and where his successors were trying to emulate his work. Wedgwood was an Englishman of the truest type—practical above all things, inquiring, investigating, contemplating, executing, and, though a man of humble education, yet he managed to acquire a degree of taste and culture which had rarely been surpassed in the annals of this country. He gathered round him colleagues who supplemented all those qualities in which he himself was defective. He had the good sense to take Bentley into partnership, while he employed the great artist Flaxman as designer, just as Messrs. Minton now employed their distinguished fellow-citizen, as he might term him, Mr. Solon. And they should remember that had there been no Wedgwood, perhaps we might not have had a Flaxman. It was Wedgwood who sent Flaxman to Rome and sustained him there, who induced Bentley to visit France and sent his own accomplished son on an artistic mission to Germany. And if his Staffordshire friends had sometimes heard it said that Wedgwood himself did not invent and did not design, but entered into the thoughts and labours of others, they should not allow that for a moment to detract from his merits as a whole. After all, it was the genius which collected materials from various sources that gathered up the threads of other men's thoughts, that collected the dry bones of experience and that clothed them with life and animation. When it came to be inquired into, the great plays of Shakespeare and the poems of Homer would be found to be based on well-known legends of the time, and through the whole range of genius, ancient and modern, every individual who had left his mark on the human mind began to collect his materials in the same way as Wedgwood employed his artistic and industrial life. But it was in his power of adaptation of means to the end, of execution

and of administration, of getting things done in a grand, original and purely artistic manner that the great fame of Wedgwood prevailed. If the canons of art as illustrated by Wedgwood appeared to militate against the present practice, they must attribute that not to the potters themselves but to the public taste. He was only lamenting the previous day at Worcester the change which had come over much of the noble porcelain manufacture there, and he was told (and it might be true) that they could make anything, but they had to adapt themselves to the public taste on both sides of the Atlantic. It was clear then that it was the public taste which must be educated. Wedgwood, towards the end of his life, when he was making his work more and more beautiful, found that his most lovely specimens remained on his hands. They would not be taken into the market in consequence of the deficiencies of public opinion and taste. Now, surely the first point in every work of art was that it must be beautiful. That appeared a truism. Were any quite sure that the production of beauty was the object of every work in art, whether in plastic or sculpture, or any other art? He apprehended that very often artists tried to produce something wonderful, thinking of the astonishment they created rather than the emulation they evoked. The first object always before the mind of Wedgwood and men of his class was the production of beauty. If there was to be beauty they must in the first place have breadth and simplicity; these two things were conspicuous in the works of Wedgwood. He (Sir Richard Temple) had his own library, as old as Queen Elizabeth's time, chiefly ornamented with wood-carvings and a few specimens of old Wedgwood ware. These plaques were the admiration of everyone who entered the room. And why? Because there was simplicity of form, breadth of design, and the true gentility of sentiment. The subjects were classical, adapted to the requirements of English art of the last century. But there was that beautiful breadth and simplicity which were always found in the works of great artists, and were rarely found in the works of inferior ones. Were they sure that breadth and simplicity were always preserved in modern works of art? Look abroad in domestic ornamentation—look at architecture on both sides the Channel—was not the form, the outline, the design constantly overlaid by masses of detail, both of form and colour, which might be lovely enough if taken bit by bit, but by which the whole effect was lost when they contemplated the work as a whole? That was the first great canon with regard to which Wedgwood differed from the present generation, and it was for them to say which was right. He did not hesitate to say he was for Wedgwood. There was another great point, which was that the work must have character. A flat surface was level, so was detail level; but they must be co-operative, they could not have all detail or all flat surface. They must have enough of each, so that each should have its separate character. That cardinal point was invariably to be observed in the works of Wedgwood; and he left it to their impartial judgment if they went through Regent Street or Bond Street to say if this was a characteristic observable at the present day. So much for ornamentation. All these qualities that he had mentioned to them came into the general phrase ornamentation. But in this ornamentation there were two main divisions—one of form and one of colour. As regarded form, there must be curving; all fine works of art must have a curve. Ruskin would go so far as to say every line in nature, even comparatively straight lines, appeared to be curved. No man understood this more perfectly than Wedgwood. There was not only the curve, but that swelling proportion which never failed to delight the eye. But when they went to form they had to think of two great divisions—first, the forms of nature; secondly, the human form. As regarded the forms of nature, no one ever observed them more accurately than Wedgwood. As he roamed about Staffordshire and the sylvan environments of that day, he never failed to keep his eye fixed upon the foliage of trees, the petals and leaves of flowers, besides the natural bloom. In his eye there was a sort of dreamy perception of everything lovely in the works in the creation. That was as it should be. Floral decoration took such a part in pottery that a man must be something of a botanist if he was to attain to the highest excellence of plastic art. The potter and the pottery artist worked in two capacities. There were men who only painted; and another gentleman would undertake sculpture; but a master potter must be efficient in both. In that respect no class of artist had to be so comprehensive and world-wide in his thought and capacity as the master potter. In the human form, Wedgwood showed his wonderful perception. His (Sir Richard's) theory was that Wedgwood and men like him perceived that they could not master the human form in action in this humid climate, for the reason that persons were always clothed. No nationality ever acquired the power of the ancient Greeks and Romans in representing human forms. When people knew that their breasts and busts and arms and shoulders were constantly seen, they got into the habit of standing and moving gracefully. They would be surprised if they could see the figures

of the peasant girls of any part of India, because they were uncovered to the waist and held the pitchers above the head. That induced people to move about in that graceful manner, and gave the best models to the sculptor. This was understood by Wedgwood, and therefore he got his best models from Classic times. Now as to colour, there was a quality in colour difficult to describe in words. Nowadays they produced a certain quality in a very simple manner by having all the colours harmonise, because none were anything in particular. A taste was coming into vogue of having all the colours creamy—he would not say wishy-washy, but would call it *impasto*, which meant the same thing. Delicate creams, delicate pinks, imperceptible greens, tender yellows, delicate orange did produce harmony, but that was not the great object of colour, the perception of which Ruskin declared to be the noblest gift of God to man. Colour was splendid, deep, rich. He would not say that was perfectly perceived by Wedgwood, but it was partially perceived by him, and it was nobly perceived by Worcester men of the early part of the century. But Wedgwood did perceive this—that to have a blue they must have a deep blue like the violet blue of the starlit heavens. Besides colour there must be light and shade, and that no doubt came from the variegated surfaces of pottery to a certain extent. Further than this, there was the sense of proportion. If there were a want of proportion, they might have a most graceful outline, the most complete forms, the loveliest details, yet if proportion were wanting the work would be defective, and as the sum total of all these qualities there was this one which artists called composition: that composition was the grouping, so that there might be a pervading effect, a prevailing character throughout the same work. A master potter, to follow in the footsteps of Wedgwood, must understand composition. Lastly, there must be usefulness. Recollect, if they examined the finest works of art in almost all branches in the world, they would find the most beautiful works subserve some useful purpose. He recollected amongst the many admirable things said by Mr. Gladstone, when speaking on Wedgwood, he said Wedgwood's ware was perfectly useful, was convenient, was adapted for practical purposes to a degree unknown to the master potters of that period. There must be a pervading sentiment—a sentiment of beauty, gracefulness, elevation, adaptability, suitability, convenience and usefulness all round. In conclusion, he would say to them, as Staffordshire people, they were living in one of the great art centres of England and of Europe. They were the men and women who by their nimble fingers, their trained eye, their cultivated minds had rendered the name of English potters famous in the world and everywhere victorious against all competitors. That was a great honour, preserved for their children and their children's children by constant study of nature, of all examples which the Creator of the universe had set before their eyes.

ROMAN BOUNDARIES IN BRITAIN.

A PAPER by Dr. Hodgkin on "The Limes Germanicus: Discoveries in Germany as to the Manner of Marking the Roman Boundary," was read at the last monthly meeting of the Newcastle Society of Antiquaries. The author stated that the boundary was concealed from the general observation, and the line of frontier was discoverable at need. Trees were planted to give a general indication of the line of boundary. It remained to be seen what result this discovery in Germany would have on the excavations which he trusted the Newcastle Society of Antiquaries would resume this summer on the Northumberland Roman Wall and Vallum. He quoted from a letter from General von Zarwey, who suggested that a similar boundary should be searched for in Northumberland, and who thought that the society should look for the boundary forward of the southern line (the Vallum?) and to the ditch of the murus. If the hypothesis of Professor Haverfield were right, he (the General) thought that the southern line was the original political limit, and it was probable that this limit was marked out by meerstones. It was difficult to say where these were to be sought—certainly on the northern side of the fosse, perhaps under the mound thrown out on the side. The society would best attain their object by making sections at right angles to the course of the Wall, but he (the General) also thought that they should also extend their researches to the Northern line of Hadrian's Wall. The Newcastle Society would perceive that the great difficulty in reasoning by analogy from the German Limes to their own lay in the existence of the Vallum. If it were the boundary between Roman and Barbarian, Hadrian's Wall, unlike the German Limes, was built upon land lying outside of the strict limits of the Empire. All discussions about the Wall, Dr. Hodgkin said, led them to the external question as to the object of the Vallum. Let them hope that the stout arms of some of the Northumbrian peasants might help to solve this question for them before 1894 expired.—The chairman, Canon Greenwell, said he could not entertain

for a moment the idea that the Roman works in Northumberland were works to show the limit of the Empire. They were works of defence.

TESSERÆ.

Types of Venus.

THE Greek religion was the religion of the imagination, and each of its divinities embraced a poetic conception. Foremost among these was Aphrodite, the representative of purely material life, and whose attributes were consequently selected in this connection, as those of a more subtle and spiritual were grouped around the rare and mysterious Psyche. Out of the flashing foam of the Ægean, the finest expression of its bright and sparkling life, the starry grace of childhood arrested, and united with the winning tenderness of the woman, the blushing Aphrodite comes smilingly forth to greet the hoary Earth. Of all the expressions of this idea which the Greek sculptors have left us, and which are still preserved to us in the Italian galleries, the Venus de Medici is perhaps the most famous. That the figure is very beautiful it is impossible to deny, but as it is a beauty which grows upon the beholder, the first impression in most cases is one of disappointment. Much of its peculiar charm, moreover, is due to its small and delicate proportions. In its fairy-like grace and size it resembles the Undine of the German tale, but it is Undine when she has exchanged the mere lovely infantile instinct for the true woman life, for the complete understanding of the nature she has gained. Upon the whole, however, and to the ordinary student of art, the Venus of the Capitol is perhaps as popular as any—not undeservedly so. An ocean shell is woven into the gathered hair, which in wavy ripples is braided low down upon the brow—"as low as she could wish it," like Octavia's; the face is characterised by a mild, dreamy, refined intelligence, and the attitude, though perfectly feminine, is queenly and impressive. It is not, perhaps, so perfect and elaborate in some of those details of execution to which the scientific anatomist attaches so much importance, but certainly as a charming representation of the rich and perfected beauty of a woman, it is more completely satisfactory than the other. The gathering of the drapery around the feet of the Venus known as the Venus of Praxiteles is remarkably effective; and the sweet, grave, sightless beauty of this stained and mutilated copy yet serves to account for the unrivalled fascination of the Cnidian Aphrodite. Contrasted with the Greek idea of Aphrodite is that of Athena—wise, chaste, severe, inflexible.

Shrines in English Churches.

The shrine of Edward the Confessor, in Westminster Abbey, will serve to illustrate the arrangement of Becket's shrine, and probably those of the other principal saints. It stands, like Becket's, in a chapel, and separated from the choir and high altar by a reredos, but yet not a detached building, as the lady chapels so commonly were. Architecturally speaking, the chapels of Becket and Edward are within the choir at its east end; the pavement in both cases is raised above the level of the choir, and each shrine is a parallelogram on the plan, and stands east and west. The altar is at its west end and in contact with it, so that the saint is placed behind the altar, *retro altare*; and reciprocally, the altar is at "the head of the saint," since the head of a corpse was always laid to the west. These phrases have already occurred in quotations from the monkish chroniclers; for example, in the Saxon cathedral the matutinal altar was placed at the head of Dunstan, and Anselm, Odo, Wilfrid and others were deposited behind altars. On the other hand, in chantry chapels the tomb of the uncanonised founder is commonly at the west of the altar, so that the priest stands at the foot of the tomb. The description of the shrine of St. Cuthbert, at Durham, will also serve to illustrate the two already mentioned. This, too, was placed behind the great reredos of the high altar upon a raised platform enclosed, and forming what was called a "feretory," or chapel for the reception of the feretrum. This platform may still be seen extending partly into the great eastern transept, or "Nine Altars," as it is called. In the midst of it "his sacred shrine was exalted with most curious workmanship of fine and costly green marble, all lined and gilt with gold, having four seats or places convenient underneath the shrine for the pilgrims or lame men setting on their knees to lean and rest on, in the time of their devout offerings and fervent prayers to God and holy St. Cuthbert, for his miraculous relief and succour." Under the shrine of Edward the Confessor there are arches, three on each side, which probably served for a similar purpose. "At the west end of the shrine of St. Cuthbert was a little altar adjoined to it, for mass to be said only on the great and holy feast of St. Cuthbert's Day in Lent. . . . And at this feast, and certain other festival days, in time of Divine service, they were accustomed to draw up the cover of St. Cuthbert's shrine, being of wainscot . . . and a strong rope was fastened thereto, and did run up and down in a pulley under the vault for the

drawing up of the cover; fine sounding silver bells were fastened to the said rope, which at the drawing up of the cover made such a goodly sound that it stirred all the people's hearts within the church," &c. This cover was painted and varnished within and without; and within the feretory, on both north and south sides, there were ambries of fine wainscot for relics.

The Statue of Athena on the Acropolis.

There is enough to show that the Greek was entirely free from modern prejudices, whether for or against decoration by colour. The mingling of stone or marble, or of marbles of different colours, the introduction of metallic ornaments on statuary or works in relief, all subserved this purpose, not less than the employment of polychrome; and even without the use of a single pigment, the sculptor was enabled to produce works not less gorgeous than the painter. Formed of materials altogether more facile and malleable, the chryso-elephantine statue gave (what modern sculpture has not so much as aimed at), the living hues of the human form and the varying tints of embroidered garments. With the most sumptuous of these statues is associated the immortal name of Phidias; but the works themselves have perished. The colossal statue of Athena was plundered of its golden raiment by Lachares, and finally transported by order of Justinian to adorn the Hippodrome of Byzantium, whither that of the Olympian Zeus had been conveyed before. The restoration, therefore, of these statues must depend on the statements of writers like Pausanias, together with any designs on stone or metal which may chance to throw light upon it. At the Paris Exposition of 1855 was exhibited a restoration of the Athena of Phidias (on a smaller scale) by M. Simart, who had chiefly followed the Vienna stone with the name of Aspasius subscribed. This remarkable work was executed at the cost of the Duc de Luynes, whose liberal patronage and exquisite taste suggested this revival of one of the most famous works of antiquity. In spite, however, of the vast expenditure lavished on this chryso-elephantine statue, the effect it produced was scarcely equal to the idea generally conceived of the Athenian goddess; and a controversy arose as to the accuracy of the representation. From the expressions of Pausanias M. Beulé inferred a complete absence of all ornamentation, except on those parts of the statue which were nearest to the spectator, thus confirming his own theory of the uniform simplicity and extreme severity of the art of Phidias. The contrary ideal furnished by the sculptured stone of Aspasius he rejected on the ground that the lunated sigma, in the inscription, was not employed in Greece till the second century of the Christian era, and the work was therefore not produced in the golden age of Greek art. M. de Calonne asserted that the name may possibly be the forgery of a later age, and he produced several inscriptions to prove that the lunated sigma occurs as early as a century and a half before the Christian era, and that it was not a Roman introduction. If then the Vienna stone represents the Athena of the Parthenon, it must belong to the best epoch of art, because it must have been executed before the statue of Phidias was robbed of its ornaments; and if it be of that epoch, can it possibly represent any other type than that which Phidias evoked, and which was everywhere regarded as a miracle of beauty? But the ideal set forth in this stone is that of extreme richness over the whole figure; and, after all, the expressions of Pausanias scarcely justify M. Beulé in using them as negative arguments. Because Pausanias says nothing of the crest of her helmet, of a collar or earrings, are we to deny that they were found on the statue of Phidias? Nor has M. Beulé less exposed his weakness in maintaining that the Medusa of the shield was represented as a monster only in the decay of art, while that of Phidias was "a beautiful young girl with dying eyes and immobile lips." If this be so, Attic art in the days of Pericles grievously violated all the traditions of earlier ages. The glaring eyes of a maiden lovely even in death can never be the sight which could appal the warrior amid the din of battle, or freeze a living man into stone.

Verulam House.

When Chancellor, Bacon had built a summer-house about a mile from St. Albans, near the famous Byzantine ponds. The Gothic pile enlarged by Sir Nicholas for Lady Anne, which had come into his possession on his brother's death, stood high and dry above the water, and as the stream would not flow up to his house, he took his house down to the stream. Avenues of stately trees sloped from the hall door to the little lakes, which, four or five acres in extent, were kept bright as crystal, filled with brilliant fish and paved with pebbles of various hues. On the bank of one of these lakelets he had built Verulam House, a tiny but enchanted palace, one front leaning on the water, the other glancing, under oak and elm, up the long leafy arcade to his mother's house. This place was furnished and complete. The larders and kitchens were underground; through the centre of the block ran a staircase delicately carved; on the rests and landings a series of figures—a bishop, a friar, a king, and the like, not one repeated either in idea or

in execution; on the door of the upper storey statues of Jupiter, Apollo and the round of gods. Beauty and luxury combined were chimneypieces prettily wrought, rooms lofty and wainscotted, baths, oratories, divans. Shafts from the chimneys ran round the rooms, with cushions on these shafts, so as to garner up the heat. The roof, which was flat and leaded in the Eastern manner, commanded views of wood and water, plain and upland, with the square plain Saxon tower of St. Albans Abbey high above all. In the centre pond rose a Roman temple or banqueting-room, paved with black and white marble. One of the doors had a device of mirrors, so that a stranger fancied he was looking into the gardens when the door was closed.

The Perspective Process.

On first learning the meaning of a picture, it would naturally strike the mind that a sure and easy method of carrying any point from its position in space to its position in the picture would give any one the power of drawing the outline required. Such a process might be laborious, but it would put the whole design within possible reach. This method would be an excellent one for learners to begin with, previously to entering on the use of vanishing points; it would be something like learning to count with pebbles before entering on the common rules of arithmetic. Even without diagrams it may be possible to give such a description of the process as will enable some who have never attempted anything before to put a few simple figures into perspective. Let the picture plane, which suppose transparent, be spread out before the spectator, reaching down to the ground, and bounded on the right by a side-wall, which extends both before and behind it. Every point which is to be drawn has a point directly below it on the ground, which call its ground-point; and a point directly opposite on the side-wall, which call its side-point. All the ground-points make, when properly joined, what the architect calls a plan; all the side-points an elevation. The picture would be called a section if points were taken on it opposite to the points to be represented; instead of this a point is carried to its place on the picture along a line drawn to a certain point in front of the picture, which represents the eye of the spectator. This eye-point has also its ground-point and its side-point. The picture has its ground-line and its side-line, and every point in the picture has its ground-point upon the ground-line and its side-point upon the side-line. A picture-point is known when we know where the ground-point is by its distance from the side-line, and where the side-point is by its distance from the ground-line. To lay down a given point on the picture, draw a line from its ground-point to the ground-point of the eye; that line meets the ground-line of the picture in the ground-point of the picture-point required. In the last sentence for ground read side, and we see how to find the side-point of the picture-point in the side-line of the picture. Two lines being drawn on a paper perpendicular to one another, the right side of the paper may represent the side-wall laid flat on the ground by turning round its ground-line, and the left side may represent the ground-plane. The two sides of the line which separates the upper part of the paper from the lower represent the ground-line and side-line of the picture. Take another paper, or another part of the same paper, draw two perpendicular lines, lay down the ground and side picture-points by taking their distances from the paper on which they have been found, and the points of the picture may at once be put in their places. This is an explanation of the principle of a picture and an exhibition of a sufficient method of construction; that is, of sufficient power, but not of sufficient facility; every point requires the drawing of three lines.

Florentine Portraiture.

The people of Florence, devoted to commerce, had been steadily advancing in wealth and importance; the arts were patronised by her chief merchants, not for mere historic association, but for the benefit and gratification which they so readily afford to those who best cultivate them. They were thus enabled to honour the memory and perpetuate the personal appearance of their most illustrious citizens. Hence portraiture, an important and comparatively a novel feature in modern Italian art, attained an especial preference among the Florentines. The dramatic and thoroughly independent tendency of Giotto's conceptions illustrates this. Dante, Petrarck, Boccaccio, Cimabue, Donati, Brunetto Latini, Bettino di Bardi, Dello and Michelozzo were only a few of the distinguished persons depicted by the earlier Tuscan artists. This natural desire to honour great men nurtured the faculty of imitation, and attained at last so wonderful an approximation to reality that this very power took afterwards a somewhat pernicious tendency. Not that accuracy of imitation could in itself be injurious, but danger arose from the painter's liability to make a successful imitation the sole end and object of his work. Hence, not merely in pictures belonging to the second half of the fifteenth century, and professedly of a strictly religious

tendency, might the features of a well-known living person be recognised, but occasionally the lineaments also of those whose morals were frequently questionable; thus the serious impressiveness of the picture would be impaired, and the work deprived of that devotional character which ought to have pervaded it. By too implicitly copying the realities of everyday life, the very action, or as the Germans would say, the motives of the picture are radically disturbed, and simpering Madonnas, angels in extravagant attitudes, and martyrs looking to the spectator, in consciousness of his presence, for sympathy, are only one small portion of the mischiefs which may be traced from the perverted use—not only in painting but in sculpture also—of servile imitation.

Modern Architecture.

In all countries of the world down nearly to the present day, and in Europe down to the sixteenth century, architecture continued to be practised, and everywhere with success, on the same principles as in all ages governed, and do still govern, the development of all the sister useful or technic arts. At the Reformation a new and extraneous principle of imitation was superadded, and for the last three centuries we have been labouring under the delusion that it was neither science that advanced the art nor truth that rendered its production pleasing, but some strange notion that it would be beautiful if it could only be made to look like something it was not, or had only some very slender connection with. What is now wanted to restore the art to its pristine pre-eminence is a return to those simple principles which guided the architects of Egypt, India, Greece, Rome or the Middle Ages, and which are identical with those that now guide our shipbuilders or machine or engine makers, or the engineers who construct our bridges or our forts. There is absolutely no mystery about it. All that is required is strict and undivided attention, first, to convenience, next to constructive necessities, then to the ornamental or harmonious arrangement of the parts, and lastly, when it can be done, to their ornamentation. It may require more thought and self-negation to succeed by this path in the present state of the art than by following the fashion of servile copying; but by the one path certain success may be easily and permanently obtained by even the most moderate abilities, while by the other path no genius will enable any man to erect a building which will be considered successful many years after its completion. This may appear a daring assertion, but it is justified by the experience of 4,000 years, during which the first path was followed by all the nations of the earth with uniform success, and by the experience of the last 400 years, during which the other process has been cultivated, and anyone is able to judge how far during it men have succeeded in attaining what they sought for. Taking into consideration the amount of money spent, the amount of talent employed and the amount of knowledge available, the result has been the most complete and lamentable failure in the artistic history of the world.

Volume in Art.

It has long been said that in nature nothing is absolutely small, nothing is absolutely large; but whenever we see a new object we are led to compare it with that which we know to be analogous to it, and it is then large, if its size or volume markedly exceeds that of the object with which we compare it; volume becomes a property which strikes us in proportion to that difference. Of two statues or two busts representing the same model but differing in size, the largest, though of equal merit, will strike us more than the other. But we must not omit to remark that if we are accustomed for a certain time to see only statues and busts which both surpass the human proportions, then the influence of volume loses its force; and moreover, it may happen that after having seen many of these works, constructed so to speak on the same colossal scale, and having less merit than the work that struck us at first, we should be disposed to recur to figures life-size. But if the volume of an object has undoubted influence in striking spectators forcibly, we must never forget the inconveniences that result from exaggerating a single object which ought to be associated with others; for in this case the exaggeration may have the serious objection of lessening these latter, and thus breaking the harmony they would otherwise possess.

The "Standard" Correspondent in Athens announces that the French excavating party at Delphi have discovered a fine head of an ancient statue of *Apollo* belonging to the classical period. Several interesting inscriptions have also been found on various antique bronze objects, which are in a good state of preservation. The American School of Archaeology in Athens has solicited permission from the Government to excavate the foot of the lower parts of the North Acropolis, and is prepared to spend half a million francs for this purpose.

NOTES AND COMMENTS.

THE difficulty which often arises about fixing responsibility on landed proprietors for negligence was exemplified a few days ago at a coroner's inquest held in Wavertree, Liverpool. A slater who was walking along an open pathway in the evening diverged from it in the dark, and, falling into an unprotected quarry about 80 feet deep, was killed. At the inquest one of the solicitors for the Heathfield estate stated that his firm, as representatives of the owners, were ordered by the local board to build a wall at the point where the accident had occurred. They appealed against the decision, and on March 21 Mr. Justice CAVE decided the case in their favour, and the order was quashed. It was pointed out to his lordship that the owner of the quarry could not fence the place, as he had no land to build upon, whereupon his lordship said that if the local board could not find a proper responsible person to do it they would have to remedy the defect themselves. The clerk to the Wavertree Local Board said that they had no right to build a wall at this place, as the land on which it would have to be erected belongs to the Heathfield estate, and they would be trespassing. The coroner said it was really disgraceful to leave the place in such a condition. It seemed to him that the owners of the land could not be called upon to build the wall unless it was proved that there was some obligation made as to fencing. They might summon the lord of the manor, the Marquis of SALISBURY. It seemed to him, from the reading of the Quarries Act of 1875, that the quarry was a nuisance, as it was within fifty yards of a public highway, and it was not fenced, and therefore the owner of the quarry ought apparently to be liable. The clerk asked how this could be done, as the owner of the quarry had no land to build the wall upon. A fence at the bottom of the quarry would not be of any use. The coroner said it was desirable to do something at once. The owners of the land, the owner of the quarry, and the local board might come to some arrangement and contribute equally to the cost of the work. The jury returned a verdict of accidental death, adding that proceedings ought to be taken for the erection of some barrier by the responsible persons.

THE statue of JOHN HOWARD which has been erected in Bedford is not, of course, the first representation of the prison reformer. There is another by BACON in St. Paul's. HOWARD, if he desired, might have had his statue during his lifetime. When he was suffering from fever in a Turkish lazaretto he received the news that subscriptions were being raised to pay for a memorial of that kind. As soon as he returned to England he lost no time in publicly announcing his repugnance to the proposal. The money obtained for the statue was returned to the subscribers, some of whom expended their shares in the liberation of poor debtors from gaol. HOWARD died in Cherson among the Tartars in 1790. When the intelligence was received the project of a statue was immediately revived. Opportunity was taken of the occasion by the Marquis of LANSDOWNE to offer suggestions about public monuments. His proposals were:—1. To reserve St. Paul's, the second building in Europe and the first in Great Britain, from being disfigured or misapplied in the manner of Westminster Abbey. 2. To assist the arts most essentially by advancing statuary, which may be considered as the first, because it is the most durable among them. 3. To commence a selection of characters, which can alone answer the purpose of rewarding past or exciting future virtues, and the want of which selection makes a public monument scarcely any compliment. The selection might be made subject, in the first instance:—1. To the King's Sign Manual. 2. The vote of either House of Parliament. 3. The vote of the East India Company. 4. The ballot of the Royal Society. 5. The sense of any profession, taken under such regulations as may be deemed most unexceptionable. 6. The same as to artists, men of letters, or other descriptions, subject to proper regulations. The subscription and the vote must be a sufficient check upon all the latter description. Upon the same reasoning, some spot might be reserved for eminent foreigners, who are very properly, while living, associated to the Royal Society and

other learned bodies. But none ought to be admitted in consequence of the wish or sole opinion of families or individuals. It might, perhaps, be thought proper to leave it to the Royal Academy to form a general plan, and they might class the several descriptions, allotting places to each." It is probable that the restrictions adopted by the Dean and Chapter were due to Lord LANSDOWNE's recommendations. Although opinions may differ about the fitness of some of the statues, it must be acknowledged that in St. Paul's there is an absence of the memorials of nonentities which disfigure the walls of Westminster Abbey, and which, sooner or later, may cause the building to be transformed, in order that similar hospitality can be exercised by the authorities.

IT will be observed from the copy printed on another page that the rules of the Education Office do not correspond with those issued last year. The system of teaching has become an important factor, and it is no longer sufficient to mention the number of children for whom accommodation is to be provided. It is recommended that "before instructing an architect, the teaching staff of a school should be well considered, so that the number of rooms and the accommodation of each may be approximately settled before the expense of building is incurred." A normal class-room is one which is "wide enough to allow the teacher to stand at such a convenient distance from the front row of desks that he can command the whole class; and, on the other hand, only so wide that his voice may reach the scholars in the back row distinctly without undue strain." Four rows of long desks and five rows of dual desks are sufficient. If only one class is taught in a room the depth of the class may be increased. In large schools more than one entrance to each department is considered desirable instead of one to each school. Every part and corner of a school is now to be fully lighted, and it is added that "large spaces between the window-heads and the ceiling are productive of foul rooms." By a new rule "windows should be carried up as nearly to the ceiling as possible." As regards ventilation, it is prescribed that "an outlet should have motive power by heat or exhaust." The allowance for outlets is to be $1\frac{1}{2}$ superficial inches per child, and rather more for inlets. For passages or corridors used by boys or girls there must be complete supervision from class-rooms by sheets of clear glass. Where cesspools and privies have to be used, they must be at least 20 feet from the school, and the proximity of drinking-wells is to be carefully avoided. A covered marching ground is considered to be desirable in the playground. An open fire was required in the infants' room, but now it can be warmed in another way provided the temperature is maintained at about 65 degrees. A bonnet room will have to be provided near the cookery class-room.

THE investigations of the Vicomte G. d'AVENAL have produced several remarkable facts about the variations in the value of land in Paris. It appears that in 1380 the Hôtel Dieu possessed a field which extended from about the Rue Chaussée d'Antin to the Rue Scribe. The Opera House, Grand Hôtel and Vaudeville Theatre are now upon it. At that time the rent was 200 francs a year. In 1399 the rent had fallen to 135 francs, and in 1472 to 37 francs. In 1533 the rent was 39 francs, but the area had been increased by another piece of land which extended to the Madeleine, the whole property comprising an area of four acres. As the annual value was only about forty francs, the property at fifteen years' purchase would be worth 600 francs. In 1552 the value was 1,900 francs. Two hundred years afterwards the value rose to 25,400 francs; in 1767 it was 64,000 francs, and in 1775 it became 260,000 francs. The ground which in the time of FRANCIS I. was let at 40 francs is to-day worth more than forty millions of francs. The increase has been as 1 : 66,666. It is not to be supposed that in all Paris a corresponding variation of value could be traced. In the sixteenth century the field was in the country; to-day it is the centre of Paris life, to which strangers no less than natives are attracted.





INK PHOTO SPRAGUE & CO. 4 & 3 EAST HARDING STREET FETTER LANE E.C.

FIGURE FROM ALTAR-PIECE,
CHURCH OF OUR LADY AND ALL SAINTS, STOURBRIDGE.
Painted by L. FAIRFAX MUCKLEY.



PHOTOGRAPHED BY BEDFORD LEMERE & CO

"MENTMORE," BEDS.:
The Seat of the EARL
H. STOKES.

April 6th 1894.



IN A PHOTO SPRADUE & CO 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

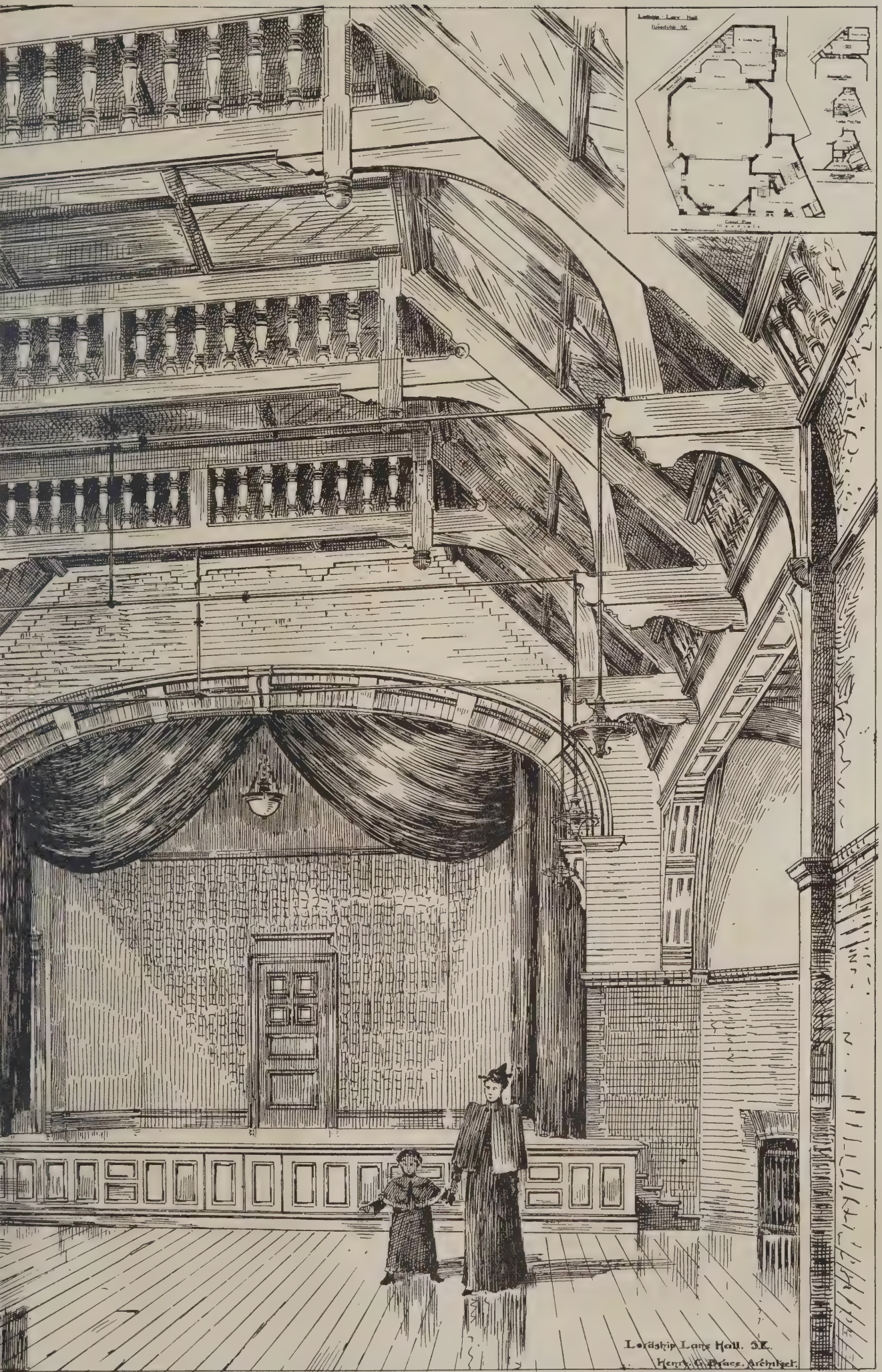
FROM THE GARDENS

OF ROSEBERY, K.G.

Architect.



April 6th 1894.



Lordship Lane Hall, S.E.
Henry C. Peach, Architect.

Printed by J. & J. G. Evans, 2, Fleet Street, London E.C.

ILLUSTRATIONS.

FIGURE FROM ALTAR-PIECE, STOURBRIDGE.

WE give to-day another figure from Mr. L. FAIRFAX-MÜCKLEY'S wall decoration in a Stourbridge church. It will be observed that the type adopted differs from that of the figure published last week, but is no less suitable for the subject.

MENTMORE, BEDS., FROM THE GARDENS.

LORDSHIP LANE HALL, S.E.

THIS hall provides seating accommodation for about 370 people, and has cost 3,500/. By means of colours effect has been gained which cannot be suggested in the drawing. Luton bricks with red dressings have been used for the dado, malms above bays only being finished in plaster-work. The object of the two levels for the floor was to fit the hall for use for private purposes, the top floor being for refreshments and a lounge, the lower for dancing, and in this it has been found particularly successful, as also that the finish gives a warm and furnished appearance, without special decoration. The architect is Mr. H. G. BRACE.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. A. W. Earle, member of the committee, in the chair.

London Streets and Buildings Bill, 1894.

Mr. F. T. W. GOLDSMITH, hon. secretary, introduced the subject by reading the petition of the Association against the Bill, and also notes on the subject, which were as follows:—

These few notes, hastily put together at the suggestion of our worthy President, are limited principally to the various amendments and additions to the Bill which appeared in the report of the general committee to the London County Council, and subsequently in the petition of the Association against the Bill now before Parliament. When I explain that these notes were written during the Easter holidays, and at very short notice, I feel sure I shall have an indulgent audience, and one that will be kindly disposed to the many defects discernible throughout these notes. They are to be taken as illustrative of the work done by the special sub-committee appointed to consider and report on this measure.

The London County Council forwarded copies of the Bill to the Association, with a request that we should consider and report to them upon it, not with regard to the principles of the Bill, but more particularly with reference to amendments to the text.

What the sub-committee did was to deal with such parts of the Bill as were distinctly structural and involving serious amendments and alterations to property within the sphere of the Bill.

The Architectural Association is, I believe, the only Society that has petitioned against the carrying up of the party wall above the roofs of buildings of the dwelling-house class. Mr. Carøe's letter to *Architectural Association Notes* this month will have brought this before the notice of members, and the views expressed in his letter have been duly set forth in our petition against the Bill.

The general grounds of opposition to the Bill, as stated in the petition, are that it "contains clauses which would be impracticable and inoperative, and in many instances the operation of the Bill would involve great loss to owners in the Metropolis, without any compensation to them or resultant benefit to the community in general"; further, that the provisions of the Bill injuriously affect the recognised rights, interests and privileges of the petitioners.

The petition then enumerates the main defects of the Bill, as already reported to the London County Council. These I propose to give—omitting only some minor amendments to the text—in the order found in the report and petition, adding a few remarks on the suggested alterations. Amongst numerous undesirable provisions to be found in the Bill are the frequent references to the option of the Council. These permits should not be allowed; nor, indeed, should they be necessary in a measure of this kind. If any references are to be made, let them be to the new tribunal of appeal; those to the County Council, which are so plentifully scattered throughout the Bill, should be eliminated. That is the first recommendation. This tribunal of appeal should commend itself to the favour of us as architects, though perhaps we would welcome an addition to the architectural and artistic element on the tribunal, even though it were at the cost of the existing preponderating officialism.

Part I., section 13, may be taken as a sample of a confiscatory clause—there are many such in the body of the Bill—where, if a fire were to occur in a building, the owner of such building would not only be a loser by the casualty, but would be a sufferer in having to set his building back to the line of frontage

required by the Council. Section 14 might be considered confiscatory.

Part II., section 15.—Where buildings are situated on corner sites this section should only apply to a new site.

Section 17.—This clause should be put at the end of Part II., and made to apply to the whole part.

Part IV.—This has been the great battle-ground of advocates and opponents of the Bill, and it is probable—if the Bill should ever be referred to a committee for serious consideration—that on the sections of this part there will be some good hard hitting. The general opinion is that, as drafted, the part is absolutely impracticable, and that it must go root and branch. "There are," our report states, "serious objections to the whole part. It is quite unworkable in its present form, and should be entirely remodelled."

Part V.—The rules in section 39 should be definite, not subject to any alterations or by-laws. Here follow certain verbal amendments to the text which I will not trouble you with. There is one alteration, however, which is important; it is in section 43, where after "as follows" is added, "or such other scantlings as may be approved by the district surveyor." Attention is called to the obscurity of section 45. Under this section, apparently, a person might, by surreptitiously erecting a water-closet or other small building against his neighbour's wall, actually convert the whole into a party-wall.

All chimneys should be corbelled only above the ground floor, for chimneys corbelled in accordance with this section would cause the walls to overhang.

Now we have arrived at a truly burning question. Should the party walls of dwelling-houses be carried up above the level of the roof? Mr. Carøe has been kind enough to hand me a paper he has prepared on this and other points, with a request that I would read it at this meeting, which I propose to do.

It is proposed to insert after section 45 the following words:—"Every party wall of any new building, being a dwelling-house (as hereafter defined), and every party wall of any such old building shall be carried up to the roof of such building throughout the entire length of such wall, and the slates or other roof-covering shall be properly and solidly bedded in mortar or cement upon the top of the wall, and the roof shall be so constructed that no timber or woodwork of any description shall extend upon or across any such wall."

And section 46 of Part V. should read as follows:—"Every party wall of any building of the warehouse class, or of any public building, or building used wholly or principally for purposes of trade, shall be carried up above the roof flat or gutter of the highest building adjoining thereto to such height as will give a distance (in a building of the warehouse class) of at least 3 feet 6 inches, and (in any other building as referred to in this sub-section) of 15 inches above the highest part of any flat or gutter, as the case may be."

Of the artistic gain to London streets and terraces, if these clauses were adopted, there can be no doubt. Mr. Carøe is prepared with evidence on the practical question of protection from fire, and does not rest his contention for this change on any fanciful or sentimental grounds. I now propose to read the amendments suggested in the report and petition from section 50 to section 60, which I would specially mention:—

Section 50.—(6) Add "render" outside of flues where brickwork is less than 8½ inches in thickness, except where it forms external enclosure of the building.

Section 50.—(10) "Mantel" to be altered to "lintel" or "arch."

Section 50.—(15) Alter to "6 inches wider on either side than the width of the opening."

Section 50.—(22) Add "no iron girder to be placed nearer than 4 inches to the inside of any flue."

Section 51.—Add new section "that perforated iron cresting at the top of chimney-shafts should not be allowed," as iron decays and is difficult to repair.

Section 52.—(5) Define "low pressure."

Section 53 should be redrafted. It is not comprehensible at present.

Section 55.—(b) 7 feet 6 inches instead of 8 feet 6 inches.

Section 55.—(d) Impracticable and impossible throughout.

Section 55 (f), line 15.—After "floor" add "except when constructed of fireproof materials."

Section 55 (f), line 16.—Add after "quality" or "fibrous plaster of a good quality."

Section 56.—Add "window or" and "skylight or" before "windows" and "skylights."

Section 57.—After "10 feet" add "except the lift in wells of staircases."

Section 58.—(1) Rise of arch should be stated, minimum 1 inch to the foot.

Section 60.—(2) I will not ask you to picture to yourselves London as it would look if every cornice—however deep or what its position—were limited to the projection prescribed by this section.

It is proposed to omit clause b in section 60 altogether, and

in section 61 after "materials" (line 8) to add, "and separate sets of offices tenanted by or constructed, or adapted to be tenanted by different persons, shall, if contained in a building exceeding 25 squares in area, be separated from each other where they adjoin horizontally by proper party structures or arches of fire-resisting materials."

Section 64 is slightly amended, but section 65 (4) and (5) the term reported would be wholly inoperative.

Part VII.—Section 72 (3) is ambiguous, and sub-section (6) unfair to the adjoining owner. The building owner could put footings to his new wall into the adjoining owner's room, if on that level. This the latter might reasonably object to, and it is proposed that after "owner" (line 21) should be added "below the level of the lowest floor line."

There would seem to be nothing in this Bill binding the building owner to pay for any necessary underpinning or other works to the adjoining wall. Section 75 deals with the "exercise of rights by building and adjoining owners," and the appointment of surveyors in case of disputes arising. The report states that the arrangements made under the 1855 Building Act have been found to work well, and there is no need to alter such arrangements as is suggested to be done by this section of the "London Streets and Buildings Bill, 1894."

Section 80 is slightly altered, being amended to include underpinning and the cost of doing the same.

The sub-committee would not have section 184 at any price, and the report and petition contain this clause as redrafted by the committee. In its amended form it reads, "With the exceptions mentioned in this Act, this Act shall apply to all new buildings. Any alteration, addition, or structural reinstatement made or done for any purpose except that of necessary repair not affecting the construction of any external or party wall, or to which the rules and regulations of this Act are inapplicable, in, to, or upon any old building, or in, to, or upon any new building after the roof has been covered in, shall, to the extent of such alteration, addition, or work, be subject to the regulations of this Act; and whenever mention is hereinafter made of any alteration, addition, or work in, to, or upon any building, it shall, unless the contrary appears from the context, be deemed to imply an alteration, addition, or work to which this Act applies."

The petition concludes with the customary formal clauses that the Bill should not be read a second time, but that if it is to proceed, it ought to be referred to a committee of the House, and that the petitioners should be heard before such committee by their counsel, agents, and witnesses against the principle and details of the measure. If the Bill be read a second time, the petitioners pray that it may be referred to a committee of the House, as before, with counsel, &c., and that such other relief may be afforded to them (the petitioners) in the premises as to the House may seem meet. The petition was signed by the President, two Vice-Presidents and the hon. secretaries, and duly delivered through the Parliamentary agents of the Royal Institute of British Architects to the officials of the House of Commons.

Mr. Goldsmith then read the following criticisms on the Bill by Mr. D. W. Caröe:—

We, gentlemen, are an Association engaged in the study and practice of architecture, and I would venture to invite you to give this Bill your consideration from the architect's point of view, and in this light I will name a few points.

First and foremost, we should set our faces against clauses which retain special consents to the Council, except with the greatest reservation and in cases of absolute necessity. The power of consent fosters officialism. That is quite enough to condemn its operation.

Secondly, we should oppose all clauses which will operate in exactly the opposite direction to their intention; that is to say, clauses which will conduce to the undue preservation of worn-out buildings, and militate against improvements through fear of confiscation and interference. Likewise clauses which would tend to encourage underground building, as Mr. Woodthorpe has here pointed out.

Thirdly, all clauses likely to interfere unreasonably with freedom in design, or which make, or tend to make, architecture stereotyped, should have our vigorous opposition.

Fourthly, we should remember that a Building Act should not make architecture unnecessarily costly; that the poor man's house has to be cheap as well as effective, and good for its purpose; and that no matter how costly a building be, we can (or ought) never to afford to spend money upon silly fads, or fictions, or prejudices, even for the imaginary benefits of insurance companies.

Mr. Roberts, of the County Council, in this room told us that the new Bill had for its object "the revival of building of a higher standard than had been maintained in the past."

Now the County Council's idea of such a perfect London constructed up to a high standard of building (or architecture, I suppose Mr. Roberts meant) seems to be a London of two storeys and one in the roof—so far as the Council can make it so.

If you will take an ordnance map and set up new buildings limited as proposed upon the sites in any quarter where London is rich and busy, you will see how just this estimate is of the application of Part IV. to new buildings on old sites. Can it be that the County Council has learnt to love the beautifully ornamented productions of the jerry-builders in the suburbs, erected in the genuine vernacular of their craft, and wishes to see all London cast to the same model?

You may, perhaps, be surprised to learn that the "shaving clause," so well called by Mr. Tavenor Perry—I think invented originally by the Local Government Board—has been, in a modified form, in operation in the city of Liverpool since 1890. But Liverpool has guarded itself to some extent. The rule applies there only to dwelling-houses, so that buildings devoted to office and such like purposes are exempt from its operation, while proper sanitary provision is made for residential caretakers. Now this is very different to the proposal of the County Council, but it must be borne in mind that what operates well in Liverpool or other provincial towns in such a matter will not necessarily apply to London, which is mixed, as to the character of its buildings in juxtaposition, as probably no other city in England is. Bearing in mind, also, that a tall building may make an otherwise perfectly sanitary small one too close to it quite unfit for habitation, it is not certain that the Liverpool by-law is the best, from its framers' own point of view. It is interesting to know that already there is a proposal in Liverpool head official quarters to modify the rule, by allowing buildings consisting of shops or offices on the ground floor and dwelling-houses over to be more leniently dealt with. It is suggested to allow the shops to cover the whole site, with a flat and skylight at back, and the limiting angle to be measured from the back of the flat at the first floor level. In urging some such recommendation for the Metropolis I would, however, press for a small but reasonable area, perhaps proportionate to the site, being insisted upon to light and ventilate the basement. Now I am happy to be able to state to you that the County Council have followed to some extent the lead of Liverpool. In the printed amendments to the Bill the shaving clause in all its rigour is to apply only to new domestic buildings in new streets. New clauses are introduced to apply to new domestic buildings in old streets. Briefly stated, these determine the height by making it twice the base, or, in other words, the angle is to be 63° 20' instead of 45° measured as before. Dwelling-houses having an area of less than six squares, and dwelling-houses to be occupied by more than two families, which are not on the public way, are dealt with by special provisions, and the height of warehouses is regulated when in close proximity to such dwelling-houses. Old buildings are not to offend against the provisions regulating new buildings in old streets more than they do at present. So far, let us be thankful; but in considering even these amendments there are two aspects of the question which must not be overlooked. By lack of sufficient space and air within it, as well as by lack of space without and around it, a building may become insanitary, and this especially applies to those buildings which are not, but ought to be, specifically defined in the Bill, and specially provided for, viz. buildings erected and used chiefly for purposes of trade or commerce, and which, therefore, are occupied during the day by a large number of *employés*. If the air around such a building be somewhat confined, it will still be fresher than the air inside an overcrowded building surrounded by the freshest air.

I mention this point specially in connection with the proposal to allow shops to cover most of the site as one deserving much consideration, as an antidote to any too drastic laws, framed for the admitted importance of getting rid and preventing the erection of rookeries, but applicable unduly to buildings of quite a different character.

The decrease of habitable space proposed under the operation of the Bill—even as amended—means, necessarily, the increase of the borders of the City. One may well ask where the fresh breezes are to blow from which are to keep the centre of the City in health, if still greater spur than exists already be given to its spreading out into the surrounding country.

Finally, in this connection I would protest on the score of sound construction, of dignity in architecture, and of breadth of design in our new streets, which (when the County Council has swallowed the lollipop of betterment) we hope may be many, against any rule which has any angular measurement for its chief factor, and which would cut our new buildings into fragments of all heights and shapes, and tend to create a city of wedges, the thin end always uppermost striving to insert itself into the disabilities forced upon us by Part IV. of the Act.

With regard to general architectural considerations, a clause is required which will allow houses with their offices, stables, lodges, &c., in the suburbs to rank as one. Although each of these may happen now to be removed 30 feet or 60 feet from adjoining property, as the case may be, they may be within the specified distance of one another, and thus the disabling provisions of the Building Act come into force where never intended.

In all cases, provided an adequate architrave of incom-

bustible material is used, with a definite projection say of 3 inches, timbers in window openings should be permitted out to the wall face. The present Building Act was regulated to suit the exigencies of the stucco Victorian era of Classical or Renaissance architecture, in which the detestable window reveal was desired. To secure it, perhaps, a sham fire scare was created, or may be its originator held a brief from the insurance companies, and got them, like Mr. Hall, to threaten increased premiums to further his wicked architectural ends.

I might tell you that Mr. Hall introduced me to one of his insurance companions, to whose blandishments he expected me, no doubt, to fall as ready a prey as he himself had done. I bowled that gentleman out, however, in the space of something less than a minute, found that he was not fully aware what a party-wall parapet was, had never considered its existence, and he also informed me that "fires did spread sometimes through defective party walls." That I could have taught him, and for that reason and others I have advocated the admirable Liverpool system of separate side walls.

Serious injury will be done to design if a Mansard roof cannot have a steeper angle than the 75 deg. proposed; 83 deg. at least should be possible. Grave interference will accrue to certain forms of plans necessary, on confined sites, by the operation of the sub-section dealing with light and air in the wells of houses. The clause relating to the enclosure of lifts, which is amended so as to permit of lifts in wells of staircases, requires still further amendment.

One would like to see clauses introduced for the encouragement both of reasonable projections and gables in street fronts. Moreover, under given conditions, the clause that one wall may not overhang another should be inoperative if the construction can be carried out to the satisfaction of the district surveyor. The advantage and importance in design of having limited freedom, even to a few inches, will come home to all of you. The limitations as to cornices should be amended. The projection should be measured from the wall face, and should be allowed to vary with the width of street, so as to thus allow setting back if a great projection is required by the designer.

After the reading of the papers, remarks were made by Messrs. Collard, Brodie, Beale and Banister Fletcher.

A vote of thanks having been passed to Mr. Goldsmith, the meeting, which was practically held before empty benches, terminated.

TECHNICAL MUSEUMS AND SANITATION.*

I PROPOSE with your permission to deal rather briefly with my subject this afternoon, for two reasons: first, the notice I had from your excellent secretary was somewhat short, and, since I received his intimation, my time has been unfortunately very fully occupied with business matters. My notes are therefore necessarily of a limited character, in fact, they were non-existent forty-eight hours ago, for which I feel that I owe you an apology. There is, however, another reason why my paper should be short, viz. that I propose to throw out a few suggestions in the hope that they may be productive of discussion, as I consider that an interchange of views on a matter which has not yet met with much public attention will be of value.

The subject I have been asked to consider with you this afternoon is, "The Advantages of Technical Museums in Advancing Sanitation." The word "sanitation" has a wide meaning, but I will refer to it in its more restricted sense. I may, perhaps, define it, for our present purpose, in the following manner. Firstly, domestic hygiene, including food, clothing, warming, lighting, ventilation, cleanliness and the proper use of water and drainage fittings; with this branch of sanitation every good housewife (whatever her station in life) should be acquainted.

Secondly, engineering as applied to local hygiene, embracing all matters relating to house-drainage, internal water-supply and the structural conditions which govern the healthy occupation of the dwelling.

During the past few years much has been spoken and written on technical education, and since the passing of that useful measure, the Technical Instruction Act, in 1889, technical classes and workshops have sprung into existence in almost all parts of this country. Few measures of a broader or a more practical character have found their way into the Statute book, which a glance at the official list of subjects under the conditions of Section 8 of the Act will show. In looking over this list some three years ago, I found that the following, amongst many other branches of science and art, were included, viz. domestic hygiene, plumbing, plasterers' work and sanitary engineering, carpentry and joinery, mechanical and architectural drawing, &c.

It then occurred to me that the intention of the Act could best be advanced by enabling students to obtain useful object-lessons in some at least of the subjects I have named.

With this in view I obtained permission from the Hornsey Local Board to erect a small iron building, on a site belonging to the Board, at Highgate, for the reception of such exhibits as manufacturers and others might be found willing to send, and in this novel movement I had the cordial support and the benefit of the experience of a gentleman who has devoted his energies for nearly fifty years in furthering the education and general well-being of London's working men—I allude to Mr. H. R. Williams, J.P., the chairman of the Hornsey Local Board and of the works committee of the Middlesex County Council. From this modest beginning has resulted what is, I think justly, termed a unique collection of sanitary appliances, working models, &c.

The success which has attended this museum since its opening fourteen months ago has been due to the liberal and enterprising spirit with which the principal manufacturers of this country met the invitation to exhibit, and have given to the public without charge specimens of some of the best and most novel sanitary appliances which modern science and skill could produce, and I take this opportunity of again publicly tendering to them my best thanks for their generous co-operation.

To enable you to judge of the present extent of the Highgate Museum and the advantages which it affords to technical education in North London, I will just mention the following facts. The present buildings have a floor-space of upwards of 5,300 feet super, and comprise a large lecture and drawing-room, plumbers' workshops with bench accommodation for forty-one students and five rooms containing upwards of 1,400 exhibits. These include almost every kind of sanitary appliance, both ancient and modern. Many of the exhibits are fixed and water is laid on, so that the student or other visitor can examine the fittings in actual work. Machines are provided for testing bricks, stone, cement, drain-pipes, water-fittings, &c., and students are instructed in the working of the testing apparatus and are enabled to see and appreciate the practical value of such tests to both the manufacturer and the user. The principles of ventilation and heating and the passage of air-currents through pipes are practically demonstrated. Some of the exhibits are shown in section, so that a knowledge of their form and construction can be easily obtained. In illustration of this I have placed a few water-taps, &c., on the table to show how the interior of the fittings are exposed to view in order that their action may be made clear to the student. These taps when in the museum are placed immediately over similar fittings to which water is laid on. In the case of other fittings, such for instance as water waste-preventing cisterns, those not exhibited in section are supplemented by full-sized sectional diagrams similar to those on the walls.

I think it will be readily admitted that knowledge derived in this way must have far more practical and lasting effect than that gathered from books, however well written or illustrated. The object-lessons taught by such a collection are not only more easily learned by the observant student, but the mind aided by the sense of sight and touch can better retain the information thus acquired. Lecturers and other instructors, including the professional crammer, have repeatedly testified to the advantages which students have derived from visits to the museum. In allusion to cramming, I may observe in passing that this system of helping young men to dodge the examiners, and scrape through their examinations with mere superficial knowledge, is every year becoming more common. I have acted as examiner for several years, and therefore can testify to the extent that cramming is now practised. If it were not divulging secrets, I could tell you some amusing anecdotes as to the slips sometimes made by these "stuffed students" when undergoing examination. Bad as the system is of superficially storing the memory with knowledge likely to serve some particular occasion only, and which in the ordinary course of things is soon forgotten, yet by the aid of object-lessons given in technical museums the crammed one may hope to retain permanently some, at least, of what the coach has thrust upon him.

During the educational term there are three classes held weekly at the Highgate Museum, under the direction and at the cost of the Middlesex County Council, and we have the co-operation of the Worshipful Company of Plumbers in connection with the instruction given in plumbing. These classes are well attended—in fact, so well that students have had to be refused admission in some cases, owing to insufficient accommodation. Practical and theoretical plumbing is taught on Wednesdays and Saturdays by Mr. George Taylor, R.P.C., and lessons are given in geometry and building construction by Mr. Walter Busbridge on Monday evenings. The instruction in both practical and theoretical plumbing is restricted to those actually engaged in the trade of a plumber, either as master, journeyman or apprentice. The classes on geometry and building construction are open to all students. In addition to these classes, evening lectures have been given to the public on domestic hygiene and sanitation by Sir Benjamin Ward Richardson and other well-known sanitarians. The museum is open free to the public on week-days, from 10.30 A.M. to

* A lecture by Mr. De Courcy Meade, delivered at the National Building Trades Exhibition.

8.30 P.M. It is under the care of a practical man, who takes a great interest in his work, and is always ready and willing to explain the use of the appliances to visitors.

The appreciation of the museum by the general public is shown by the fact that it has been visited by upwards of 18,775 persons since it was publicly opened by the Lord Mayor on December 8, 1892. Had the building been situated in a more central position, the number of visitors would no doubt have been very much larger.

Having laid before you a brief outline of what is being done in the north of London for the advancement of technical knowledge in connection with hygiene by the aid of a museum of sanitary appliances, I would ask you to consider the best method of conveying a knowledge of the elementary principles of sanitation to the masses. I feel that until this is accomplished in some measure at least, an improvement in the present low standard of sanitation amongst the working classes cannot be hoped for. We must try to bring home to the mind of the occupier of the cottage the benefits which the knowledge and practice of domestic hygiene confer upon those who obey its laws. I may be told that much has already been done in this direction, with a general reduction of the death-rate, and in proof of such an assertion the statistics issued by the Registrar-General may be quoted; but the highest medical authorities tell us that a large percentage of the present annual mortality is of artificial production and preventable, therefore we should not rest satisfied until the percentage of preventable deaths, with its attendant sickness and suffering, has been reduced to the lowest practicable point. The small diagram on the wall shows in a graphic manner how the annual percentage of mortality recedes from central London outwards; the strong black line shows the death-rate for ten years. From 1883-92 inclusive, the average was 19.8, with a zymotic death-rate of 2.91 for inner London, or "registration London," which is practically the area of the administrative county of London. Outer London had during the same decade a death-rate of 16.1, with a zymotic rate of 2.19. The average death-rate in three suburban districts—viz. Hornsey, Wimbledon and Finchley—amount to 11.5, 12.1 and 12.0 respectively, with zymotic death-rates of 1.16, 1.53 and 1.23. An explanation of the causes that influence the higher death-rate that prevails in the inner ring lie within the province of the medical officer rather than the engineer. I will, therefore, not attempt to offer an opinion thereon. I freely and gladly admit that great strides have been made towards the improvement of both the dwellings and the general surroundings of the British workman; the poor neighbourhoods have certainly undergone a noticeable change for the better during recent years, and as an illustration of the rapid march of sanitary progress, I will read an extract from Dr. Simon's second annual report to the City authorities, in which he describes the sanitary condition of the City in 1850. Referring to overcrowding, Dr. Simon said:—

"Statistics can give you no conception of this crowding. If you turn from the deceptions of an average to the exact analysis of detail, you will find many single rooms in the City with a larger number of inmates than you might otherwise ascribe to entire houses. Instances are innumerable in which a single room is occupied by a whole family—whatever may be its number, and whatever the ages and sexes of the children; where birth and death go on side by side; where the mother in travail, or the child with smallpox, or the corpse waiting interment, has no separation from the rest.

"It is no uncommon thing, in a room of 12 feet square or less, to find three or four families 'styed' together (perhaps with infectious disease among them), filling the same space night and day—men, women and children in the promiscuous intimacy of cattle."

What would the City authorities of to-day say if such a state of things were found within their borders? Yet I am not so sure that a journey a little further eastward would disclose a very marked improvement in 1894 on what Dr. Simon characterised in 1850 as "a pestilential heaping of human beings."

Much, no doubt, still remains to be done, and I would ask you not to look at the question either from an optimist's or a pessimist's point of view, but to consider it from a purely practical standpoint.

If technical museums are to have full effect in educating the general public as well as specialists, they must cover a wider field than the museum at Highgate, which is mainly devoted to sanitary engineering, and I believe this could be accomplished within reasonable limits of space and cost if elementary instruction only was aimed at. The Parkes Museum embraces a much wider area. Sir Douglas Galton, K.C.B., describes the objects that that museum was intended to illustrate in the following terms:—

1. *Engineering and Local Hygiene*, which includes climatology, and causes of disease and death-rates appertaining to physical geography, information on health-resorts, botanical hygiene, geology as bearing on salubrity and water-supply, plans for the healthy arrangement of towns, principles of town drainage, water-supply, scavenging and disposal of refuse, &c.

2. *Architecture*.—(a) Designs and models connected with health in dwellings of every sort, factories, workshops, schools, &c. (b) Materials and details of construction.

3. *Household Requisites*, including fixtures and furniture, and embracing all matters connected with lighting, warming, cooking, cleaning and other domestic sanitary purposes.

4. *Clothing*, embracing materials, shape, climatic influences, &c.

5. *Food*.—Chemistry of food and value for nutrition, as obtained either from the animal or from the vegetable kingdom. Beverages. Dietaries.

6. *Preservation and Relief*.—(a) Personal hygiene. (b) Protection and rescue, including protection against disease, poison, dangerous insects. Lifeboats. Fire-escapes. Lightning conductors, &c. (c) Industrial pathology, or the prevention of accidents, injuries, and diseases incidental to industrial employments. (d) Special hygiene of professional occupations. And Sir Douglas continues:—"You will thus see that the subjects which our Institute would illustrate are spread over the principal proceedings of our daily life. It is not that sanitary knowledge in itself is by any means new, but our progress in what we term our civilisation has developed various new contingencies attending our mode of living, which have altered the conditions which affect the application of sanitary knowledge, so that the want of an institution such as ours has come to be widely felt.

"In looking around at our mode of life in this country, at our habits, our dwellings, is there not on every side an opening for instruction in, or for comment upon, the violation of sanitary knowledge? For instance, look at the hecatombs of infants yearly sacrificed to our mismanagement.

"The Registrar-General tells us that in October, 1888, the deaths of infants in London averaged 164 per 1,000 born.

"In provincial towns the mortality was greater; thus in twenty-seven large towns it averaged 227 per 1,000 born. In Sheffield it was 279 per 1,000 born; Leeds, 294; Leicester, 359.

"Amongst the many causes which lead to this sacrifice of infant life, ignorance of the elements of hygienic treatment is the main cause, and especially in feeding, for many babies are given food that an adult could ill digest.

"When we look around at the large masses of people congregated together in London and in our large towns, we feel in despair as to what methods to pursue to induce them to regulate their lives according to the principles of health and morality.

"It would have been comparatively easy to have done so before the communities had attained their present gigantic proportions, had some far-seeing legislator recognised the importance of regulating the lives of those who dwelt together in communities; but whatever are our present difficulties, we may feel sure that they are less than those which will fall to the lot of our successors if we neglect now to grapple with them."

When dealing with any measure of reform of this kind it is, of course, necessary to carefully weigh the existing conditions, and ascertain in what direction improvement may be judiciously and permanently effected.

I have for many years (upwards of twenty) been engaged in sanitary works of various kinds; during this period it has been my duty to visit some of the most insanitary localities that existed in the Metropolis. I have therefore had special opportunities of seeing the degrading influence of dirt and squalor on the unfortunate inhabitants of these places, and also of observing the chief causes for this deplorable state of things. I have long since come to the conclusion (and subsequent experience has strengthened my views) that the present remedy does not lie in sanitary laws alone or in official vigilance. It can only be effected by the gradual education of the people, particularly the women, in the elementary rules which govern the health of all communities.

The School Boards are doing much useful work in furtherance of the object we have in view; but, as if nature had decreed that this general system of education, which is due to the advance of civilisation, should have some counteracting influence, we find that the congregating of large numbers of children together in schools is in itself an element of danger to the public health. Dr. Thorne Thorne, C.B., the chief medical officer of the Local Government Board, gives several instances in which the outbreak of disease was clearly attributable to school attendance, and, as the matter is one of wide interest and should be known and understood by all who take an interest in educational matters, I will mention the following instance quoted by Dr. Thorne Thorne with reference to outbreaks of diphtheria in schools, and the inferences he draws from the official investigations. He says:—

School influence would appear then to be operative for mischief in a number of ways.

1. It brings together those members of the community who are, by reason of age, most susceptible to diphtheria.

2. The children thus brought together are placed, and remain for many hours of the day, in exceptionally close relation with each other.

3. The closer the aggregation, and the greater the lack of ventilation, with corresponding hindrance to the free movement of air, the greater the risk.

4. Such faulty sanitary circumstances of the school-house and its surroundings, and such other conditions as tend to a condition of general ill-health, in that they induce sore throat, favour the reception by children so suffering of any imported diphtheria infection.

5. There are ample grounds for believing that the aggregation of children in elementary schools "constitutes one of the conditions under which a form of disease of particular potency for spread and for death may be, so to speak, "manufactured."

6. The practices of kissing and of transferring sweetmeats from mouth to mouth—practices which are more common amongst girls than with boys—as also the joint use of drinking-cups, &c., must, according to experience, be credited with assisting in the diffusion of diphtheria amongst school-fellows.

All this goes to show that when training youth, especially by a compulsory process, the greatest vigilance should be observed to prevent the manufacture—to use Dr. Thorne Thorne's words—"of a most fatal disease." The school building should be maintained in the best possible state of sanitation, both structurally and otherwise, and no overcrowding of any classroom, even temporarily, should be permitted. It may be thought that all this is somewhat foreign to the subject of my paper, but as I am advocating the advantages of technical museums in connection with Board and other public schools, it would be rather incongruous to recommend that children be taught sanitation in the schools, whilst the school system itself was productive of one of the very evils that a knowledge of sanitation is calculated to abate.

Can anyone suggest a better way to advance sanitation than by establishing technical museums in connection with our schools, by making elementary hygiene one of the principal subjects of the Education Code? If children (more especially the female portion of them) receive a careful training in domestic sanitation, it will only be a matter of time (not many years) until the whole standard of sanitation throughout the country is raised, with a proportionate improvement in the health, the earning powers, the comfort, and the morality of the people.

The lecture was followed by a discussion, in which the following gentlemen took part:—Messrs. Gilbert Wood, T. Freeman, H. H. Collins, Blair, Brown, and the chairman, Mr. Banister Fletcher. The usual votes of thanks were passed.

BABYLONIAN AND ASSYRIAN EXPLORATION.

ON Monday, at the Victoria Institute, Mr. Hormuzd Rassam gave a summary of the progress of Babylonian and Assyrian exploration. He remarked that fifty years ago Nineveh and Babylon were little more than names, and he went on to describe the discoveries which had been made in the last half century and the share he himself had had in them. He began work in the East in 1844, under Sir Henry Layard, and spent about ten years in exploring the sites of Nineveh, Babylon, Calah and Mosul. A long time afterwards he explored the "Tower of Babel" and the palace of the kings at Babylon, and discovered the site of Khorsabad, the city of Sargon. He lamented the changed attitude of the Turks towards explorers. From being lax they had become very strict, so much so that permissions granted by the Sultan to dig were often hedged round with so many restrictions as to be almost useless. The important thing was to be on good terms with the natives, and a little ingenuity surmounted many obstacles. Thus it was forbidden to dig among tombs, but it was a perfectly legal operation to dig a grave. In conclusion Mr. Rassam deplored the destruction wrought among antiquities by the Arabs, and urged the necessity for increased systematic exploration of the thousands of mounds as yet uninvestigated.

OFFICIAL RULES FOR SCHOOL BUILDINGS.

THE regulations of the Education Department for 1894 contain several alterations in the rules for planning and fitting-up public elementary schools, as will be seen from the following:—

School planning is the science of thoroughly adapting every part of a building, even the minutest detail, to the work of school teaching. Convenience of plan, suitable lighting, proper subdivision into classes and thorough ventilation, with warmth, but without draughts, are its leading essentials. Attention to small points is of extreme importance. Sanitary laws are here as vital as in a hospital. The school architect is recommended first to perfect his plan. His own skill should then enable him to clothe it with form, proportion, character and colour. These building rules are intended to assist school boards and their architects to produce the most compact, convenient and economical plans of school buildings. The cost of maintenance should be kept in view as much as the

capital expense. It is desirable that, before instructing an architect, the teaching staff of a school should be well considered, so that the number of rooms and the accommodation of each may be approximately settled before the expense of building is incurred.

1. Planning and Accommodation.

1. In planning a school the first thing is to seat the children in the best manner for being taught. The accommodation of each room depends not merely on its area, but also on its shape (especially in relation to the kind of desk proposed), the positions of the doors and fireplaces, and its proper lighting. The second point is to group the rooms together in a compact and convenient manner.

2 and 3. Schoolrooms.

2. Every school must have a schoolroom as hereunder, or a central hall as under Rule 8. The proper width for a schoolroom is 18 to 20 feet for long desks, or 22 feet for dual desks. If the width does not exceed 20 feet, groups of long desks, three or four in number, according to the width, must be used; if the width is 22 feet, dual desks, five rows deeps, are most suitable. (For classrooms, see Rule 7.)

a. Accommodation in schoolrooms for elder children is calculated by the number of children seated at desks and benches, subject to a minimum of 10 square feet per child being provided. (For the mode of calculating accommodation in classrooms see Rule 7, in infant schools see Rule 16 f.)

b. Double bank schools (now almost obsolete) require rooms 32 feet wide, walls left clear for three rows of desks, and ample lighting from windows on both sides extending to ceiling.

c. Wasted space cannot be considered.

3. The doors and fireplaces in schoolrooms must be so placed as to allow of the whole of one side of the schoolroom being left free for the groups of benches and desks.

a. No schoolroom lighted from one side only can be approved. The gable ends should be fully utilised for light. (See also Rules 9 and 9 b.)

4. Walls, Floors and Roofs.

4. The walls of every schoolroom and classroom, if ceiled at the level of the wall-plate, must be at least 12 feet high from the level of the floor to the ceiling; and, if the area contain more than 360 superficial square feet, 13 feet, and, if more than 600, then 14 feet.

a. The walls of every schoolroom and classroom, if ceiled to the rafters and collar-beam, must be at least 11 feet high from the floor to the wall-plate, and at least 14 feet to the ceiling across the collar-beam.

b. Great care should be taken to render the roofs impervious to cold and heat.

c. Roofs open to the apex are not approved. They can only be permitted where the roofs are specially impervious to heat and cold, and where apex ventilation is provided. Iron tie-rods are least unsightly when placed horizontally.

d. The whole of the external walls of the school and residence must be solid. If of brick, the thickness must be at least one brick and a half, and if of stone, at least 20 inches.

e. All walls, not excepting fence walls, must have a damp-proof course just above the ground line.

f. The whole area of the building should have concrete 6 inches thick under the ground floor, and air bricks for ventilation to joints.

g. Timber should be protected from mortar and cement by asphalt or tar.

5. Entrances.

5. Entrances should be separate for each department. In large schools more than one entrance to each department is desirable. The principal entrances should never be through the cloak-room. Entrance doors should open outwards. A porch should be external to the schoolroom.

6. Cloak-rooms.

6. Cloak-rooms must be external to schoolrooms and classrooms with gangways at least 4 feet wide, amply lighted from the end. Hat-pegs should be 12 inches apart, numbered, and of two tiers. The hanging space necessary to provide a separate peg for each is thus 6 inches lineal per child.

7. Classrooms.

7. Classrooms are calculated at 10 square feet if not providing accommodation for more than sixty children. Six rows of dual desks or four rows of long-length desks are permissible in such classrooms. When the front of a class is narrowed, but the area of the room is not reduced, a seventh row of dual desks or a fifth row of long desks may be allowed. Rule 2 applies to all rooms providing accommodation for more than sixty, or being more than 24 feet 8 inches deep from the window wall.

a. The minimum size of classroom is 18 feet by 15 feet. If desks are placed longitudinally the width should not be less than 16 feet. This latter width is also allowed in schoolrooms of very small size.

b. The classrooms should never be passage-rooms from one part of a building to another, nor from the schoolrooms to the playground or yard, and should be on the same level as the schoolroom. Each should be easily cleared without disturbance to any other room.

c. The number of classrooms should, where practicable, equal the number of classes in the schoolroom.

d. The excessive use of movable partitions should be avoided.

8. Halls.

8. Large schools are sometimes planned with a central hall, from which the classrooms are entered, and which is not, as a rule, calculated in the accommodation.

But in the case of mixed schools an exception is made, one class being necessary in the hall in order to secure a teacher's supervision of the separate exits to the latrines (see Rule 13 *a*). The hall must, therefore, be suitable for teaching such class; it must be fully lighted, warmed and ventilated, and must contain a floor space of not less than 1,200 square feet, and the position of the class should be marked on the plan.

9. Windows.

9. Every part and corner of a school should be fully lighted. The light should, as far as possible, and especially in classrooms, be admitted from the left side of the scholars. (This rule will be found greatly to influence the planning.) All other windows in classrooms should be regarded as supplementary, or for summer ventilation. In cases where left light is impossible, right light is next best. Windows full in the eyes of teachers or scholars are not approved. In rooms 14 feet high any space beyond 24 feet from the window wall is insufficiently lighted.

a. Windows should never be provided for the sake merely of external effect. All kinds of glazing which diminish the light, and are troublesome to keep clean and in repair, should be avoided. A large portion of each window should be made to open for ventilation and for cleaning.

b. The sills of the main lighting windows should be placed about 4 feet above the floor, and the tops of some should always reach nearly to the ceiling. The ordinary rules respecting hospitals should here be remembered. Large spaces between the window-heads and the ceiling are productive of foul rooms.

c. Skylights are objectionable, and should never be resorted to where windows are possible. Plans needlessly involving their use cannot be approved, except in the case of central halls having ridge or apex ventilation.

10. Staircases.

10. A staircase like a porch must be external to the schoolroom. No triangular steps or "winders" should be used. Each step should be about 13 inches broad and not more than 6 inches high. The flights should be short and the landings unbroken by steps. The number of staircases should be sufficient not only for daily use, but for rapid exit in case of fire or panic.

11. Ventilation.

11. Apart from open windows and doors, there should be provision for copious inlet of fresh air; also for outlet of foul air at the highest point of the room; the best way of providing the latter is to build to each room a separate air chimney carried up in the same stack with smoke flues. An outlet should have motive power by heat or exhaust, or it will frequently act as a cold inlet. The principal point in all ventilation is to prevent stagnant air. Particular expedients are only subsidiary to this main direction. About $1\frac{1}{2}$ superficial inches per child for outlets and rather more for inlets is desirable.

a. Although lighting from the left hand is considered so important, ventilation in summer demands also the provision of a small swing window as far from the lighting as possible, and near the ceiling.

12. Warming.

12. The warming should be moderate and evenly distributed so as to maintain a temperature of from 56 degs. to 60 degs. When a corridor or lobby is warmed the rooms are more easily dealt with, and are less liable to cold draughts. Where schools are wholly warmed by hot water the principle of direct radiation is recommended. In such cases open grates in addition are useful for extra warming occasionally, and their flues for ventilation always.

a. A common stove, with a pipe through the wall or roof, can under no circumstances be allowed. Stoves are only approved when (i.) provided with proper chimneys, as in the case of open fires; (ii.) of such a pattern that they cannot become red hot, or otherwise contaminate the air; (iii.) supplied with fresh air, direct from the outside, by a flue of not less than 72 inches superficial; and (iv.) not of such a size or shape as to interfere with the floor space necessary for teaching purposes.

b. A thermometer should always be kept hung up in a school.

13. Sanitary Arrangements.

13. Water-closets within the main school building are not desirable, and are only sanctioned for women teachers. All others should be at a short distance, and completely disconnected from the school.

a. The doors, staircases and passages leading from the schoolroom to the latrines (whether in mixed or in other schools), and the latrines themselves, must be separate for the two sexes, and constructed entirely apart from each other. In the case of a mixed school this rule especially affects the planning. Where passages or corridors are unavoidably used by both sexes, there must be complete supervision from the classrooms by sheets of clear glass.

b. Each closet must be separate, fully lighted and ventilated, and properly screened or supplied with a door. More than one seat is not allowed in any closet.

c. The children must not be obliged to pass in front of the teacher's residence in order to reach their latrines.

d. The following table shows approximately the number of closets needed:—

		For Girls.	For Boys.	For Infants.
Under 30 children	.	2	1	2
" 50 "	"	3	2	3
" 70 "	"	4	2	3
" 100 "	"	5	3	4
" 150 "	"	6	3	5
" 200 "	"	7	4	6
" 300 "	"	8	5	7
		Urinals in proportion.		

e. Cesspools and privies should only be used where unavoidable, and should be at a distance of at least 20 feet from the school. Earth or ash closets of an approved type may be employed in rural districts, but drains for the disposal of slop and surface water are still necessary. The proximity of drinking-wells should be carefully avoided.

f. Soil-drains must always be laid outside the building (on a hard even bottom of concrete) in straight lines, with glazed stoneware pipes, carefully jointed in cement, and made absolutely water-tight. A diameter of 4 inches is sufficient unless for drains receiving the discharge of more than 10 closets. Above this number the diameter should be 6 inches. The fall should never be less than 1 in 30 for 4-inch, and 1 in 40 for 6-inch drains. An inspection opening or chamber should be provided at each change of direction, so as to facilitate cleansing the drain without opening the ground. Every soil-drain must be disconnected from the main sewer by a properly constructed trap placed on the line of drain between the latrines and the public sewer. This trap must be thoroughly ventilated by at least two untrapped openings, one being the 4-inch soil pipe carried up full size above the roof, and the other an inlet pipe connected with the side of the trap furthest from the public sewer. Automatic flushing tanks are desirable where trough closets are used.

g. Urinals must in all cases have a sufficient supply of water for flushing.

h. Waste pipes from sinks or lavatories should be first trapped inside and then made to discharge direct through the wall over a trapped gulley.

14. Desks.

14. Benches and desks, graduated according to the ages of the children, should be provided for all the scholars, and placed at right angles to the light. (See also Rules 3 *a* and 9.)

An allowance of 18 inches per scholar at each desk and bench will suffice (except in the case of the dual desk), and the length of each group should therefore be some multiple of 18 inches, with gangways of 18 inches between the groups and at the walls. In the case of the dual desk the usual length is 3 feet 4 inches, and the gangways 1 foot 4 inches.

a. The desk should be very slightly inclined. An angle of 15 degs. is sufficient. The objections to the inclined desk are that pencils, pens, &c., are constantly slipping from it, and that it cannot be conveniently used as a table. The objection to the flat desk is that it has a tendency to make the children stoop. A raised ledge in front of a desk interferes with the arm in writing.

b. As a general rule, no benches and desks should be more than 12 feet long. And no group of long desks, in a schoolroom providing for more than 60 children, should contain more than four rows of benches and desks (or three, if the width is less than 20 feet), because in proportion as the depth is increased the teacher must raise his voice to a higher pitch; and this becomes exhausting to himself, while at the same time it adds inconveniently to the general noise. With the use of the dual desk the space between seat and desk disappears, as the children stand in the gangways.

15. *Sites and Playgrounds.*

15. Every school should have an open airy playground proportioned to the size and needs of the school. The minimum size of site is, in the absence of exceptional circumstances, a quarter of an acre for every 250 children. If the school is of more than one storey this area may be proportionally reduced. The minimum open space is 30 square feet per child.

a. In the case of a mixed school, playgrounds must be separate for the boys and girls.

b. All playgrounds should be properly levelled, drained, enclosed and fitted with some simple appliances. A portion should be covered, having one side against a wall. A covered way should never connect the offices with the main building. Buttresses and corners should be avoided.

c. An infant school should have its playground on the same level as the school.

16. *Infant Schools.*

16. Infants should not, except in very small schools, be taught in the same room with older children, as the noise and the training of the infants disturb and injuriously affect the discipline and instruction of the other children.

a. There must be no opening wider than an ordinary doorway between an infants' and any other schoolroom, because of the sound of the infant teaching.

b. An infant school and playground should always be on the ground floor, and if more than 80 scholars are admitted, should have one gallery and a small group of benches and desks for the occasional use of the elder infants.

c. No infant gallery should hold more than 80 or 90 infants. It should be well lighted from one side. The light for object lessons is as good from the right as from the left.

d. The width of an infant schoolroom should be in proportion to its size, but not more than 24 feet. A covered marching-ground is desirable.

e. The babies' room should always have an open fire, or be maintained at a temperature of about 65 degrees.

f. The accommodation of an infant school is calculated at 8 square feet for each child, after deducting wasted or useless space, but a larger area should be allowed wherever practicable. Care should be taken that the numbers are conveniently seated and that space is left for marching. Where a second standard is taught in an infant school the accommodation for it is calculated at 10 square feet per child.

17. *Cookery Centres and Classrooms.*

17. A cookery centre should be capable of accommodating at least one class of twenty-four at practice and not more than seventy-two at demonstration at one time. A cookery classroom should contain at least 400 superficial feet, and be approached by a separate entrance in the girls' playground. A small scullery is necessary, and a bonnet-room.

18. *Workshops and Laundries.*

18. Workshops and laundries are best entirely apart from the school.

19. *Teacher's House, &c.*

19. The residence for the master or mistress should contain a parlour, a kitchen, a scullery and three bedrooms, and the smallest dimensions which their lordships can approve are—

a. The residence must be so planned that the staircase is immediately accessible from an entrance-lobby and from the parlour, kitchen and each bedroom, without making a passage of any room.

For the parlour	12 ft. by 12 ft.	} of super- ficial area ;	{ 8 ft. } in height to wall-plate. 8 ft. } if sealed at wall-plate, or 7 ft. to wall-plate and 9 ft. to ceiling.
" kitchen	12 ft. by 10 ft.		
" one of the bedrooms	12 ft. by 10 ft.		
" two other bedrooms	9 ft. by 8 ft.		

b. Each bedroom must be on the upper storey, and must have a fireplace.

c. The parlour must not open directly into the kitchen or scullery.

d. There must be no internal communication between the residence and the school.

(e) Windows should be carried up as nearly to the ceilings as practicable.

(f) There must be a separate and distinct yard, with offices.

(g) A caretaker's house need not be quite so large.

(h) All houses should be separate from, and not built as part of, the schoolhouse.

20 and 21. *Loans.*

20. No loan of money can be obtained from the Public Works Loan Commissioners unless the whole cost of the school, exclusive of site, legal expenses, extra rooms for instruction authorised by the Code and residences (if any) is kept within the sum of 10*l.* per child accommodated. An allowance will also be made in reference to the cost of a central hall not calculated in the accommodation (Rule 8). Rooms for extra subjects recognised by the new Code, such as drawing, chemistry, &c., will have an allowance varying from 15*s.* to 20*s.* per square foot.

From 275*l.* to 400*l.* will be allowed for a caretaker's house. From 275*l.* to 500*l.* will be allowed for a cookery centre. Whether the necessary loan be borrowed in the open market or not, extravagant plans cannot be approved.

21. The Department do not entertain applications for loans when the expenditure has been incurred without their previous sanction.

THE BIRMINGHAM SCHOOL OF ART.

IT is well known that the Birmingham Corporation, while accepting the South Kensington administration as a sort of burthen which has to be sustained, take care that the elasticity of their school cannot be overcome. The museum and art gallery committee have no objection to admit that, when tested by the machinery for examination which is employed by the Department, the Birmingham school stands conspicuously at the head of the schools of art in the United Kingdom, for that result has been attained by a training which is not inspired from South Kensington. What the Corporation and the people of Birmingham accept as a test of the progress of the school is the report which is prepared by one of the local artists, who can realise how far the school can aid in the advancement of local industries. This year Mr. W. J. Wainwright was appointed examiner, and he has sent in the following report on the works he saw in February last :—

"It will be seen from the detailed report on each competition that the year's work has been productive of satisfactory results. It has been a good steady year ; very little falling off, and what falling off there is, is more than sufficiently compensated for by the progress made to insure a balance on the right side. The greatest advance of the year has been made in elementary design at the Central, and in design in all sections at the branch schools, both drawn and modelled. At the Central School this advance, it would appear, is immediately due to the influence of the lectures by Messrs. Jackson and Morgan. The work resulting from those lectures is far better and more extensive than any that had previously been done in that way. At several of the branch schools an exhilarating briskness and enterprising spirit of emulation characterise all the work. The applied design is taking an increasingly important position in the school, as will be evident when the works are publicly exhibited. There is one undesirable class of work in the design sections the existence of which is due to circumstances external to the school—*i.e.* the laborious, careful outline designs, done for the purpose of obtaining certificates, and the chief aim of which appears to be a characterless perfection. This work is evidently a penance to those who do it. It can never commend itself to the designer ; it is ignored by the manufacturer, because it has no practical value ; to the examiner it is an enigma, to the student a delusion. These drawings are in this school a lingering remnant of what was once its dominating spirit. I have commented thus upon the only undesirable work with which I have had to deal, firstly, because it is so well done ; and, secondly, the school having outgrown it long ago, it is fitting that a final statement concerning it should appear in this annual report, were it for no other purpose than to discriminate it as a misapplied study in design towards which responsibility rests not with the school directorate. In industrial art training there is little room for the abstract. All endeavour should from the beginning be directed towards an application. This has now for many years been the aim and purpose of the teaching of this school ; and although the results of that teaching have been subjected to the onslaught of that perennial critic the "practical man," it is only those who know from internal knowledge the difficulties which have stood in the way who are aware how unreasonably exacting that critic has often been. The difficulty to which I now allude is the difficulty of having to teach the student to do a thing without having the means of demonstrating to him practically how it should be done. The old adage which differentiates between theory and practice has no truer or more forcible application than in industrial art training. If students are to be taught industrial design so as to be of the greatest use to themselves and to the community, they must have access to, and practice in, the art workshop. They must acquaint themselves with the nature of the materials of which they propose to treat, and with the processes and the possibilities of the processes by which those materials can be treated. Thus informed, the creative artistic mind is prepared to originate effects which the most prolonged and careful theoretical teaching could never bring about. The office-trained designer is a creation of this century, and it is to be fervently hoped that this century will close over the system which has stamped the industrial art of this country with its worst characteristic, causing whole lives to be spent, not in endeavouring to give expression to artistic idea by a proper treatment of material, but in the torturing of material to the realisation of fascinating impracticabilities in pencil and colour, by which the adroit designer too often captivates the untutored fancy of a confiding public. Nor will this state of things be remedied until the designer is master of the

material for which he designs, and the workman elevated by art training from the level to which he has been reduced. It is not until this position is understood that the student, and for that matter the community at large, can realise the influence upon the art of the country which the setting up of the art laboratory portends. It is premature thus early to look for results from the very important and necessary additions in the art laboratories, but what those results will include is indicated by the effect which the now-established *repoussé* work has had on the character of designs made by students who have already executed designs in metal. One sees at once that it has been the aim of the student to express on paper only what the mind has already foreseen in the metal, discarding all attempt to invest the drawing with any quality having no bearing on the work to be produced. In other words, there is each year a larger proportion of the design work possessing all the requirements of the practical design ready to the hand of the producer. After careful examination of the year's work in the school, and finding so much advance has been made in directions already particularised, I am of opinion that the capacity of the teaching staff has never been so brilliantly evident as at the present time. Nor has the work of the school ever contained the same proportion of efforts informed with fine feeling for the higher styles, and instinct with an inner sense of quality, so difficult to express, so essential for the life of art; and what is perhaps most significant is that these qualities are not confined to experienced students who are pursuing the higher studies, but are evident in the works of students who are little more than beginners, thus showing that, from the earliest steps in design, the progress of the student is assured, so far as it can be assured, by right direction."

Mr. Wainwright's remarks should be carefully considered by every committee associated with an art school in Great Britain. The "exhilarating briskness and enterprising spirit of emulation" of which he speaks are qualities which are unknown in most of the departmental schools. For long years Birmingham, like other towns, was compelled to plod wearily in the track which the clerks at South Kensington prescribed. Mr. Wainwright prays that the system of "torturing of material to the realisation of fascinating impracticabilities in pencil and colour" may come to an end with the century, but as long as able Academicians and other artists are to be found to pose as industrial experts, how is the reform to be attained? If half a dozen manufacturers were allowed every year to examine the works of the schools, we might then believe the beginning of the end for fascinating impracticabilities was drawing nigh.



The Oxford Museum.

SIR,—The reprint of the book on the Oxford Museum brings vividly to mind a most interesting chapter in the history of art and science. Forty years ago the erection was watched with high hopes as a new departure in the art of building, and as the realisation of theories which Mr. Ruskin had urged with such incomparable eloquence. Two letters from him to Sir Henry Acland are eminently characteristic in their summing-up of his whole creed.

The Museum was built in 1859, to give to the study of natural history and medicine the same advantages as the schools of classics, history and theology. The study of science had no encouragement at Oxford, and when the proposal was made to build the Museum the fiercest opposition was aroused, partly owing to the opinion of one Vice-Chancellor, that science tended to infidelity; but it is particularly interesting to read that Dr. Pusey openly advocated scientific study, and that if it had not been for him and his friends the final vote for the Museum would have been lost. Thirty thousand pounds were grudgingly voted, and the question had to be determined what style of architecture would best combine beauty and convenience. This was Mr. Ruskin's opportunity, and, after a sharp contest, he won the day. Architects were invited to send in designs, and in due course the first prize (Gothic) was awarded to Sir Thomas Deane and Mr. Woodward, of Dublin; and the second, 200*l.* (Renaissance), was divided, as of equal merit, between Mr. Barry, of London, and Mr. Travis (Travis & Mangnall), of Manchester. It was a moment of supreme importance to Mr. Ruskin and to the enthusiastic group of artists who felt that it was a turning-point in the history of art. The very difficulties and limitations which beset the undertaking were an additional interest to Mr. Ruskin, who could thus see put to the severest test his conviction that "the essence and power of Gothic lies in its adaptability to all needs."

Another interesting feature in the history of the building is that its details were entrusted to Irish workmen brought over by the architects, who had had experience of them in building the Trinity College Museum in Dublin, and their work was

a source of high satisfaction to Mr. Ruskin—it was the "first building in the country the ornamentation of which was entrusted to the invention of the workmen." Thus the capitals were all original studies of flowers and animals instead of being servile copies of old examples.

The Queen presented five statues, and Mr. Gladstone, Dr. Pusey and the Duke of Argyll were amongst the many contributors.

It is satisfactory to find the author of the vigorous address of 1859 still unswerving from his beliefs, and confident in the work which nearly half a century ago he helped to initiate.—
Your obedient Servant,
HERMES.

GENERAL.

An Iona Cross, designed by Mr. Pearson, R.A., is proposed for erection on the highest crest of the Down at Freshwater, as a memorial of the late Poet Laureate.

Mr. G. D. Oliver, of Carlisle, has gained the first prize in the competition for the new infirmary at Whitehaven.

A Statue of the late Rev. Dr. Hanna was unveiled in Belfast on Saturday. It is the last work of the late G. B. Birch, R.A.

Mr. R. Hammond, consulting engineer to the Coventry Corporation in respect to electric lighting, has been awarded by the Morley Corporation, in an open competition, the premium of 100 guineas for the best electric-lighting plan for the borough.

Messrs. W. & G. Shearburn have been successful in the competition for the Oddfellows' Hall, Dorking.

A Grammar School is to be erected in Paisley in accordance with the terms expressed by the W. B. Barbour trustees, who have presented to the School Board the sum of 15,000*l.* for that purpose. Mr. D. Barclay will be the architect.

At All Saints, Plymouth, four large single lights in the apse are now fitted with painted glass. They represent patron saints of some of the guilds of the parish. The figures are very large, standing upon simple bases and under canopies, with quarry work at top and bottom. They are the gift of the vicar, the Rev. C. R. Chase, and have been carried out under the direction of Mr. Edmund Sedding, architect, of Plymouth.

A Reredos was unveiled on Easter Day at Holy Trinity Church, Micklegate, York. It is of pine, carved in the Perpendicular style. The carving was executed by Milburn, of York, from designs of Mr. Hodgson Fowler, of Durham.

A Stained-glass Window over 30 feet in height will be among the contributions to this year's Salon. It is the work of M. Champigneulle and was designed by M. Albert Maignan. The subject is one of the combats of Joan of Arc.

The Statue of an Angel about 22 feet in height has been placed on the upper platform of the Tower of St. Jacques, Paris, which is about 176 feet from the street level.

The Prince Regent of Bavaria has conferred the order of St. Michael on the following French painters:—MM. Jean Paul Laurens, Cormon, St. Marceaux Doucet and Maignan.

An Exhibition of statuary models, paintings and sketches by Carpeaux, the sculptor of the *Dance* group before the Opera House, will shortly be held in the Ecole des Beaux-Arts, Paris.

Mr. Lewis E. Isaacs will read a paper on "The Construction of Roads and Streets from a Sanitary Point of View" at the meeting of the Sanitary Institute on Wednesday, the 11th inst.

M. George Bechmann, chief engineer of bridges and roads, and chief of the sanitary works of Paris, will read a paper on "Sanitation in Paris" at the meeting of the Sanitary Inspectors' Association at Carpenters' Hall to-morrow (Saturday).

Mr. R. Lane, Q.C., the magistrate at the North London Police-court, has decided that a photographer's show-case is not a building as defined in any of the Metropolitan Building Acts, and has awarded costs against the London County Council, by whom the owner was summoned for setting it up without obtaining consent.

Mr. H. T. Hinks has purchased the property known as "The Friary," Lichfield, which was formerly a monastery, and abounds in historic associations. It was founded early in the thirteenth century by Bishop Stavenby, Bishop of Coventry and Lichfield, but seventy years later it was destroyed in the great fire which demolished almost the whole of the city. The present house was built in 1545.

An Exhibition of oil-paintings and monochromes (sea and land scenes, fruit and flowers), by Mr. Hamilton Marr and Mrs. Sophie Marr, will be soon held at the Gallery, 9 Conduit Street, Regent Street.

The Technical Commission on the Nile propose to raise the temples at Philæ to a higher level in order that they may be preserved without preventing the construction of the dam at Assouan.

The Architect.

THE WEEK.

At the meeting of the Institute of Architects on Monday evening, Mr. THOMAS BLASHILL read a paper on the London County Council Chamber, Spring Gardens, and described the work of enlargement and reconstruction, which had been carried out under his supervision. Erected in 1861 from the designs of the late Mr. MARRABLE, the building was rectangular, 55 feet by 30 feet and 30 feet high. For purposes of enlarging the only space available was on the north side, and this space he utilised for the construction of an addition with apsidal or semicircular termination, but it had involved changing the axes of the building. In the reconstruction Mr. BLASHILL had adhered to the lines of decoration and internal treatment adopted by Mr. MARRABLE in his designs. Mr. BLASHILL described in detail the work of reconstruction, the chief point of interest being perhaps that the acoustic properties of the chamber were better than ever—the height of the enlarged chamber not having been altered, but kept at 30 feet as before. The room underneath the apsidal addition to the chamber was utilised for the architect's department, accommodating from twenty to thirty clerks. Of course it was only natural for Mr. BLASHILL to say that if he had to design a council chamber with a free hand he would have considerably altered the plan. In the discussion that ensued, Mr. BRYDON, who seconded a vote of thanks to Mr. BLASHILL, proposed by Mr. ASTON WEBB, spoke of council chambers for provincial Councils, and laid great stress on perfect noiselessness, which Mr. BLASHILL had explained was the case at Spring Gardens. Mr. WILLIAM WHITE, Mr. C. FOWLER, Mr. WILLIAM WOODWARD, Mr. JOHN HUTTON, and Professor KERR also joined in the discussion.

In the Glasgow Sheriff Court judgment has been given in a case where the plaintiff claimed 500*l.* as compensation for the illness and deaths of members of his family, caused by the defective condition of a house in Langside belonging to the defendants. The annual rent was 45*l.* On taking the house the plaintiff was assured that the drains were in good order, for they had sustained the smoke test. Afterwards, when illness attacked his family, the plaintiff applied to the local sanitary inspector, and it was found that the drains were in an unsatisfactory state. It was proved that successive attacks of diphtheria were to be ascribed either directly to the drains, or indirectly by lowering the victims' system until they became susceptible to attacks. The defendants maintained that the plaintiff should have left the house, when he discovered its dangerous condition. The Sheriff said there was no absolute rule on this subject, and a man was not bound to leave a house simply because he thought there was something wrong with the drains. It was a serious thing to leave a house and find yourself in collision with your landlord. If a man were satisfied that the drains were wrong and the landlord said he would do nothing, then he ought not to expose himself to a peril which the landlord said he would not remove. But where a landlord had already removed defects complained of, and, through his plumber, had undertaken to remove further defects complained of, it would be an unwise proceeding to leave the house and give the landlord no opportunity of removing the defects. As it was proved that the plaintiff's outlay amounted to 170*l.*, the Sheriff considered that 200*l.* was a fair amount to award. But if money could be any compensation for his losses plaintiff should have had the amount he claimed, which was not excessive.

It was at one time doubted by archaeologists whether in Egypt a Stone Age existed as in more northern regions. The paper which was read before the Society of Antiquaries of Scotland would of itself be enough to support the affirmative. Mr. FINLAY found examples of worked flints in the desert at Gebel-el-Gheir and other localities near Luxor. They are mostly flakes and chips, but among them are a very well-formed borer, a round edged scraper, several leaf-

shaped and triangular flakes that have been apparently used as side-scrapers, and one or two discoidal flints, the use of which is not obvious. A saw-toothed flake and a portion of a very finely-made instrument with extremely minute serration were obtained in the same locality, but not with the other flints. Much difference of opinion existed for some time after the first discoveries of worked flints in the Nile Valley, but there is now no doubt that along with the produce of the flint-working of comparatively recent times for the armature of the threshing sledges and gun-flints, as well as for purposes connected with ancient arts and ceremonial observances, there have been found in various localities along the Nile Valley a series of prehistoric flint implements corresponding more or less with those of Europe.

It is usually stated that GEORGE JAMESONE, who is known as the "Scottish VANDYKE" since WALPOLE's time, was born in 1586 in Aberdeen, that his father was an architect, and that he was a fellow-pupil with VANDYKE in RUBENS's studio in Antwerp. From the researches of Mr. J. R. LYELL among the Guildry Registers of Edinburgh, it would appear that the artist was apprenticed to an Edinburgh painter. The following entry has been discovered:—"1612, May 27.—GEORGE JAMESONE, son to ANDRO JAMESONE, burges in Aberdeen, enteris prenteis to JOHN ANDERSONE, paynter, for acht yeiris, conforme to their indentouris schawen, and payit of entre silver xiijs. iiij*d.*" In the margin of the register is "JAMESONE, paynter." In 1612 GEORGE JAMESONE's age would be twenty-six years, and after an eight years' apprenticeship he would have attained the age of thirty-four years, a rather late time to commence business. Then he must have spent some years as a pupil or assistant with RUBENS. If JOHN ANDERSONE, of Edinburgh, was a "paynter", of portraits, how is it that his name and works have been ignored? Some day an intelligible and consistent account of GEORGE JAMESONE may be prepared, but up to the present, inquiries seem to increase the obscurity around him.

So many people have an interest in the outlay on roads and streets that adjoin their houses, it is not right to allow the case Corporation of London *v.* GOODING to proceed without some notice. At the same time, as it is still *sub judice*, only the facts can be mentioned. Defendant is tenant under the Corporation of a laundry in the Cattle Market, Islington, and covenanted to pay for certain repairs to the road adjoining his premises. If any difference arose, it was to be settled by the certificate of the City architect. As the amount claimed appeared excessive, Mr. GOODING declined to pay. An action was taken in the City of London Court on February 22, but the deputy judge stopped the case and refused to allow it to go to the jury, on the ground that the certificates of the City architect were binding and could not be got behind. Defendant's counsel stated that he had abundant evidence to show that what was done to the street was not a repair but an alteration, caused by the Corporation improving neighbouring streets, their property. On Tuesday last, application on behalf of Mr. GOODING for a new trial was made in the Queen's Bench Division before Mr. Justice CHARLES and Mr. Justice HENN COLLINS. The application was granted, Mr. Justice CHARLES stating that there was a substantial case to go to the jury as to whether what was done was a repair or an alteration. Mr. Justice HENN COLLINS stated that the City architect's certificate would be swept aside should the jury decide that it was not a repair. The Corporation was ordered to pay the costs of the appeal.

THAT temporary hospitals can be costly is evident from the experience of Lower Tooting, where, without counting the site, the "Fountain" will entail an expenditure of 117,000*l.* on the ratepayers. It appears the cost per bed is about double what was paid for the temporary hospital at Tottenham. It is no wonder the Managers are taken aback. But henceforth there is to be no diminution of space, for they have resolved that in any ward or pavilion to be hereafter erected for convalescing fever patients, not less than 104 feet floor space, and 8 feet lineal space in the dormitories, and 60 square feet floor space in the day-room and dining-room combined be allowed for each patient.


BRONZE DOORS.

THE door is the weakest part of a building. Unless it has an area that will allow an individual of ample dimensions to pass through it is useless, and wherever friends can enter enemies are likely to follow. Windows are also openings, but they could be made secure by a variety of arrangements in days before patented appliances were introduced. Love, it has been said, laughs at locksmiths, and internal as well as external foes are often ready to demonstrate that a door is not an obstacle to ingress and egress. The history of the door becomes, therefore, a sort of comment on the strength of public and domestic government as well as of construction. Egyptian kings were aware they would not be allowed to rest in peace within pyramids, however colossal, unless the entrance to the tomb was concealed and placed at a height which could not be easily scaled, sometimes nearly sixty feet, with passages from the opening that were bewildering. Dr. DÖRPFELD'S plan of the palace at Tiryns suggests how roundabout was the course which had to be traversed before a visitor could have a chance of testing the strength of the entrance to the forecourt of a Greek country house. The effective doorway in many Mediæval churches would appear to be intended to admit little children instead of men and women; it is so small that a symbolical signification has been devised to explain its unfitness: the church door, it is said, was a compulsory reminder of the necessity of humbling oneself before entering the building. To gain admission to one of the Irish round towers it was necessary to have some means to reach a height of ten or more feet. Every visitor to old castles in Scotland is puzzled by the inhospitable character of the entrances. They are often so narrow in the North that jovial FALSTAFFS must have been excluded. The Scottish gentleman required at least two doors, "the outer of grated iron, the innermost of oak clenched with nails;" and sometimes, as SCOTT adds, "there was no stair at all, and the inhabitants ascended by a ladder from one storey to another." At one time the door in most parts of Europe was an example of military rather than civil construction. The old Eastern traveller who was amazed when he found there was a palace in Bokhara which had doors that were fixed back to the walls and were never closed for more than a century before his visit, could well declare he had seen nothing to compare with it in any other part of the world. In spite of the advance of civilisation, that sort of confidence has not yet become general. We may doubt whether it was ever witnessed in Asia. And yet if the etymologists are right the word originally signified an opening.

As a consequence of their insecurity doors were not only made strong enough to resist enemies, but it was found necessary to impart an expression of strength to them that all could understand. Wood was the material that men were compelled to employ, but it was made more resisting as well as more impressive by the application of metal. The strips from Balawat, in the British Museum, on which the victories of SHALMANESER II. are embossed, are substantial evidence to support the ancient traditions of the practice. They could not have added much to the resisting power of the gate they adorned, but they produced an effect that was as advantageous. The Mediæval architects were aware of the influence of the associations connected with metal, and the ramifications of hinges which are so often displayed on church doors subserve another purpose besides one of decoration.

It has been assumed that the ancient smiths were capable to do more than attach slips and plates to wood—that they could produce metal doors surpassing those which are being introduced into modern banks and repositories. Taken literally, such a description as is given of the Palace of Alcinoüs in the "Odyssey," with its brazen walls, golden doors, silver lintels, would be a proof of skill and wealth which are not common in our time. The account which HERODOTUS gives, as if he were an eye-witness, of the hundred gates of brass or bronze, with their entablatures and supports of the same metal, is also surprising. But what is probable is that the poet and the historian-traveller were like all the uninitiated in construction among their contemporaries, and confounded an outer coating with solid stuff. They were not the only victims to skill in veneering.

To investigate whether the ancients were competent to fashion immense pieces of metal-work is, however, outside our purpose. There is no doubt that they could make large figures and structures out of thick as well as thin pieces of bronze, cast or malleable plates, which they united by means of rivetting or by soldering, a process in which they were proficient. Recent explorations confirm WINCKELMANN'S conclusions when he said:—

We are informed by Pausanias that in the earliest ages, before the flourishing days of art, figures in bronze were composed of separate pieces fitted to each other and fastened by nails; as was a *Jupiter* at Sparta, the work of Learchus, of the school of Diponius and Scyllis. As this mode of casting statues was easier than the other it continued to be practised even in later periods, of which six Herculaneum female figures of and under the size of life are a proof, for the heads, arms and legs were cast separately, and even the trunk is not a single piece. These pieces are not united by solder—no traces of it having been discovered when they were cleaned—but are joined by tenons dovetailed in, which, from their shape , are called in Italy swallows' tails, a *coda di rondine*. The short mantle of these figures, which likewise consists of two pieces, a front and back, is joined on the shoulders, where it is represented as being buttoned. In this way the ancient artists strove to guard against defects not easily avoided in casting whole statues by a single operation.

Any one who has had an opportunity to observe the production of the immense statue of *Liberty*, which now is a landmark near New York, will be able to realise what can be done by piecemeal construction. With architectural work there would be less difficulty, and a very effective gate or door could be made up by a series of plain panels with borders on which a simple pattern was punched or engraved. When we read that STILICHO stole the gilt-plates from the door of the Capitoline Temple, and that another barbarian warrior carried off the gilt-plates from the roof, we must conclude that there was some affinity between the two classes of spoils. The surfaces of both may have been plain, or at least the plates on the roof were so, and they were valued by the vandals on account of the quality of the metal, which was supposed to be gold.

If we assume that metal plates were produced in quantities like encaustic tiles in our time, a vertical surface on one plane would form the most convenient base for their application. When closely and carefully laid, they would then be suggestive of a continuous plate of metal, and there is no doubt that sort of effect was sought after by the old builders. There seems to have been at all times an almost universal agreement that it is not fitting to ornament a door by engraved lines, as they would suggest a diminution of strength. Where, as in the old Byzantine door in the church of St. Paul outside the Walls, in Rome, the metal panels were engraved with figures and other pictorial subjects, the lines were afterwards filled in with silver. There are varieties enough among modern French doors, but it is rare that one sees a panel covered with incised ornament. The Romans were partial to applied mouldings and to metal bosses, for they enhanced the appearance of strength. As the people became effeminate, there was a desire for external aids to security, and hence chamber-doors were covered with bronze as well as those which opened on streets or grounds.

If doors are to serve only as defences, it would be logical to have as few planes as possible. The great door at Trani, which we represent this week, may correspond in treatment with much older examples. The panels could be plain, bevelled, or contain work in *repoussé*. As it is not easy to stretch metal in hammering, the relief in the Trani Gate is kept very low, but it is possible to obtain vigorous figures by the process. A door treated in a similar manner expresses its character, and, if detached from a building, its use can hardly be misunderstood.

From an early age, however, there was a desire to conceal the primary purpose for which doors were needed without diminishing the efficiency of them. SCOTT, with all his love for Border raids, does not forget to suggest that Newark's stately tower (with which his own race was associated) was never closed against the desolate and poor, although it often rolled back the tide of war. And if we revert to an earlier period, we cannot suppose that the beautiful ivory and gold ornamentation which was seen on the gates of the Temple of Minerva, at Syracuse, was entirely made up of elements that were intended to scare those who contemplated sacrilege. Numbers of Greeks found pleasure in writing about the beauty of those gates, and we may,



BRONZE DOOR, CATHEDRAL OF TRANI By Barisano.
(From a Photograph by Romualdo Moscioni, Rome.)

therefore, safely conclude they were not entirely suggestive of terror.

Whatever character was imparted to the bronze doors in Greek and Roman towns, it is never likely to affect the delight which is imparted by the Florentine gates of Ghiberti, or to diminish their inspiring power. Nothing is easier than to discover their weakness if tested by dogmatic theories. They are as defiant of accepted canons as Shakespeare's plays, but fortunately the world is not swayed by logic. Triqueti's gates in the Paris Madeleine are more consistent, but we doubt if one visitor in a hundred takes the trouble to notice them, while not one out of a thousand fails to enjoy Ghiberti's gates in the Florence Baptistery. It may appear a wrong to the earlier sculptor to couple such a name with his in a sentence, but one was as representative of convention as the other of liberty.

Ghiberti is not afraid to acknowledge that he executed his first gate under the influence of love of his art and discipline. It is evident that he was partly controlled by his respect for the work of Andrea Pisano, as if he asked himself how would that sculptor have treated the subjects if he could have had the benefit of the study of the antique like Ghiberti and his contemporaries? He tells us how he began with paintings of his subjects, and in his reliefs he endeavoured to at least equal what he had produced with the brush. In some panels he introduced nearly a hundred figures, and he did not hesitate to attempt architectural backgrounds and problems in perspective. He said simply, "I have represented the buildings as they would have appeared in their true proportions, and with so much truth that when they are regarded from a distance they appear to be detached from the ground." A door is an utilitarian object, but Ghiberti employed those with which he was entrusted as opportunities to display his art and to test the worth of his theories. That the metal-work is a protective fence is likely to be overlooked; such a purpose could be served as efficiently by the handiwork of a carpenter or a smith. Ghiberti felt he was employed because he was an artist, and as one he asserted the right to express his thoughts and realise his imagination. Neither the Signoria nor the Guild of Merchants, who conjointly commissioned him, are likely to be called to account in another world for their extravagance in setting up sculpture where plain boards would have served.

We must not expect that modern building-owners will often care to have bronze doors, but when one is discovered who can appreciate a work of the kind, it is to be hoped he will prefer the Florentine to the Trani precedent. The Liverpool Banking Company, when they approved of the experiment of Mr. Caröe and Mr. Stirling Lee, were as liberal as the old Florentines. St. John is not dominant in Ghiberti's gates, and the portraits that project are not Biblical. At Liverpool there is no puffing of commerce or banking, and the representatives of the fraternal spirit—David and Jonathan, Achilles and Patroclus, Castor and Pollux, Roland and Oliver—are not, we presume, portraits of the directors. The lower part is architectural in character, with the mouldings and details that can only be perfectly wrought when metal is used. The Adelphi Gate will bear comparison with the two which were designed by Alfred Stevens and Godfrey Sykes, and it is to be hoped that worthy companions will be found for them. A country in which so much metal is produced should be able to show all kinds of applications of the material.

EVOLUTION IN DECORATIVE ART.*

IT is my object this evening to describe in a brief and general way some of the changes undergone by art designs in their treatment, especially for decorative effect, and the causes which have brought about these changes, as illustrating the very many influences which affect the developmental history of patterns and designs generally. I shall also give a few instances in which the actual origin of certain ornamental designs can be ascertained and accounted for.

As, in the course of a single lecture, I can only hope to treat of my subject in a very general and cursory manner, it is necessary that the examples selected should be as simple as possible, and with this object in view I have chosen illustra-

tions for the most part from the art of the less cultured races of mankind, as the lower we go in the scale of civilisation the fewer agencies do we find affecting the growth of any particular art or industry, and consequently there is a diminished complexity with which to deal.

Before passing on to the main subject of my lecture, a few words regarding the early history of the art of design may not be amiss. It is when we endeavour to form conclusions as to the probable origin and early developmental stages of art that we are brought face to face with the consideration of the relationship of anthropology to archæology. These sciences are very closely allied; indeed, the two studies can hardly exist apart from one another, as each serves at times to elucidate points which are obscure in the evidence at the disposal of the other. The dominant idea in the two sciences is the same—to trace a continuity in the history of the human race, and to endeavour to form an unbroken chain of evidence to show the successive changes whereby man has arrived at his present state, both physical and mental. Anthropology, as dealing principally with the recent races of mankind, offers to archæology facts culled from peoples in various conditions of culture and physical development, peoples which variously exhibit, we believe, conditions of progress arrested or retarded at different stages in the general progressive evolution. The present is offered in explanation of the past, the living as representative of the dead. In the study of the history and gradual development of the art of design, more particularly in its earlier stages of growth, we feel very specially the need of something beyond the evidence supplied by archæology. This in no way gives an unbroken continuity, and of man's earliest efforts in plastic and graphic art we have no actual trace remaining. The earliest period at which we meet with relics of man's attempts in this direction belongs, it is true, to a relatively very remote age, when the mammoth and reindeer were conspicuous features in Central France, and the climate there was of that rigorous kind which suited these representatives of an Arctic fauna. Remote as was this so-called "Cave Period," we find from the associated relics of man's handiwork that human culture had in many ways already reached a considerable degree of development, that man already displayed not only ingenuity and dexterity in the manufacture of the implements of his everyday life, but also a skill and taste of no mean order in the art of design, as evidenced by his application of decoration to his implements. The often extremely clear and realistic sketches of the more characteristic animals, engraved upon pieces of horn, bone or ivory, or carved in complete relief as ornamental handles for horn daggers, show not only a keen observation and accurate knowledge of the animals portrayed, but also a considerable experience and adroitness in the use of the burin and the carving-tool of the period, even though these were but flakes of flint and such rude appliances. It is quite evident that the beginnings of art are not to be found here. In the still earlier period of the river drift gravels we find no traces of art-work amongst the remains of human industry preserved, and we are therefore unable, from actual relics of antiquity, to trace the history of this branch of æsthetic industry back beyond a period at which it had already reached a high state of development, which implies a long ancestry in the remoter past, of which we as yet know nothing.

In view of the lack of any archæological evidence as to the origin of the early development of the art of design, if we turn to the study of the living races of man we find that we may gather much that is suggestive and capable of throwing light upon the obscurity, and we are able to form some conclusions as to the probable succession of progressive changes undergone by art in the days of its infancy. In the life of the lowest or least cultured modern savage races we see reflected to a great extent the condition of primeval man, as has been ably pointed out by General Pitt-Rivers,* and a study of the condition of art among modern primitive folk cannot fail to illumine the obscure points in its actual early history in prehistoric times.

In examining the handiwork of these people, it becomes evident that their ideas are very largely derived from nature's suggestions. The forms of their implements are, for the most part, natural shapes, but slightly improved upon or adapted. We see also how readily curious or unusual natural objects are appreciated and valued and made to serve usually as charms, as being endowed with magic properties. In accordance with the "animistic" ideas of primitive man, those objects in nature which bear an accidental resemblance to some familiar thing, say an animal or the human form, are especially valued as having a kind of physical sympathetic relationship with the object whose form they simulate. One may readily believe that the rudiments of the art of æsthetic design are to be traced to the appreciation of the unusual in nature, associated largely with the primitive beliefs in the magical properties of such peculiarities. Strange shapes were eagerly sought for, and carefully preserved and valued according to the degree to which they were uncommon,

* A paper by Mr. Henry Balfour, M.A., read before the Applied Art Section of the Society of Arts, on Tuesday, April 10.

* "Primitive Warfare," *Journal of the Royal United Service Institution*, xi. No. 47.

or the extent to which they showed resemblances to familiar objects. In the Pitt-Rivers collection at Oxford is an Australian boomerang of yellow wood, cut out in such a manner as to exhibit along the central line a row of very dark natural knots in the grain, which occur at fairly regular intervals, and form an effective, though purely natural, decoration. Until recently natural boulders of peculiar shapes, especially if in any way suggesting the human form, were objects of worship to the Lapps. Of the many charms whose virtue lies in their resemblance to certain objects, I may mention the two-hooked *martynia* seed capsules, whose resemblance to the head and fangs of a poisonous snake has caused them to be used as charms against snake bites. In much the same way the kernel of a kind of chestnut—native of Demerara—(*Ophiocaryon serpentinum*), which resembles very curiously a little coiled-up snake, was assumed by the early colonists to be effective as an antidote to snake poison.

This merely "appreciative" stage can only be regarded as introductory to the origin of art, the actual germs of which appeared in the next stage. This new stage was arrived at when first the natural peculiarities or resemblances were slightly intensified by the application of artificial means to increase them. Where, for instance, an accidental resemblance to an animal's head was found, it would have been seen that the addition of a spot at the right place to represent an eye would greatly increase the resemblance; or by blackening the nodes on a reed stem, the decorative effect already suggested by the regularity with which these are naturally disposed would have been heightened. The first application of such slight improvements would not have required a great mental effort, and would have formed a perfectly natural sequel to the appreciation of the purely natural effects. As belonging to this "adaptive" stage, I may cite, as examples from modern life, the gnarled roots which the Chinese value for the weird resemblances which they sometimes bear to animals, and which the people touch up here and there in order to make the resemblance stronger, thereby producing very grotesque monsters. The mandrake roots sold in the Asia Minor bazaars as charms, by virtue of their resemblances to the human form, are, in reality, for the most part partly carved with a knife to enhance their value in the eyes of the ignorant buyers, who believe that they are of purely natural growth. I have a sealing charm which was carried by a Haida Indian, of Queen Charlotte Island, when seal-hunting; this is merely a natural pebble of elongated shape somewhat resembling a seal in outline. The hunter, in order to increase the resemblance, and, consequently, the value of his charm, added a circle, with a dot in the centre to represent the eye, on each side, and scratches to indicate the mouth.

In the earliest days, no doubt, the additional artificial touches were but few, and the natural effects but slightly increased, but as time went on the increasing use of artificial means to improve upon natural peculiarities doubtless led gradually to a stage in which the whole effects were produced artificially, and it was found that the effects could be thus copied. This brought the development of art to a definite "creative" stage, and, once man found that he could produce at will decorative effects or representations of objects, the real starting-point of art industry was reached, and a very wide field for the development of his æsthetic tendencies and imitative faculties was opened out. The magic powers of nature's accidental portraits were transferred to the artificial representations, though the peculiar natural forms were and are none the less eagerly sought for and valued as the more potent of the two kinds. At first, no doubt, it was nature's decorative patterns which were copied, before man more and more emancipated himself from his "mistress in art," and proceeded upon somewhat more original plans of his own. The three stages, appreciative, adaptive and creative, seem to follow one another in a perfectly natural sequence, and there can be little doubt that these represent the successive epochs in the early history of art, and our knowledge of modern savage life does, I think, fully bear out the probability of such a sequence, and help to establish this in relation to primeval man in his early crude efforts in the production of objects of art.

So far as representations of objects or portraiture are concerned, it would seem likely that graphic art was derived as a later development from plastic art, though this is largely a matter of conjecture. We know that solid shapes appeal more readily to the lowly cultured mind than do designs representing the same objects in the flat, and we can readily imagine a gradual evolution of graphic representation from the application of lines and fine incisions to express important details which were lacking in the solid representations of objects. The freer use of lines as a means of expression would in time have led to the discovery that the entire object could be represented in this way upon a flat surface, and with less labour than was required for carving or moulding figures in complete relief. In illustration I will take a case from the art of the Eskimo, though this in no way pretends to be actually a primitive transitional example, as the art of these people, both graphic and plastic, is highly developed. The little ivory thing is

carved into a shape representing the head of a polar bear, the details not expressed by the shape being added by means of supplemental lines—thus, the mouth, eyes, ears, &c., are supplied. On the reverse side we see that the bear's head has given place to a representation of a seal; but the shape of the piece is not so well adapted to express the outline of a seal, and we see that the supplemental lines have to convey more in this case than in the other; the lower part of the body and the limbs are drawn in, as they are not otherwise suggested.

How far the application of colours to flat surfaces influenced the early development of graphic art, as applied to outline representations of objects, it would be hard to say. We know that the use of colours in painting for decorative purposes was of great antiquity, and no doubt the habit of giving patches of colour definite shapes had some effect in assisting the growth of outline drawing, but into this I cannot now enter.

The few remarks which I have been able to make upon the general subject of the early history of plastic and graphic art, from a general standpoint, must necessarily convey very inadequately the points upon which I have touched. In dealing with so wide a subject it is unavoidable that one's remarks should appear sketchy and possibly unconvincing, but I am anxious to-night to give some account of the origin of individual patterns and art forms, and to put before you some of the factors which create changes in designs and cause these to be unstable and ever changing.

If I were to say that copying is one of the chief agents in creating variations in designs, I might be accused of dealing with paradoxes, but I should be quite justified in making the statement, and, as a matter of fact, I do make it. Man is nothing if not imitative, and the art of copying is perhaps one of his most useful accomplishments. But, even where every effort is made to produce an accurate copy of an original, in no case is the result an exact facsimile of the object copied. In estimating the value of copying, one must not undervalue the individuality of the artist. No two will copy an object in precisely the same manner and with the same result; there is always the "personal equation" to be reckoned with. In some cases this is very marked. Sir Robert Porter bitterly complains, in his "Travels in Georgia," of the inaccuracy with which sculptures were copied by archaeologists, and he gives in his book a plate showing copies of the same bas-relief by three different explorers. The results are so absurdly different that it becomes a compliment to Sir Robert Porter when we take his word for it that they are really intended to represent the same sculpture. It is certain that, if the ancient Persepolitan sculptor were to see them, and was able to recognise one of the designs as a copy of his own bas-relief, he would utterly refuse to hold the same view with regard to the other two copies.* This is, perhaps, an extreme case, but it is useful as illustrating the effect of the individual eye and hand in copying.

Suppose, however, instead of all being taken directly from an original, the copies are made successively one from another, the last copy of the growing series being in each case the model for the next. The changes produced by this process of successive copying are often very astonishing, and it would be difficult to over-estimate the importance of this process as an agent in producing variations in designs. This any one can try for himself; it is only necessary to give some design to be copied by a person whom I will call A, give A's copy to B to reproduce, B's to C, and so on, and it will be seen that while each may be a fairly good representation of the one before, as the series grows a marked difference between the original design and the last of the successive copies has arisen. The number of copyings required before any marked change is noticeable will, of course, depend upon the degree of skill of the copyists. A sketch representing a snail crawling over a twig, which I gave out to, for the most part, fairly unskilled hands to copy, successively went through a series of rapid changes, and became, in the course of some fourteen copyings, a kind of bird-like figure. The shell of the snail gradually left its owner, and crawled up the twig; the end of the twig became the head of the bird, the growth-rings becoming the eye; the eye-stalks on the head of the snail were metamorphosed into the forked tail of the bird. After the twelfth copy the design was copied upside down, as it looked more realistic so, and thus the bird came into being. Though the copies are not good ones, there is no striking difference between any two adjacent ones; but, nevertheless, there is no resemblance whatever between the first and the fourteenth, and, if seen apart from the series, no one would suppose them to be related.

In a similar manner a sketch of a Greek warrior became gradually, after nine or ten copyings, one representing a female figure, the collar-bones of the warrior having drooped more and more into a V-shape, till they became the edges of a cloak thrown loosely over the woman's shoulders, the warrior's muscles becoming folds in the cloak.

It may be urged that in skilful hands very little change

* The copies shown in the plate are by Chardin in 1674, Le Brun in 1704, and Niebuh in 1765.

would be noticeable, but I will give an illustration to show that even when skilled engravers have been the reproducers of a design, remarkable changes are apt to occur when the design is copied successively. The series which I give is one of four only, an original and three copies. The designs represent a ceremonial dance of the natives of Virginia in the sixteenth century. In each case I have only given a portion of the plate, showing a few figures only. The first, a photograph of the original water-colour drawing by John White, dating towards the end of the sixteenth century. The second from an engraving in De Bry's edition of Hariot's "Description of Virginia" (second or third edition, 1634), this having been taken from White's drawing and reversed. The third from Lafitau ("Mœurs des Sauvages," II. pl. 6, 1724), copied from De Bry's plate and reversed back again. The fourth from an engraving in Sir John Lubbock's "Origin of Civilisation," p. 248 (1875), copied from Lafitau. Now let us look at the figure in the centre of the original drawing, slightly turned towards the right. A gourd rattle is held in the left hand for shaking as an accompaniment to the dancer. This we see plainly in De Bry's reversed, but excellent, not to say idealised, engraving. In Lafitau's engraving the gourd is still there, but badly represented, very darkly shaded on one side, with but a faint line to represent the outline of the gourd on the other side. This faint line escaped the notice of Lubbock's engraver, and he represented the figure as clutching the shading only, literally "grasping a shadow," most unsatisfactory for the dancer. The figure dressed in leafy bough in the original holds a small branch in his right hand; this appears as a gourd rattle in the copies; perhaps this compensates somewhat for the loss of the other dancer's rattle. Such changes as these are, I supposed, considered permissible under the plea of "engraver's license," but when the letterpress, too, becomes bitten with the same craving for change, and endeavours to follow and keep pace with the erratic metamorphoses of the illustrations, it is, perhaps, going a little too far. The upright columns, which in the entire design can be seen standing in a circle, are described in Hariot's original work as "posts," and in De Bry's Latin translation as "tigna." They are clearly of wood, and are so represented in De Bry's engravings, where very evident knots in the grain are seen; these are hardly shown in Lafitau, and his careless representation has led to the materials of the posts being changed in the later description. Sir John Lubbock has, in fact, petrified these posts, and we read in his reference to the illustration as follows:—"It is very interesting to see here a circle of upright *stones* [my italics], which, except that they are rudely carved at the upper end in the form of a head, exactly resemble our so-called Druidical temples." I would draw special attention to the fact that all the changes mentioned in this case have occurred in the course of three successive copyings only. One shudders to contemplate what would have occurred in fourteen or twenty. These examples will suffice to show how very great may be the changes wrought unintentionally through the agency of successive copying, and how very necessary it is, where possible, to go direct to the original source, whether for illustrations or descriptions. The rate at which change will take place varies necessarily with the skill and care exercised by the artists and the relative difficulty of the material and other details of circumstances, but, whether the copyists be inexperienced and unskilled, or whether they be the leading artists of the day, the changes would still be seen, though in the one case a longer series would be required to effect any radical change in the design, the difference between any two adjacent copies being far slighter in the case of skilled artist's work. Where designs have been reproduced from memory we can readily understand that still more marked variations from the original will occur. Such changes as are produced unintentionally through carelessness and the impossibility of copying quite accurately, are due to what I have called unconscious variation. But active as is this process as a factor in producing change, it is usually accompanied and the change is accelerated by the still more active and unrestrained agent, conscious variation. In the reproduction of ornamental patterns there is often a desire to vary or to improve upon the design copied. The motives for this intentional variation are many and various, and while sometimes the changes are merely to suit the individual taste or are due to caprice on the part of the artist, at other times they are of a more strictly utilitarian nature.

(To be continued.)

The Council of the Leeds and Yorkshire Architectural Society for the coming year will consist of the following members:—President, Mr. E. J. Dodgshun; vice-presidents, Mr. W. Watson and Mr. W. Carby Hall; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. W. H. Beevers; hon. sec., Mr. F. W. Bedford; ordinary members, Mr. H. B. Buckley, Mr. J. N. Greaves, Mr. W. A. Hobson, Mr. G. F. Danby and Mr. James Ledingham; auditors, Mr. A. E. Kirk and Mr. H. S. Chorley.

TESSERÆ.

Perugino at Panicale.

ON one of the wooded hills rising above the lake of Perugia stands the small town of Panicale. Its half-ruined walls and towers show that it was a fortified post of some importance during the Middle Ages. Away from the high roads leading to the principal cities of central Italy, it is seldom visited by the traveller, who would scarcely find in it the miserable shelter of an Italian "osteria." Yet, like almost every town and hamlet of this favoured land, it contains works of art such as elsewhere would render a city famous. Outside the walls, on an olive-clad eminence overlooking the town, is a convent of nuns. Attached to it is a chapel dedicated to St. Sebastian. The wall behind its high altar is covered with a fresco representing the martyrdom of the saint. It is the work, and may be ranked amongst the finest, of a painter who by his genius and the influence he exercised upon his great contemporaries, forms an epoch in the history of art—Pietro Vannucci, or as he is more commonly called, from the city in which he principally laboured and founded his school, "Il Perugino." This noble work, although mentioned in most lives of the painter, is unnoticed by his first biographer, Vasari. It has consequently been overlooked even by those who have made the history of the art of his period a study. Of the numerous works of Pietro Perugino there is scarcely one that displays to greater advantage the peculiar characteristics of the master, the delicate tenderness of his colouring, the grace, verging on weakness, of his forms, the exquisite purity and sentiment of his heads, the general correctness of his drawing, and his somewhat scattered composition. It has all the best qualities of the Umbrian School, inherited by Pietro from his first instructors in the art, Benedetto Bonfigli, of Perugia, and Niccolò Alunno, a native of Foligno, whose altar-pieces, remarkable for their glow of colour and the simple beauty of their holy groups, still adorn the churches in the valley of the Tiber. But in it Pietro shows at the same time that he has been imbued with the spirit of that great school which flourished in Florence and whose teachings he had early sought. It has less of his weakness and mannerism and more of his strength than most of his paintings, displaying those qualities which the genius of his immortal pupil at once culled from his works. The martyr occupies the centre of the composition, and forms the principal object in it. He is bound to a porphyry column raised on a pedestal. The exquisite proportions of the figure, the admirable delineation of all its parts, show the study devoted by Pietro to the human form. The tender expression of devotion in the upturned head, slightly inclined over the right shoulder, is peculiar to the school, but does not in this instance degenerate into affectation. The painter has united in this beautiful figure without exaggeration the utmost grace with the deepest religious feeling. A more perfect and touching representation of the Christian martyr could not be conceived. On the pedestal supporting the martyr is inscribed the name of the painter, and on the pilasters of the arcade the date 1505. Pietro was then in the fifty-ninth year of his age. About ten years previously he had settled in Perugia, after his fame had been established by the execution of great works in Florence and in Rome. The city had conferred upon him the right of citizenship, and had even raised him to the dignity of one of its ten "Priori," or magistrates. During these ten years he had painted his finest pictures, amongst them the altar-piece for the Certosa of Pavia, now in the National Gallery. In Perugia and the neighbouring towns he decorated the principal buildings and churches. The celebrated frescoes in the "Cambio," or Exchange, and the adjoining chapel were executed in 1500; the *Adoration of the Magi* at his native place, Citta della Pieve, in 1504. His powers were at their height when he painted the *Martyrdom of St. Sebastian* at Panicale. At this time the fame of his school had spread through Italy, and had brought to him his most distinguished scholars, L'Ingegno, Lo Spagna, Tiberio d'Assisi and many others, whose paintings have been so frequently confounded with those of their master. They aided him in his great undertakings, and rendered them perfect and complete in their most minute details. Before he executed the fresco at Panicale, Raphael had already left him, and was probably painting at Florence or Siena. Consequently, there are no traces of his pencil in it. It is important to mention this fact, as there are parts of the picture which might otherwise be ascribed to that great painter. There is no record of the sum received by Pietro for the Panicale fresco, but there is a curious correspondence still preserved in the archives of Perugia relating to it. From these letters it appears that in the year 1507, or two years after its completion, the people of Panicale sent an emissary to the painter, requesting him to lend the commune some standards of silk painted with figures, to be carried in the annual procession of the "Corpus Domini." Pietro offered to paint fourteen expressly for the festival, on condition that they should be returned unless the balance of eleven florins, owing to him for the fresco of the *Martyrdom of St. Sebastian* were pre-

viously paid. The Panicaese accepted the offer, and a receipt, dated September 1 of the same year, shows that they paid the money and kept the standards. This is an instance, among many that could be cited, of the liberality of a painter whom Vasari accuses of meanness.

The Architecture of Madrid.

Madrid is, by some centuries, the youngest capital in Europe, St. Petersburg excepted, as it cannot be said to have been founded before the sixteenth century by Charles V. It in consequence is deficient in ancient architectural monuments, in Roman, Moorish, Gothic, or even Cinquecento art. It possesses no Notre Dame or Louvre and Tuileries, like Paris. It has no Westminster Hall, Westminster Abbey, no Tower, no Whitehall Banqueting House, like London; and is unfortunately rich in Rococo, which was the reigning style at the earlier period of its erection. It is, besides, the smallest capital of a great nation in Europe. Nevertheless, it has some architectural features superior at least to London. We have no street in London, nor yet, indeed, is there in Paris, which can vie with the Calle de Alcalá in its noble expanse and its varied succession of buildings of sumptuous or stately architecture. There was a sort of reaction in the architectural taste of Spain before the middle of the eighteenth century, the first native who opposed successfully the Churrigueresque style being Ventura de Rodríguez; he fortunately, with his followers, led back to a more severe and correct style of design, which became extremely popular and beneficial to the architectural display of Madrid. He was the founder, in fact, of the modern architectural taste of Spain existing to this day. No metropolis in Europe presents a royal palace which, taking all things into consideration, can vie with that of Madrid. It was erected for Philip V. by Juvara, a Sicilian, and Jachetti, a Turinese, to whom with Sabatini, also a Sicilian, Rodríguez and Villanueva, Madrid owes her best architecture. Its style is Italian; it is square, each of its fronts being 470 feet in length by 100 feet high. It is built of white stone, with a rustic base of granite. It encloses a magnificent court, and is of itself a building of the utmost importance; but there is an inexpressible charm given to it by its extraordinary site, and that site the more extraordinary as being connected with a busy and populous city. This sumptuous pile towers over a country grand in its wildness, and closed by the magnificent range of the Guadrama mountains. It forcibly recalls to mind some of those finest works of Claude Lorraine, where noble and elegant fabrics of Italian architecture are surrounded by and contrasted with nature and her grandest features in the expanse of the boundless sea, or the vast and luxuriant wilderness closed by the rolling Apennines, forming a whole fraught with poetry. The most considerable work of Villanueva is the Museo (the National Gallery) of Madrid, beautifully situated on the Prado. It is of red brick, ornamented with granite. The principal façade—although in some respects open to criticism, as being flanked by two projections in the manner of bastions, tending to injure the harmony of the outline—is a work of considerable merit. In the centre is a hexastyle portico of Doric, flanked by two Ionic colonnades of incomparable beauty, and the Ionic temple which forms the lateral, *i.e.* the principal, entrance is unrivalled in beauty and fitness. The vast circular hall of entrance, from which open the entrances to the various galleries or schools diverging from it, is one of the noblest and most appropriate of designs.

The Interior of St. Peter's, Rome.

On entering St. Peter's every observer is astonished that its dimensions appear so much less than they really are. This has been attributed to the justness of the proportions of the building, and strangely enough has been adduced as a merit. On a very little consideration this must appear a most extraordinary error. If indeed it be owing to the proportions of St. Peter's that it appears less than it is, this must be considered as a proof, not that its proportions are exactly what they ought to be, but that there is something wrong about them; for its magnificent dimensions are generally and justly regarded as one fit cause of our admiration, and therefore that must be thought a defect which conceals their immensity. If, on the other hand, it be a merit in the proportions of St. Peter's that they diminish to the eye its real size, then that size must be a defect, and the expense and labour of producing it must have been more than wasted. In truth, however, the justness of the theory which attributes to the general proportions of a building, unassisted by its darkness or lightness, the power of diminishing or augmenting the whole magnitude of a building may be doubted. The true cause of the apparent diminution of St. Peter's, in part at least, may be the great magnitude of the numerous statues in the church. These are, in fact, all colossal, and as our eye is accustomed to statues more near the size of life, they serve as a false standard by which we measure the church in which they stand. Statues of white marble have also, from their brilliancy of colour, the appearance of being much nearer to the eye than they really are, which must of course diminish their apparent magnitude and render the scale afforded by them still more fallacious. The great light of

St. Peter's, especially when contrasted, as it will be involuntarily by all foreigners, with the gloominess of their own Gothic cathedrals, contributes to the same effect of reducing its seeming dimensions. On the whole the interior of St. Peter's is very handsome, but it is to be regretted that the entablature over the pilasters of the nave is so much broken, and that the beautiful frieze, which is over two of them, has not been continued. As it is, it only serves to make the deficiency more striking. There is also too great a mixture of differently coloured marbles in the arches that support the nave, and the capella papale is certainly a disgrace to so noble and generally simple an edifice. It is a singular circumstance that the tall fluted and reeded Corinthian pilasters between the arches of the nave are only painted in imitation of white marble. The retrenchment of some of the superfluous ornaments of the church would probably have sufficed to have made them what they pretend to be. The cupola would be rendered more beautiful by continuing the entablature over its pilasters, but it would perhaps add too much to the weight for the security of the building. After all, the continuance of an internal entablature is of much less importance, as, in truth, any cornice within a building is rather a solecism, it being properly and originally the projection of the roof, and therefore Milizia suggests that it would be better in the interior of a building to omit the cornice altogether, making use of a simple frieze.

Florentine Associations.

Though few societies have had a Thucydides to write their history, or have had their daily life stereotyped by writers with the dramatic power of Plato and Demosthenes, any attempt at really comprehending Athenian society must fail. But in the case of Florence this is possible, so far as it can be possible with any community a few hundred years removed from our own. Live in Florence for a year, saunter daily in the Piazza della Signoria, worship in St. Mary of the Flower, traverse early in the morning the streets of the Mercato Vecchio, and if you have a good knowledge of Italian and an affable manner you will soon feel that you would be perfectly at home in the Florence of Corso Donati. The Siennese a few years ago were unwilling to come to Florence lest they should encounter the memory of the defeat of Montaperti. The name Cerretiere still bears witness to the loathing and abhorrence felt for the traitorous creature of the Duke of Athens. The ground on which Savonarola suffered martyrdom was till the last century strewn with flowers on every anniversary of his death. The same old customs and ceremonies are still kept up on the same days, except that St. John's Day has given way at last to the festival of Italian Unity. Indeed, every step a Florentine takes through his native city reminds him of some event in his country's history. There is scarcely a church or a palace or a convent or even a room where anything important in Florentine history was transacted which does not still remain in its original state. To one standing on the Piazza, which after several changes has returned to its original name, the wall of the public palace marks by its distorted outline the unholy ground on which the abode of the Uberti stood—those traitors to the cause of their country whose treason was scarcely atoned for by the noble firmness of Farinata. The post-office by its name, *Tetto dei Pisani*, recalls the temporary defeat of that great city which was still for many years to be a rival to Florence. The public palace itself still contains the room in which the council of the signory debated for two hundred and fifty years the affairs of the republic, the chapel where the *émeute* of the Ciompi was first divulged, and the "little chamber" in the tower where Cosmo dei Medici was imprisoned—an event which was the beginning of the end of the republic. The church which Dante called "*il mio bel Giovanni*" remains as beautiful as when he looked upon it from the stone which still marks the place of his meditations. At the doors are the porphyry columns which Pisa gave to Florence in the days when they were not sufficiently equal to be rivals. These instances might be multiplied indefinitely.

Ammonius Saccas (A.D. 175-250) on Architectural Logic.

In general the end of theory is the beginning of practice, and so, reciprocally, the end of practice the beginning of theory. Thus, for instance: an architect, being ordered to build a house, says to himself, I am ordered to build a house, that is to say, a certain defence to protect against the rains and the heats. But this cannot be without a roof or covering. From this point therefore he begins his theory. He proceeds and says:—But there can be no roof if there be no walls, and there can be no walls without some foundations, nor can there be laid foundations without opening the earth. At this point the theory is at an end. Hence, therefore, commences the practice or action. For first he opens the earth, then lays the foundation, then raises the walls, and lastly puts on the roof, which is the end of the action or practice (but beginning of the theory), as the beginning of the practice was the end of the theory.

NOTES AND COMMENTS.

A CONTRACT-DEED relating to the building of the parish church of Oldham, and dated November 4, 1476, was exhibited at the last meeting of the Lancashire and Cheshire Antiquarian Society. Mr. J. P. EARWAKER, in introducing it, said the contracting parties were Sir RALPH LANGLEY, the rector of Prestwich, and three masons. The sum to be paid for the body of the church was 28*l.* 6*s.* 8*d.*, an amount which was significant of the high value of money at that date. The work was to be done mainly by the contractors' own hands, and 2½ years were allowed for its completion. In case of disagreement other masons were to be called in, whose decision, given according to "faith and conscience," was to be binding upon both sides. Contract-deeds relating to buildings are very rare. This particular one is in English, and contains some uncommon words. The church stood till 1824, when it was taken down and rebuilt.

THE competitors who sent in designs for the Hammer-smith Town Hall were mainly local architects, viz. Mr. T. GARRATT, Mr. H. R. GOUGH, Messrs. ISAACS & FLORENCE, Mr. G. W. MOUNTFORD, Mr. W. G. PERKINS, Messrs. PUGIN & PUGIN and Mr. J. H. RICHARDSON. In his report on the designs, Mr. EMERSON stated that plan A (Mr. RICHARDSON'S) was undoubtedly the first in order of merit and best complies with the conditions. The town hall committee have recommended the adoption of the design, subject to such modifications as may be required by the London County Council and the Vestry, and that the cost will be about 25,000*l.* The vestrymen are almost equally divided about postponing the time for arriving at a decision, and it was agreed that the proposal should go back to the committee for a fortnight. The successful design is Renaissance in style, freely treated, and would be executed in red brick with Portland stone dressings. The roofs would be covered with permanent green slates. Blue lias concrete, hard stock bricks for general work, blue bricks for piers carrying great weight, built in cement. Marble mosaic floors are designed for corridors, and hard York stone for all stairs. The timber for carpentry would be the best Baltic Memel fir. It is proposed to execute the work in a plain substantial manner but with an eye to artistic effect.

THE palace at Laeken, near Brussels, which was in part destroyed by the fire on January 1, has been carefully restored and where necessary rebuilt. The building is not ancient—for it only dates from 1782—but it has acquired historical interest. It was constructed as a summer residence for the Austrian Governors of the Netherlands. The Archduke ALBERT OF SAXE-TESSCHEN, who held the appointment at the time, was an amateur, and he drew designs for the palace which were put into a definite shape by MONTOYER, the architect. The style was Classic, the portico had Ionic columns, and in the pediment was a relief by GODECHARLES representing Time presiding over the hours, days and seasons. The palace was acquired by NAPOLEON, who presented it to JOSEPHINE. It was there he signed the declaration of war with Russia, which led to the downfall of the Empire. Eventually it came into the possession of LEOPOLD I., who preferred it as a residence to the palace in Brussels. The present King of the BELGIANS has, like his father, laid out large sums on the improvement of the place. The restored building differs little from its predecessor, except in additions for the comfort of the residents. The grounds were originally laid out to resemble an English park, and during the coming summer they are likely to receive the admiration of thousands of visitors.

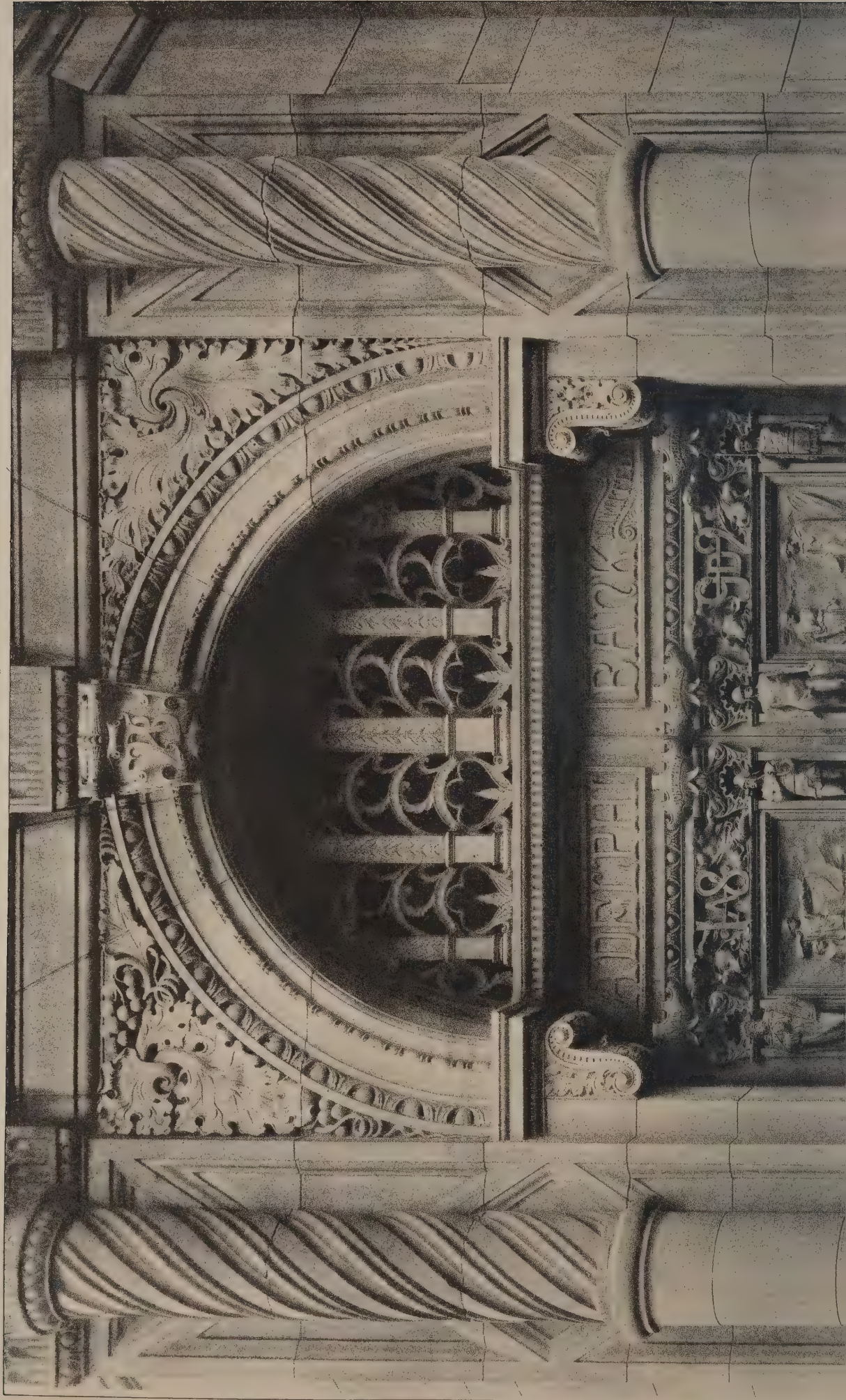
WHAT are "les hautes études architectoniques"? The phrase was undoubtedly derived from the French circus, but what it signifies in building is not easily defined. Every architect naturally attaches importance to his humblest work, and it is not generally admitted that costly structures alone are entitled to be considered as examples of high art or of purity in style. The difficulty of defining "hautes

études" has caused the Prix Duc, which is worth 150*l.*, to be going a-begging. There is more or less presumption ascribed to any architect who sets himself up as a competitor for the prize, and in consequence, this year there is not one eligible applicant. The late M. Duc was, we believe, a humourist, and disposed to enjoy the weakness of his contemporaries. He may have instituted the prize for the gratification of men like himself, who could enjoy the professional comedy in succeeding ages. There is, however, a possibility that the character of the prize will be altered. A sum of 150*l.* a year is too large to be left unproductive in France, and accordingly, at the sitting of the Académie des Beaux-Arts on Saturday, M. ALFRED NORMAND inquired whether some modification of the conditions could not be arranged with M. Duc's family. That is the first step towards a change. It is possible to pay too much for a good joke, and it would be better to apply the money to another use than in the creation of a band of men who can be chaffed by their fellows. But the surest way out of the difficulty would be to take a hint from London and assign the Prix Duc to painters.

ALTHOUGH the World's Fair, at Chicago, has been relegated to the region of antiquity, the French Government have not forgotten the services of the French artists who have contributed to it. The following have been elevated to the rank of officers of the Legion of Honour:—M. JEAN BÉRAUD, painter; Mdle. ROSA BONHEUR, who is the first lady to attain this distinction; MM. LHERMITTE and LUMINAIS, painters; BOUCHER and MARQUESTE, sculptors; LEOPOLD FLAMENG, engraver; and MASSIER, artist in pottery. The following chevaliers are also appointed:—MM. AUGUIN, JEAN BENNER, VICTOR BINET, BORDES, BROUILLET, BULAND, DELACROIX DE RICHEMOND, GUILLON, CLAVEL or IWILL, MAURICE LOLOIR, AIMÉ PERRET, RENOARD, painters; DAILLION, LABATUT, LOMBARD, sculptors; BRUNET-DEBAINES ET LÉVEILLÉ, engravers; FRANTZ JOURDAIN and SANDIER, architects; TAXILE DOAT, superintendent at Sèvres; MUNIER, superintendent at the Gobelins; LACROIX, superintendent at Beauvais; BRATEAU, goldsmith; JOSEPH CHÉRET and DELAHERCHE, artists in pottery; and RAULT, carver. It will be observed that among so large a number of artists only two architects have been recognised.

IF all the opponents of the London Streets and Buildings Bill are to be represented by counsel, the Parliamentary Bar will have no reason to complain of the present session. The sign-painters of the Metropolis are among the latest who have taken up arms against the proposals of the County Council. Their ground of complaint is section 176, which prescribes that "any boards, frames, plates, tablets or other like structures, attached after the commencement of this Act to the external walls of buildings for the purpose of advertisement, shall be constructed of fire-resisting materials throughout." It appears that within the metropolitan area there are about two hundred masters, who are supposed to employ a thousand men as painters, glass-writers, carpenters and labourers. That number may not appear of much importance in Spring Gardens; but the industry is important, especially as it is one of those in which apprenticeship is needful. It is not very clear how fires can originate in wooden signboards, and if the fire arises within a building, it must have made some progress before the signboard is in a flaming condition. At that time it is not of much importance whether the signboard is inflammable or the reverse. The painters say there would be no objection raised by them if the size of boards were restricted, so that windows need not be blocked, and they would co-operate in carrying out stringently all regulations to insure the safety of the public. That signboards are too obtrusive in London is undeniable, and it would aid architectural effect if more modest dimensions were demanded. The risk of danger would be diminished by that sort of arrangement. As long as wood is employed there is, however, a chance to obtain some variety in lettering; but if fire-resisting materials are used, there will be sameness in the signs, and when houses are not uniform that would not always be an advantage.

Öhrn Årsförest. April 13^{de} 1894.



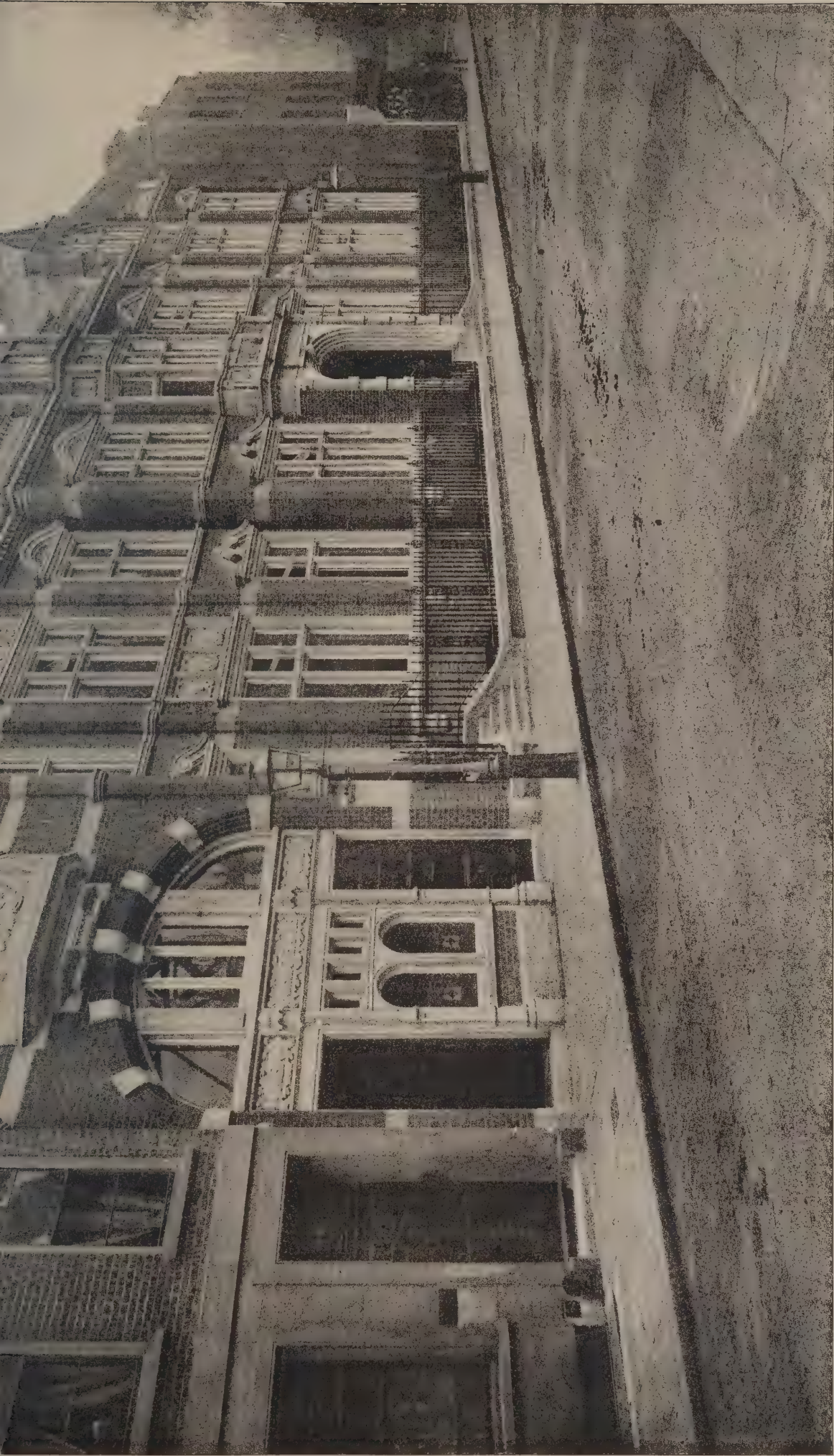
MIDLANDER CHURCH, DUBLIN.

The Late Andrew Hector Archt^l Parish.



Die Architekt, April 13th 1894.





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ILLUSTRATIONS.

ADELPHI BANK, LIVERPOOL.—THE BRONZE DOORS.

BATHS AND LIBRARY, GREAT SMITH STREET, WESTMINSTER.

REREDOS, PONTARDAWE.

THIS reredos is now being erected to the memory of the late vicar, the Rev. DAVID JONES, and also the late curate, Rev. T. E. DAVIES. The centre canopy of the reredos is richly cusped and moulded, and terminates with a carved stone cross. On each side of the canopy are two niches, with the figures of St. PETER and St. JOHN. The centre portion is filled in with gold mosaic, and the Agnus Dei above in green and white mosaic. The arches on each side are supported with Numidian marble columns, with Irish green marble slabs at back. The stone is Caen. The whole of the work is being carried out from the designs of Messrs. WILSON & MOXHAM, architects, Swansea.

FINDLATER CHURCH, DUBLIN.

ARCHITECTURE AND ITS CIVIC AND COMMERCIAL VALUE.*

SOME time ago a client asked me if I would explain one thing as to which he was in doubt. It was, When was a building merely building, and when was it entitled to be considered architecture? I explained as well as I could in the limited time at my disposal. The reason I mention the incident is because it led me to think, if he wanted information, may not many others? I tried to remember if any lecturers had dealt with the subject; I could not think of any. It is such a pleasure to a lecturer to find a portion of a subject that is new that I determined to try what I could do with it. I could, of course, give definitions easily enough, but how could I by diagrams bring home practically the distinction to non-professional minds? I prepared some diagrams and used them at the opening lecture at King's College. Since then I have made more, and I trust sufficient to fully illustrate this part of our subject.

I propose (1) to show you how architecture can be reduced to mere building. (2) Then, reversing the process, to show you a drawing of mere building, and then drawings showing how such building may be treated so as to make it partake of architecture. (3) Next I will give you an illustration as to the treatment of the simplest form of building—the cottage—and how some character may be given to it. Afterwards I propose to ask you to consider with me one essential element, without which there can be no good architecture, namely, proportion; and then we shall take a rapid survey of the characteristics that distinguish the architecture of the different nations.

As I trust we shall all then understand what architecture is, we will deal with (1) its civic, and (2) its commercial value.

Probably the best, the clearest definition is one I have given on a former occasion:—"Architecture has a definite object over and above that of giving pleasure. She has to serve the needs of man, and is therefore a useful art as well as a fine art. Architecture, therefore, recognises utility as the basis of her work, on which she erects a superstructure of her own with grace of proportion and beauty of ornament. Without such additions, utility alone would give us, not architecture, but only building."

Some think that architecture means elaborate decorations, carving and ornament. Even that well-known author, Mr. Fergusson, in his analysis of architecture, appears to lay too much stress on ornamentation when he says:—"Architecture is nothing more or less than the art of ornamental and ornamented construction."

It recalls to my mind a building, the ground floor of which was Grecian, the first floor Roman, the second floor Italian, and the roof and turret Gothic—all built without the slightest regard one for the other. It was certainly ornamented construction, but one does not wish to see such another example. No, bear in mind that mere ornamental building cannot satisfy the taste. There must be proportion, without which no building can please, and this is the next division of the first part of my subject.

All-important in architecture is proportion. As I have said, I can hardly lay too much stress on this requirement. You may ask, Are there no rules to help us? Did not the architects of antiquity and the Mediæval ages have any to guide them in obtaining the glorious proportions we see in their buildings? No doubt they had rules, but as we have no record we can

only by measurements of the building endeavour to find out what they were. For example, three different systems have been given to the Egyptian pyramids:—(1) the triangle; (2) the astronomical; (3) the ten horizontal to nine vertical.

No matter how the proportion is arrived at, we shall not be wrong in drawing the conclusions: (1) A building without proportion is utterly, hopelessly bad. (2) A building, no matter how simple, if in proportion, is good and pleasing. (3) A building in good proportion and with ornamented construction is to be desired, and will give much pleasure. As, therefore, no amount of ornament or even ornamented construction is of any avail in producing a pleasing effect without proportion, proportion is the very life-blood of architecture. To test whether designs would look well in execution, it has been suggested to wash the perspectives all over with a dark tint of Indian ink, so that only the outline would be left (like, in fact, as it would be seen in a London fog), the opinion being that if the design then looked well, it was certain to be a success.

I have not time to speak of the addition to proportion of beauty. You can easily imagine how such addition produces perfection in architecture.

I next have to explain the leading characteristics of the different styles. The original dwellings of man, as you no doubt know, are divided into three classes by Gwilt:—1. The cave, for the hunter and fisher. 2. The tent, so often mentioned in the Bible, for the shepherd. 3. The hut, for the agriculturist.

I will only give you a few drawings of the cave. One called the Tiger Cave is very remarkable, although not so extensive as the cave at Karli, which is on the road between Bombay and Poonah (formed 100 B.C.). The latter is 126 feet in depth, 45 feet 7 inches in width, and 45 feet high in the centre, with fifteen pillars on each side, dividing it into nave and aisles, and it has also a circular apse. The Tiger Cave is curious, because its extended jaws form a verandah leading to a small compartment within.

I may mention that nearly all the cave excavations in Egypt are tombs (I show you many illustrations placed on the walls). In India they are formed as dwellings, temples and monasteries. In Asia Minor the caves are in many examples decorated with a façade of the Ionic or other types.

Let us pass to Egypt. The Egyptians, I should mention, were pre-eminently a building race, and our knowledge of their entire history is due to the records they have left in and on stone. Their pyramids were erected 3,000 to 3,500 years B.C. It has been well said, the monuments of Egypt give life and reality to their whole history. It is impossible for any educated man capable of judging of the value of evidence to wander among the pyramids and tombs of Memphis, the temples of Thebes, or the vast structures erected by the Ptolemys and Cæsars, and not to feel that he has before him a chapter of history more authentic than we possess of any nation at all approaching it in antiquity, and a picture of men and manners more vivid and more ample than remain to us of any other people who have passed away.

Again, you cannot examine the interior of the Great Pyramid without being struck with astonishment at the wonderful mechanical skill displayed in its construction. The immense blocks of granite, brought a distance of 500 miles, are polished like glass, and so fitted that the joints can hardly be detected. The leading characteristic is enormous solidity of construction. It may well be said they built for eternity. In proof, look at the photo. of the building at Karnac, which is considered the finest. Fergusson says:—"All combine to stamp this as the greatest of man's architectural works; the twelve central columns which rise to the top of the clerestory are so large that 100 men could stand on each cap without crowding."

Next in antiquity is the Assyrian style, which dates from 1341 B.C. to 332 B.C. The form of building is of the heavy massive type, relieved with glazed tiles and bricks—I give two examples, Nineveh and a fishing pavilion, taken from the sculpture at Khorsabad. These exhibit all the parts of an Assyrian order with its entablature. The period is more than 1,000 years later than the Pyramids. I show one illustration of the difference in stability between the Assyrian and the Egyptian. It is that of the walls of Babylon, which were 390 feet high and 90 feet thick; there is now practically nothing left.

The great charm in Grecian architecture is the refinement of line, as exemplified in the Parthenon erected at Athens about 400 years B.C. It is considered that Grecian architecture, in this building, reached its highest perfection and beauty. In sculpture, also, we find a great advance; the conventional figure of the Egyptian and Assyrian period is gone and we have work unrivalled in any country and in any age.

Pause a moment to think that some 2,000 years ago perfection was attained; at least, the work is still the admiration of the world. And it adds to our wonder if we recollect that all these glorious works were accomplished in the short space of 150 years.

The language of Mr. Fergusson, in speaking of the Par-

* A lecture by Professor Banister Fletcher, delivered at the National Building Exhibition.

thenon, may seem excessive praise, yet we may venture to agree with him :—

"It is undoubtedly the most beautiful building in the world. It is true it has neither the dimensions nor the wondrous expression of power and eternity inherent in Egyptian temples, nor has it the variety or poetry of the Gothic cathedral; but for intellectual beauty, for perfection of proportion, for beauty of detail and for exquisite perception of the highest and most recondite principles of art ever applied to architecture, it stands utterly and entirely alone and unrivalled, the glory of Greece and a reproach to the rest of the world."

We pass now to a very different character of art. Roman architecture was not matured, like the Grecian, in peace, but in war and conquest. Rome, you will remember, from the possession of the Seven Hills, gradually carried her sway at the edge of the sword over all Italy and the entire then known world, seeking only, it has been said truly, the acquisition of wealth and power. Then, and not till then, she became the centre of all the arts and of all the sciences, and more numerous and larger buildings were set up in Rome, and her dependent cities, than have ever since been erected. The architecture displayed greatness in the mass, grandeur in the conception, and an expression of power, whilst it lost the refinement and grace of the Grecian.

The next style is the Romanesque, a modification of the Roman forms, in order to adapt them to Christian purposes. In Italy and south of France this style continued to be practised till the sixth or seventh century.

In Western Europe architecture on the dissolution of the Roman Empire seems lost for a time. And history next brings us to the same Romanesque architecture which was used by the Western barbarians, who overthrew the Roman Empire. In England we know the Romanesque style by the name of Norman.

I have now indicated to you how the styles of architecture arose from the early caves, tent and hut, and in so doing have dealt all too briefly with so much of the history of the world as is written in stone.

Time will not permit us to deal with the development of the Gothic, except to mention that the progress of Gothic in England after the Norman is called, first, Pointed or Early English, next Decorated, and last, Perpendicular. The period of this last style is the fifteenth and sixteenth centuries. Nor may I stay to treat of the glories of our Gothic churches and cathedrals. I can only remind you of the words of Madame de Staël. Speaking of them she says:—"A cathedral is a glorious specimen of thought in stone, whose very windows are transparent walls of gorgeous hues."

With regard to Saracenic, Etruscan, Renaissance, Indian and Chinese, all I can do is to invite you to look at examples.

I have already mentioned the subject of application. I have long thought that a lack of idealism is the great defect of the present day. We work, and rightly too, for material improvement, betterment of social conditions, &c., but surely at the same time we ought to work for something else. Might not that something else be to endeavour to make the city we live in the most pleasing, aye, even the most beautiful, in the world? And this brings me to the next division of the subject, to the value of civic architecture.

You to whom I am speaking must in time be among those who govern the policy that can help forward or mar this ideal. Try, then, to get rid of the too common conditions of building. Most people say, "I want a certain quantity of space covered in and certain showy ornament, and it must all be done at such a sum." Do you imagine that that was the way they built the glorious buildings the mere illustrations of which have, I hope, given us so much pleasure to-night?

As I propose only dealing with what civic authorities can do, I must eliminate all works of architecture which possess value from age. As, for example :—(1) The glorious pyramids and architecture of Egypt; (2) the old temples and architecture of Greece and Rome; (3) the beautiful cathedrals of the Middle Ages. Also those which possess value from old association, such as Shakespeare's House at Stratford-on-Avon and Holyrood Palace, because their value is due to events that cannot be created by civic authority. I do so because my object is to show you to-night that architectural outlay may be profitable, that municipal and other authorities may do worse with the money at their command than spend it in the architectural adornment of their cities and towns; and clearly it is necessary to omit from our consideration buildings they cannot now create.

Well, let me give my illustration. Formerly Paris attracted visitors by its beautiful thoroughfares and buildings. London at that time was only a place of business, which all left who could. I will not dwell on what London was, as it is not a pleasant subject; but rather, by mentioning the improvements, leave the imagination free to reflect what it must have been before.

We have, amongst other improvements :—The Embankments (Victoria and Albert); Northumberland Avenue; Hyde

Park Corner; new widened thoroughfares around Belgravia, on the Duke of Westminster's estate; Victoria Street; Queen Victoria Street, and widening of the Poultry; Commercial Street and Great Eastern Street; the streets through the rookeries of Seven Dials; the railway extensions and monster hotels; the new clubs; new Natural History Museum; the new theatres; the Imperial Institute; the new shops and stores, the improved residences, and other buildings, all these have entirely transformed London, and the result is that London, which formerly was as I might have described, but have left to your memories, is now preferred by very many to Paris as a residence—a sure proof that architecture has civic value. For the moment put aside the metallic element, and let us see what other civic value the citizen gains :—1. The enjoyment of the beautiful. 2. The use of the widened and ennobled thoroughfares. 3. Imperceptibly the spirits are lighter and life brighter where the surroundings are improved. It is curious, by-the-by, that the first visit of royalty to a foreign state was not alone to see the greatest king who, we are told, has ever lived, for if you refer to that book you know so well, it says the Queen of Sheba went to see King Solomon and the house that he had built. The house divides with the king the object of that visit. 4. The citizen has his delight in showing his town to visitors from afar, and also has the pleasure of proper pride in so doing, and the profit from increased custom. That my opinion is not unsupported, I quote Sir Samuel Fergusson as to the value of architecture. "Architecture is delightful in itself, and valuable to society," and he properly adds, "in proportion to its power of exalting the soul and refining the intellect."

To convince you that it rests much with you, let me remind you of the words of a good authority :—"If we are still to have great poets, great painters, great sculptors, great architects, and great musicians, the people must have aspirations as noble, a taste as refined, as those of the ages in which these arts flourished." To show you that this is not a solitary opinion, I quote what my friend, Mr. Alfred Gilbert, R.A., has said :—"The stumbling-block to the English was the practical; everything that did not present the idea of immediate advantage seemed to be impractical. Till the love of beauty was once more alive among them, there could be little hope for art." Why do I press on this necessity of self-education? Because we can never hope to have London made beautiful without it. How can we expect taste or beauty to be considered by the "powers that be" until there is an earnest desire for it by the people? In fact, I doubt if they are not right to neglect it. They are your representatives, and really they do represent you in your present mood.

Will one quotation from Ouida, that clever writer, stimulate you? It is :—"When the beauty and wealth of a great society are displayed in its architecture, in its gardens, in its public pageantries and festivals, then the body of the public is a sharer in and gainer by them." We must now claim rights of beauty.

Let me illustrate this. Formerly a man claimed—and his claim was admitted—to do what he liked, with his land. Gradually it was found so intolerable to the general community that laws were passed restraining him from doing anything thereon that could be a nuisance. The most modern probably of such restrictions is as to line of frontage, that he shall not in building come in front of other houses. Now we want to go a little further, I fancy, and say when in building you are depriving us of light and air, and oftentimes of trees and landscape, we, the passers-by and neighbours, are entitled to demand (while we agree you are entitled to so injure us) that you shall not also injure our eyes by building an ugly building, because it is unnecessary injury. We are entitled at least to have a pleasing building.

It rests with the people whether or not there shall be civic improvement. In proof I quote from the *Scottish Art Review* :—"What vast sums have been expended on public buildings without an adequate result. All this is owing to the indifference of the public."

The public has first to be imbued with a love of architecture to recognise its responsibilities. You may wish to know what ancient nation best affords you a model, not to copy, but to suggest. I answer, the Roman. The municipal architecture of the Romans consisted of the basilicas, the theatres, the baths; the Roman temples had neither the size nor the grandeur of other public buildings. The people cared most for government and justice. As one example of the size of their public halls of justice I take Trajan's Basilica, 100 feet wide, 360 feet long. Take another public building, the Flavian Amphitheatre, generally known as the Coliseum, commenced by Vespasian, completed by Titus, his son—627 feet long, 520 feet wide, 166 feet height of outer walls; $5\frac{1}{4}$ acres of land; which seated 50,000 spectators.

Next in splendour come the Roman baths (or *thermæ*). I will not trouble you with the names of the many erected; one, the Bath of Caracalla, a square of 1,150 feet each way, contained lecture-room, gymnasia, &c. Yet reflect, while ancient Rome could have such grand municipal buildings, the City of

London—the richest, the greatest city—has not one bath. I proposed a resolution at the recent wardmote and it was unanimously passed that the City should be asked to build proper swimming and other baths, and I trust we may hereafter have them. Other Roman civic adornments were triumphal arches, tombs and memorials, bridges, aqueducts, palaces; that of the Cæsars on the Palatine Hill at Rome covered about $5\frac{1}{4}$ acres, 1,500 feet by 1,300 feet. The money spent must have been enormous.

Surely if Rome could have such grand buildings we may also. It is not only, however, buildings we need; I would ask you to attend to the thoroughfares, to open spaces, to covered spaces, and, had I time, I should like to point out how much improvement to the health and comfort of this city might be effected in respect of the courts and alleys without great expenditure—in fact by an expenditure that would be profitable to the County Council—but I must reserve this for some other opportunity.

May I point out to you before passing to the last part of the subject that, whilst doing your duty to the community in educating yourselves to be able to take your place in its councils, you are by studying art and architecture adding to your own power of enjoyment? 1. In your holidays you will have an additional source of delight. 2. The delight is constant—unlike science—because the principles are eternal. Once learnt, learnt for all time. 3. You can always have the pleasure, and without payment, of enjoying the exteriors of the buildings.

We come to the last part of my subject, the commercial value, certainly the lowest ground on which I can advocate architecture, and yet I fear it is the one most likely to command attention in this age, which is always asking, Will it pay? Let me endeavour to prove this by a very old example. Belgravia was formerly called the Five Fields; the land was thought of little value, lying so low and so near the river as to be thought marshy. Well, how did Cubitt deal with it? By building small houses, as many would have done, considering such houses best adapted to so unpromising a site? No, he adopted quite a different treatment of the place. By putting thereon palatial residences—I am speaking of what was considered palatial at that time—and thus made land of comparatively little value of great value.

Let me give you more recent instances—Hankey's residences, ugly though they be—and another still more recent illustration, Westminster Town Hall and the residence-flats near it, which were built in almost the lowest slum of London. By the expenditure of large sums of money in architectural work the ground value of the land has been raised enormously.

I have so much exceeded my time I fear to multiply instances, or I could, by referring to many towns in England, show how intense has been the increase of value in land by erecting on it architectural buildings which, to the unthinking, may have appeared a waste of money. In reality, such outlay has been the most profitable outlay possible.

I would only detain you further a few moments, while I touch upon the commercial aspect as it affects tradesmen. Often have I heard them say the outlay in rebuilding or improving architecturally has been most profitable, and I feel confident the tradesman who so spends money—of course, I assume judiciously—has not only the advantage of passing the necessarily larger part of his existence in pleasanter premises, but has increased trade. I remember one client said, "I don't mind what you spend"—he is rapidly acquiring a fortune.

It is a charming thought that one of the nation of shopkeepers (as we have been called) can beautify his native town with profit to himself, with pleasure (for to be the occupier of an architectural building must give it), and with the serene delight that he is increasing the attractiveness of his city or town.

Let me sum up briefly. I have tried (1) to explain what is and what is not architecture; (2) to explain that architecture has civic value enduring through all time; (3) that commercially architecture will pay. I trust that I have succeeded. May I, in conclusion, impress on you the value of architecture itself. I quote from Longfellow:—

Ah! to build, to build,
That is the noblest art of all the arts;
Painting and sculpture are but images,
Are merely shadows cast by outward things
On stone or canvas, having in themselves
No separate existence. Architecture
Existing in itself, and not in seeming
A something it is not, surpassing them
As substance shadow.

The Students of the Battersea Polytechnic Institute and the Bromley (Kent) Plumbing Class will visit the Highgate Museum of Sanitary Appliances, under the direction of Mr. S. C. G. Fairchild, to-morrow, Saturday, the 14th inst., at 4 P.M.

THE ASSESSOR IN AMERICA.*

THERE is no subject which more properly comes before an association of architects than that of competitions. When we are engaged each for our own clients, we are not much concerned about the manner in which other offices are run. We may derive mutual help from association with each other, but the work of each architect is built in plain sight, and we can all see what he is about without asking his leave, and the professional journals give more in the way of practical information than we are likely to imbibe at a meeting such as this. When, however, it comes to butting our heads together for the amusement of the building public, it becomes a fair question whether the illusive prospects of a prize fully repay us for our sore heads.

If we must engage in contests of strength, it is important to have some rules for the game to secure fair play, and it is most essential that the referee be competent and impartial. We usually engage in these architectural combats for the gratification of a committee who form the audience, and the prize is awarded by a vote of the spectators.

It has been the opinion of learned conventions of our profession that the average committee is not competent to decide contests of so technical a nature; and, therefore, we have made a vigorous effort to secure the decision of architectural competitions by "experts." It ought, therefore, to be a matter of interest to examine into the workings of an expert decision in the case of a competition in which a number of members of this Association engaged.

The city of Milwaukee proposed to erect a building to accommodate the public library and the public museum. This building was to occupy a prominent location, and cost half a million dollars. Architects were invited to present competition sketches in accordance with a programme in many ways attractive. The drawings were all to be a uniform scale, and perspectives in outline only. The programme was carefully prepared. The successful architect was guaranteed 5 per cent., and in addition four prizes of 500 dols. each were offered for the designs next in merit. This invitation attracted 74 designs, and the first item of interest is to note where the designs came from. There were 14 from Milwaukee; 17 from Chicago and vicinity; 5 from Michigan and Ohio; 21 from the eastern States, ranging from Boston to Baltimore and Washington; 2 from the South; 6 from St. Louis and Kansas City; 7 from Minnesota; 1 from Colorado; and 1 from Canada. There were 26 from east of Milwaukee and Chicago, and 15 from west of these places. It is interesting to note next that these designs must have cost on an average 500 dols. apiece (many cost more than twice that sum), or a total of 37,000 dols. for sketches, while the total amount to be paid for architectural services, including prizes, is only 27,000 dols.

These designs, after they were received, were displayed for some days to the public. Many of the competing architects visited Milwaukee to see how their designs compared with their competitors. This led to friendly meetings among the competitors, who examined each other's designs and commented upon their excellences. Each architect was naturally anxious to determine who were his most formidable rivals, and therefore scrutinised the various plans with this object in view. There was a general agreement among those who saw the plans, both architects and others, that the designs might be divided into three groups. First, a few designs in which the problem had been solved in a fairly satisfactory manner, any one of which if built would give both the library and the museum the accommodation desired, and be at the same time a creditable architectural monument adapted to its situation. In the second class were a few more designs, evidently by competent architects, but which did not solve the problem. The exterior might have handsome features, but it did not fit the location. The plans might show some fine rooms, but they were not arranged as called for in the programme, and would not answer the purpose of the library and museum. Then came the third class, much the largest, of designs which, from a wild exterior or a still more untamed arrangement of plan, were so wide of the mark as to be unworthy of serious consideration.

When a number of architects work on the same problem, it is to be expected that, other things being equal, those who give the most study to the problem and have the best opportunities for getting information will produce the best designs. Those who are in the neighbourhood, naturally feel the greatest interest, and are likely to give the subject the most attention; they also have the best opportunities for understanding the problem in all its bearings. For those reasons Chicago architects feared principally the competition of Milwaukee, and the Milwaukee architects feared most their Chicago competitors. When the plans were made public it was the general opinion that there were at least two plans by Milwaukee architects that would rank among the first five. These were by H. C. Koch & Co.

* A paper read by Mr. N. S. Patton before the Illinois Chapter the American Institute of Architects.

and Ferry & Clas. These firms had undoubtedly had the problem under consideration for a longer time than their more distant rivals. In contrast with these it appeared that, apparently without exception, every plan from a more distant point than Chicago had some serious defect arising from a careless or insufficient study of the programme, which should be sufficient to disqualify it for the highest rank.

After the public exhibition of the plans, the next move of the library and museum trustees was to engage the services of Professor William R. Ware, of the School of Architecture of Columbia College, New York, as an expert to select the prize designs. As far as we know this was acceptable to the competitors. Professor Ware spent somewhat less than four days in Milwaukee in examining the plans, and then returned to New York, from which place he sent the report. When the names of the prize-winners were announced, there was with all who had examined the plans surprise amounting to amazement. The two Milwaukee designs were safe, but those who had been counted their strongest rivals were nowhere. Every one awaited with great interest the publication of the expert's report to know on what principle of selection the choice could have been made. This report from a professor of architecture, laying down the correct principles of design, should be of great value to the young men of the profession, many of whom tried their luck in this contest. It is this report that I propose to consider in the hope of extracting some suggestions for the aspirants to honour in future competitions. The report begins:—

I have examined the seventy-four designs submitted in competition for the Milwaukee Public Library and Museum, and have carefully studied those among them, about twenty-five in number, which seemed to be of promise. Of these the five numbered 17, 50, 51, 53 and 74 seem to be, on the whole, the most acceptable, though none of these offer as they stand a perfectly satisfactory solution of the problem. Any of them, however, would, if subjected to certain obvious modifications, perfectly well answer the needs of the city and provide a handsome and convenient building.

The necessity of thus changing the designs, in order to adapt them to the requirements of the case, arises in the main not from lack of skill and judgment on the part of competitors, so much as from their having mistaken the meaning of some portions of the paper of instructions, as in the case of the museum, or attached undue importance to the requirements which it now proves to have been impossible strictly to follow without sacrificing other things more important, as in the case of the lecture-room. This does not affect the merit of a design as a solution of the problem presented, though it may make it unsuitable without alteration. This is especially the case in regard to the museum, which some of the competitors have supposed to be intended for pictures and statuary, and for miscellaneous works of art, when in fact it is in the main a museum of natural history.

Suggestion first. It is no detriment to a competitor if he misunderstands the programme. If an architect is called upon to plan a museum and he submits designs for an art gallery instead, he is perfectly excusable. He may not know the difference. The report continues:—

The scheme best suited to such a museum seems to be a series of large rooms, occupying one over the other the whole of the wing assigned for this purpose, with no entrance from the side street. But as this was not especially stated in the instructions, and as it was impossible for the competitors to have known this, especially for those living at a distance, it would be unjust to reject the designs that embody a different idea, simply because it happens to be a mistaken one.

If it was impossible for the competitors to have known this, or to learn it in four weeks, how did the Professor find it out in four days? It would appear from this and other statements in the expert's report, that he has never read the "instructions" to which he refers, for these describe the rooms for the museum as follows. After mentioning various special rooms it says:—"The remainder of the first storey should be arranged for exhibition purposes. Second storey: This storey shall contain one large hall. Third storey: This storey shall be the same as the second, and contain a gallery." There is no side entrance called for, although every premiated design has this undesirable feature. Thus the printed instructions call for just what the Professor says "it was impossible for the competitors to have known." Notice that those "living at a distance" must be cared for tenderly. Before engaging in a competition it would be wise to move to a distance; your mistakes will then be overlooked. The report continues:—

Moreover, it would not only be unjust to the competitors, it would be contrary to the interests of the city, which it is the first duty of the committee to protect. To deprive the city of a design in other respects admirable because in certain particulars, which can easily be altered, it requires alteration, would be contrary to public policy.

This is worth knowing; the first duty of a committee on a competition is not to give an unbiased decision between the competitors, but is to protect the interests of the city. Granted, but the expert was employed to select the designs that best fulfilled the demands of the instructions. Why did he not address himself to this task and leave the protection of the interests of the city to the committee?

Now, this particular alteration can easily be made in the plans which are herewith presented that do not already show this arrange-

ment. This being so, the question, Which design best accommodates the museum? ceases to be an important consideration in choosing among them. All can be made to furnish just the accommodation that is most preferred.

With what a masterly stroke of logic does our expert prove that with a museum the interior arrangement is of no consequence in judging between plans. The writer knows of at least one competition for a museum in which the architects thought it necessary to spend much study on the arrangement of the interior, and even visited distant cities to learn the best museum arrangement. The plan adopted was largely on account of its superior adaptation to museum uses, but then the committee were not "experts."

What has been said of the museum applies, though with less exactness, to the library. The trustees of the library know just what they want, but it was impossible for the competitors to know it with exactness. They had to work, for the most part, very much in the dark.

How did the Professor find out that "the trustees of the library know just what they want"? It is a rare thing for trustees to know what they want, but in this case they did know and told the competitors very plainly in the printed instructions what they wanted. Some trustees have learned that it is one thing to know what they want, and another thing to get it when an architect stands between them and this desirable object.

The Professor says the architects had to work for the most part in the dark. No one had to work in the dark unless he was too lazy to turn on the light. The instructions were unusually explicit. We are calmly informed that "some have shown great skill, but have avoided just what is, in fact, the desirable thing." In what does skill consist if not in doing the desirable thing? But the Professor adds "insult to injury" by remarking, "Others have by hit or by wit done almost exactly what was wanted," the insinuation being evident that it was probably not by wit. The plain meaning of the above extracts is that in the mind of the expert the arrangement of a good plan is a matter of accident, and he proposes to award the prizes, not in accordance with the results before him, but on his estimate of the skill of the designers, as shown by their avoiding what is desirable. It would seem that the man of great ability who is too lazy to read the programme with care should suffer if he miss the mark; while the one, whoever he may be, who by "hit or wit," or more likely by skill, experience and hard work, does "almost exactly what is wanted," should have the prize. Indeed, the Professor has some twinges of conscience on this point, for he adds by way of apology:—

It is right that these again should have a distinct preference, and should not be set aside except for some paramount excellence, which other designs exhibit and they do not. This claim for consideration is stronger in the case of a good library plan than in the case of a good museum plan, the library problem being a more complicated and difficult one, and the prospect of satisfactorily altering an unsatisfactory scheme being much less promising.

Next in the report is a reference to the lecture-hall, which made trouble for nearly all the designers because it was stipulated to be on the first floor where it interfered with other more important rooms. The Professor's remarks on this point are eminently fair toward all the competitors. The report then turns to the question of the design:—

But the most important element in a design is its architectural character, and this element is not susceptible of such manipulation. In this respect the different designs must be judged as they stand. The architectural treatment without and within is not open to such modification as substitution. It is something individual and personal to the design and its author. The taste, skill, knowledge and judgment evinced by any one of these competitors cannot be transferred to another. In choosing among the designs submitted, this is, accordingly, a consideration of paramount importance. The object of a competition, indeed, is not only to secure a convenient and suitable building, but to secure evidence of the taste and skill of its designer. The exhibition of taste and skill, and of professional capacity and resource is, accordingly, a main consideration in choosing among the designs submitted. This cannot, of course, be transferred from one set of drawings to another. In a building like this, which is eminently a public monument, this consideration is of exceptional importance. This does not mean that there is no substantial ground of choice between these designs. It means that artistic considerations should, in such a building, have a certain precedence, since matters of practical convenience can always be secured with sufficient care and pains, while all the care and pains in the world will not change personal and professional qualities.

Here are several novel propositions which rest on no more substantial foundation than the mere statement of their author. In the first place, is the assertion that while the plan of a building can be radically modified, no such changes can be made in the design, a statement that is disproved by the experience of every architect, for is it not a common practice to prepare a plan and submit two or more designs of widely varying character for the exterior? Professor Ware is evidently of

the opinion that it is a more difficult task to make a good exterior than a good plan. The falsity of this opinion is proved by this very competition, in which there were without question fewer good plans than good designs. The student of architecture learns the elements of design first; he only learns how to make a practical plan after years of experience. If the statement that "the taste, skill, knowledge and judgment evinced by any of these competitors cannot be transferred to another" holds true in the matter of the design, as the Professor informs us, much less can they be transferred in the matters pertaining to good planning.

Suggestions for exterior design are much more accessible to architects than are interior arrangements. As will be illustrated later, it is often possible to draw inspiration for a façade from some European structure, but more difficult to find any plan that will fit the new conditions. The genius for good planning is as rare as that for good designing, but what is still more rare is the ability to unite a good plan and a good design, so that the design shall express the plan. This element of design, that it shall be a grammatical expression of the main features of the plan, is entirely overlooked by the Professor, probably because the designs selected by him are so lacking in this respect. They are masks that hide instead of expressing what is behind them.

The first plan mentioned, by Nettleton & Kahn, has end pavilions, but no centre pavilion, which might indicate the double nature of the building—library and museum, but an examination of the plan reveals the fact that there are no walls separating the pavilions from the central portion, the reference reading-room being half in the pavilion and half out of it. Thus the divisions of the façade do not express the arrangement of the interior. The Professor remarks about this plan:—

As to the library, while the arrangement of the delivery-room and the book-stack could remain substantially as shown, the position of the reference-room and service rooms would probably have to be reversed. It would hardly be worth while to contemplate so much alteration if it were not for the admirable character of this design, both within and without.

The "so much alteration" means nothing less than a new plan for one-half the building. The location of the reference-room in relation to the book-stack was one of the most important, and at the same time most difficult, problems of the design. A failure in this respect is radical, and is not one of the minor points that can be overlooked. The report criticises the narrow main entrance, but overlooks the still narrower communication with the book-stacks, which is entirely inadequate.

The next two designs, by H. C. Koch & Co. and Ferry & Clas, were by general consent placed among the best, and it was no surprise when they were so placed by the expert. The faults of planning are not radical, but the character of the elevation of the Ferry & Clas design is a curious commentary on the Professor's remarks about the architectural treatment being something individual and personal to the designer. He says:—"The elevation is to my mind one of the best, if not the very best, of them all—elegant and sufficiently dignified, and a great improvement upon the library at Leipzig, which it notably resembles. The central feature is much more to be commended." This small cut of the Leipzig library is sufficient to show that the Ferry & Clas design is almost a facsimile of it, the only essential modification being the addition of a dome to the centre. A comparison with the agricultural building of the World's Fair shows where design for this dome was found. This free-and-easy manner of obtaining designs is, according to Professor Ware, something individual and personal. Other members of the profession may well congratulate themselves that such architectural kleptomania is not a contagious disease; and, therefore, they need not fear that they will wake up some morning and discover that they have unconsciously assimilated another man's design by swallowing it whole. Undoubtedly Professor Ware will claim that such a combination of two designs with the modifications made is allowable in architectural practice, and is a proper method of producing a design. If we grant this argument, what ground is left for the claim that no other architect could have adapted the design of the Leipzig library to the plan of the Milwaukee building? The plans submitted by Ferry & Clas show much greater evidence of originality and skill than the elevations, and no doubt required the expenditure of more study. This method of making a design by borrowing it ready made from another building has the unavoidable result that it does not fit the interior; this is shown in a striking manner by the second-storey plan, in which the museum is cut off from the front by two small rooms. The only rational treatment of a design in which each storey of the museum is one large hall, occupying the whole of one wing of the building, is to bring this hall to the front and recognise it as a feature of the façade. Not one of the premiated designs adopts this treatment; either the museum is not brought to the front at all or it is not indicated on the façade. One would suppose that a professor of architecture would be thrown into a nervous paroxysm by such a plan as that of the second storey

of the Ferry & Clas design, in which the museum stops at one mullion of a triple window, but he passes it without a comment. The next design, by Andrews, Jacques & Rantoul, is described as exhibiting almost more than any other the qualities of an elegant and scholarly arrangement that should characterise a building of this class. He says:—"The reference-room is ingeniously placed, one half storey above the main floor, and the newspaper-room one half storey below." This is one of the instances referred to in the report in which great skill has been shown in doing what was not wanted; but the Professor immediately apologises by saying, "but this is not essential to the design and need not be seriously considered." Thus it was meant as a joke that the reference-room was placed one-half storey higher than the main floor, when the programme explicitly states that the convenience of bringing books from the stack to this reference-room is an important consideration. When the attendants run up and down the stairs to the reference-room they will be reminded perpetually of this remarkable witticism of the architects'. The space marked "delivery-room" is in fact a public corridor, being the only means of access from the interior to the librarian's office, cataloguing-room, general reference-room and newspaper reading-room. The book-stack is so arranged that some of the cases are without direct light and there is only a single very narrow entrance; but according to Professor Ware the interior is of little consequence, and we turn our attention to the exterior of this design. To our great surprise we find the Professor remarks that "the external aspect does not quite bear out the promise of the interior; but it is simple and dignified, and if treated with the elegance of detail that the handling of the problem seems to promise will be handsome and satisfactory." That is to say, if money is lavished on the detail, our attention may be distracted from the ungainly aspect of the building as a whole. If this design with its flat-topped part placed against the end of the main building is suitable and satisfactory, then all the other designs which show a symmetrical façade extending from street to street must be mistakes.

As the Professor remarks, the interior of the reference-room is not to be taken seriously, so the exterior must be meant as a joke. The architects in their own description of the plans state that this wing is given a separate treatment for the sake of "symmetry." The last of the premiated designs is that of Boring & Tilton. The Professor has found very little to say in favour of this plan; and although he makes some criticisms, he has failed to notice that the book-room is too wide to be lighted in the centre.

This paper is not intended as a criticism of the premiated designs, but is a criticism of the principles laid down by Professor Ware in making up his decision. It is impossible to give a just criticism of the design when only one floor plan has been published; but this would not have troubled our expert, for only once does he even refer to the existence of more than one floor in the library portion, and then makes no comment upon it. The report is very superficial; in fact the Professor might better have announced the prize designs without any report, for he makes no comparison between them and the others. Perhaps he had in mind the anecdote of the old judge who advised the young one never to give any reason for his decision, otherwise he would certainly get himself into trouble. A proper report would at least have taken account of the twenty-five designs that he states were worthy of serious consideration, and have instituted comparisons between them to show in what particulars those selected were superior. One is forced to the conclusion that this was not done because the examination of the plans was so superficial that the expert was unable to make a comparison. The report gives throughout evidence of hasty and incomplete examination. There were several intricate and difficult problems to be solved, especially in connection with the library. The arrangement of the stack-room to give maximum floor area with the best lighting required much study on the part of the designer. No reference is made to the stack-room in the criticism of any design except that of Ferry & Clas, where it stated that the form of the book-stack "is especially ingenious"; but we are not told in what this ingenuity consists, or whether there is any benefit arising from such ingenuity. No reference is made to the lighting or to the provision for heating and ventilation, and finally the limit of cost is ignored altogether in the awarding of prizes. The expert forgot about protecting the interests of the city. The report says "the final choice of the committee must probably be determined in large part by consideration of expense." It is a valuable point to remember in future competitions in which an expert is to be employed, that although the question of expense may be considered in choosing between the prize designs, it will not count in awarding the prizes. Under these conditions most architects will work to secure a prize, and then take their chance with the committee. In this competition many architects, recognising the fact that the limit of cost was low for a building of such a size, conscientiously made their designs simple in character, avoiding such features as domes,

The case has brought expert decisions in architectural competitions into as ill repute as expert medical testimony in insanitary cases. The courts are wiser than to decide on the evidence of any one so-called expert. The first lesson we can learn from this case is that we should not risk the decision of an important competition to the whim of any one man. It is difficult to draw further lessons unless we know whether the decision of this competition is exceptional in its character, or whether it is the best we may expect from an "expert."

In the first case we can only agree with the architect who remarked that it appeared as if the Professor had done a cheap job in Milwaukee. If the second supposition be correct, then we may well doubt the qualification of a professor of architecture to decide a competition more serious than that between students.

AMERICAN ARCHITECTS AND PUBLIC BUILDINGS.

IT was believed by American architects that the Tarsney Act, which was lately passed, would be loyally enforced by the Government, and that the designs for public buildings were henceforth to be obtained by competition. About a year ago representatives of the American Institute of Architects entered into correspondence with Mr. Secretary Carlisle on the subject, and were assured that arrangements for the purpose were in progress. In last November Mr. O'Rourke, the supervising architect, in reply to a letter, wrote:—"I have no reason to believe that there is, or has been, any reason for deferring action in this matter, beyond the fact that the Secretary's time has been so fully occupied by public business of the most pressing character that he has not been able to give the law in question the consideration necessary to putting in operation the methods therein contemplated."

It was not long before the members of the Institute discovered that it was not wise to put their trust in American statesmen. A federal building was required for Buffalo, and in spite of the guarantees, the design for it was prepared in the office of the supervising architect. As the design was not above the ordinary official attempts, the directors of the American Institute wrote to say they believed it to be their duty to their profession and to the whole community to protest, "for any structure of the general character of the design, if carried into execution, will be found absolutely wanting in the fundamental elements which go to make a public building, and will be condemned by the community. We therefore respectfully urge that you use your power to prevent the construction of this design." The supervising architect in reply said:—"This communication is of such an unusual and extraordinary character, based on *ex parte* and indefinite information, and so at variance with professional courtesy and good breeding, that, in justice to the A.I.A., I hesitate to believe in its legitimacy, and request that you will kindly advise me by return mail if it has really emanated from the board of directors of the A.I.A."

On February 5 the executive committee of the Institute endeavoured to have an interview with the Secretary. Mr. Carlisle would not meet them, but referred them to Mr. O'Rourke, with whom the committee refused to have any communication until he had withdrawn his letter, which reflected on every member of the committee. The Assistant Secretary for State, however, gave the committee to understand that the plans for the Buffalo building had been withdrawn, and that the work would rest where it was.

On February 6, Mr. O'Rourke wrote to Mr. Burnham, president of the Institute, and said:—"I shall be much pleased to meet you or the executive committee of the American Institute of Architects at any convenient time, for conference and mutual exchange of views on this subject."

In reply Mr. Burnham said:—"I regret exceedingly that the conference which you propose between yourself and the officers of the American Institute of Architects is impossible. It can only be made so by the preliminary withdrawal on your part of the official letter dated January 17, signed by yourself, as 'F.A.I.A.' and as 'Supervising Architect,' and addressed to Mr. Alfred Stone as 'Secretary A.I.A.,' in which you refer to the document signed by the directors of the American Institute of Architects as 'at variance with professional courtesy, good breeding,' &c."

"I sincerely hope you will withdraw the letter I refer to, and also the copies sent to members of the directorate. I am sure you will gain the esteem of all men of the profession by taking this course."

The next step taken was to appeal once more to the Secretary. Mr. Burnham in his letter said:—

"I now have the honour of taking up the points brought out in the interview with the Honourable Assistant Secretary in Washington on February 5. The gentlemen of the committee of the Institute who were present on that occasion were George B. Post, E. H. Kendall and Charles F. McKim, of New York; Arthur Rotch, of Boston, and William W. Clay and Samuel A. Treat, of Chicago. Each of them would be regarded

as a competent critic of architecture, and there can be no doubt as to their fairness.

"The design of the Buffalo building, which is so often referred to in the above papers, was examined by them with a view of suggesting changes to bring it up to the proper standard for a structure of that nature. Their unanimous conclusion was that such a course was not possible; that to make the present design satisfactory would involve changes so extensive as really to produce a new design.

"The question the people of Buffalo now ask is not 'Can the Act of '93 be improved?' They know that as it stands you have the power to order a competition for their building. They have the opinion of the board of directors of the Institute that the design made in Washington is improper, and they believe this themselves. They ask you to take the step which the law authorises, thus insuring a noble monument which may be for ever a pleasure and pride to the city. This competition can be carried through in an exceedingly short time if you will order it. The exigency of the case would be considered by the architects, and they would be willing to prepare much quicker than could ordinarily be expected of them.

"I have already said that the architects themselves will agree to furnish a full and satisfactory competition for this special case without cost to the Government. We are also ready to assist the Government in the arrangement of a code for the competition.

"I note by the public press that the supervising architect recently informed Assistant Secretary Curtis that it will take three years and a half for his office as now constituted to design the buildings already authorised. If this be approximately true, the retaining of a number of the most able architects of the country to assist him is imperative and urgent.

"I now have the honour to request you to name a day when the executive committee of the Institute may be heard by you on the questions covered by this memorial. We offer to assist in placing its architecture upon the footing demanded by the country. We will serve without pay, giving our best endeavours to the work."

In spite of the economical attractions of the President's offer, Mr. Secretary Carlisle was not to be tempted. In acknowledging the receipt of the memorial, he informed Mr. Burnham:—"It has, therefore, been determined to proceed with the work in accordance with the design prepared by the supervising architect, which is satisfactory to the department, and which it is believed will, when carried into execution, meet the approval of the public."

Another protest was at once sent by the President of the American Institute. In the course of it he said:—"The working of the supervising architect's office is not a free-masonry requiring special trained adepts to undertake it. It is a simple organisation which any good business man, with a knowledge of building, can understand or operate, and I venture to assert that if the goodwill to do so were present in your department, the organisation of the office on the basis of the present law, which gives you the right to employ the best designers in the country, could be brought about in a few weeks, and that it would then be better than the present one.

"I do not forget the protestations of the supervising architect of his readiness and anxiety to do all in his power to forward this important matter. I am aware that you yourself stated to the gentlemen of the Institute that you were in hearty accord with them on the subject. I am also aware that twelve long months have since passed, during which nothing whatever has been done in your department looking toward the carrying out of this law, except at the eleventh hour, when Mr. Secretary Curtis stated to a committee the four principal obstacles which were in the way.

"The obstacles are not real ones and never were, and after carefully looking over the ground I can see no others, although I am tolerably familiar with the workings of the supervising architect's office in Washington, and entirely familiar with the law on the subject.

"You now inform us, in effect, that the law must be amended before you will act under it. I can see but one amendment which is needed to insure the satisfactory working of this measure, *i.e.* the introduction of a clause ordering the Secretary of the Treasury to carry out its plain intent and purpose and not leaving it to his discretion."

The last words nettled the Secretary, and on March 12 the correspondence comes to a close with the following curt epistle from Mr. Carlisle:—"Your very offensive and ungentlemanly letter of the 9th inst. is just received, and you are informed that this department will have no further correspondence with you upon the subject to which it relates, or any other subject."

Nobody would be surprised if the officials of an English department amused themselves with playing with any of the architectural societies, but it was supposed that the American Institute of Architects was possessed of some influence which would insure respect in a Government office. It is now evident that architects in the United States are, in the eyes of officials, as unimportant as their brethren in England or France.

The members of the American Institute have been under a delusion about their position, for not one of the workmen's societies in the United States would have been subjected to so much humiliation over a question of employment. The rejection of the services of architects, although offered gratuitously, cannot be advantageous for the profession among men of business. It is holding out a flag of distress, and hard terms are sure to be demanded.

NORWICH CASTLE.

IT is uncertain, says the *Eastern Daily Press*, when the Castle Museum will be opened to the public, but when that event takes place the citizens will find that a remarkable transformation has been effected. Though the castle has undergone many curious vicissitudes in its progress towards a museum, it has known no more striking change than that which the last few years have witnessed. From being a prison house, it becomes from henceforth one of the most delightful resorts for the studious and the curious that the provinces can boast. It was never a fitting thing that the most commanding site in the city and the most interesting of our ancient remains should have been associated with the punishment of crime. It was a narrow piece of State economy to turn the unsentimental bricklayer loose among the Norman arches of a feudal stronghold in the endeavour to make it answer the requirements of the penal code. Compared with only a few years ago, the present order of things suggests a delightful contrast.

To rescue the structure from its baser uses and apply it to the purposes of a county museum was a vigorous idea; indeed, at the outset it bore an aspect of extravagance and impracticability. It was not surprising, therefore, that the public mind did not embrace the proposal all at once. The late Mr. J. Gurney, apart from whose generosity and encouragement the museum scheme would never have been floated at all, at first utterly disbelieved that the old county prison could ever be made to serve the purposes to which Mr. Boardman proposed to apply it. The prison governor, Mr. Dent, likewise entered a vigorous demurrer. The architect, however, was able to demonstrate the feasibility of his plans, and thenceforth the notion seized upon the public sympathies. It is needless to record how Mrs. Gurney, with generous loyalty to the wishes of her deceased husband, came down with 5,000*l.* out of her private fortune, and how others followed in her train. To record all the changes which the architect has devised would be to turn this notice into an architectural catalogue, and even then the public mind would not be enlightened, for the general plan of the castle, perhaps, is not clearly understood. To be plain and brief, the whole enclosure is, roughly speaking, circular; the keep, which abuts on the outer circumference, occupying about one-third of the entire area. Within the battlemented walls, but separated from them by a footway some dozen feet wide, there is a range of six plainly-built rooms connected with each other by Tudor corridors. These rooms could not have answered the museum scheme much better if they had been designed with that object expressly in view. The cells with which they were filled have been swept away, and now the walls are lined with smart new air-tight cases almost ready to receive the museum collection.

To the average visitor the keep, of course, will be the principal seat of attraction. The interior now forms a fine, spacious hall, with a glazed roof. Round the best-preserved parts of the old unrestored masonry runs a substantial wooden gallery. We need not speculate here on the uses to which this handsome chamber may come to be put, but there is no doubt that its associations and other advantages will speedily bring it into demand. The removal of the clumsy brickwork with which the ancient masonry of the interior was disguised has been carried out with the most successful results. So precious are the architectural treasures brought to light that some of our local antiquaries have become morbidly fearful lest the wall should suffer from the process of decay. It has therefore been proposed that the whole of the stonework of Norman origin should be indurated with some protective preparation. Mr. Boardman, however, has decided to recommend no such process at present. He has paid a special visit of inquiry to the Tower of London, but it seems that induration is not adopted there, nor is it regarded as at all necessary. The excavation of the dungeons beneath the keep has brought to light little or nothing of archæological interest, if we leave out of account the crude reliefs on the walls. In one instance there is a well-defined cross with a roughly-drawn human figure upon it. In the opinion of those who are learned in such things, this humble expression of Mediæval devotionism may well date back to the time of King Stephen. Across the gulf of seven or eight centuries the tender faith of a prisoner in a feudal dungeon shines star-like upon us.

When we pass by an abrupt transition from the subject of feudal keeps and dungeons to the electric light and the Blackman fan we almost feel ourselves guilty of some ludicrous

anachronism. And yet we shall only be recording what has actually taken place. It is really true that the whole of the interior has been illuminated by the electric light, and it is equally true that the air within the walls will be renewed by means of that marvellous contrivance, the Blackman ventilating and heating fan. Notwithstanding the halo of romance which poets and novelists have thrown about the times of Hugh Bigod, the suburban jerry-builder of the nineteenth century could give him some useful tips on the score of health and comfort. There are two sets of lavatories at the castle such as King Stephen in his wildest dreams of magnificence could not have foreseen. These time-worn fanes and fortresses are sweetest when modern science and resource have civilised them somewhat. The barbaric splendour of the past is never so splendid as when viewed through the medium of the unenlightened imagination.

SOCIETY OF SCOTTISH ARTISTS.

THE annual general meeting of the Society of Scottish Artists was held in Edinburgh on the 6th inst. Mr. Robert Noble, A.R.S.A., who presided, in proposing the adoption of the annual report, expressed regret that the year had been an extended one, but added that that was through no fault of the Council. It was his duty to apologise and explain that it was all owing to the change of the date in obtaining the National Gallery rooms in which to hold their exhibitions. They were at present in communication with the Board of Manufactures for the grant of the rooms to hold their third exhibition, and as the Board had expressed a desire that it should be held in the summer season, they had made application for the months of September and October. Failing these months, he could only recommend the summer of 1895 for their next exhibition. However, to go back again on the report for the past year, he could not but consider it a highly satisfactory statement, and he was sure they would confirm that opinion. Again they showed a surplus, which, added to their previous year, made 454*l.* And when they considered the unparalleled depression they were passing through, which affected art as well as trade, and taking into account the unfavourable change of date for holding their exhibition, they had still a sure guarantee that, on the lines laid down for guidance, the Society of Scottish Artists could finance successfully an exhibition at either date. The depression affected the sale of pictures, and their revenue on that account was considerably less. They had every reason to be proud of the artistic standard attained in their past exhibitions; they should therefore see that the next was not a bit behind. There was no doubt that much depended on the taste and tone of an exhibition in making it a success; and as they had hitherto made that a special feature, and might claim originality on that score, no matter what might be said to the contrary, let their taste, therefore, always be artistic. In their loan collection they made no effort to change the schools represented from that of the previous year, and gave great satisfaction to members as well as the public. Nothing, for instance, could be more varied in style and treatment than the examples of the Barbizon school in comparison with that of the more modern Frenchman "Aman Jean"; or, coming nearer home, to the different treatment of Sir John Millais, the late Mr. Pettie, and many others of their own school. He trusted that in the years to come the exhibiting of those masters would have a healthy influence on the younger men of the Scottish school of painters. Whilst thanking those lenders of pictures, he could assure them that those gentlemen were only too pleased to assist the Council, the more so after being told of the aims of the Society. He expressed the hope that a still greater effort should be made by their professional members to fulfil the second aim of the Society. Already they had done well, but year after year there must be an advance in their efforts; the public as well as lay members would look for it. The report was adopted. The following officers were elected:—President, the Marquis of Huntly; vice-presidents, the Lord Justice-General, Sir James D. Linton, P.R.I., Sir John E. Millais, R.A., and Mr. W. Q. Orchardson, R.A.; chairman of council, Mr. R. B. Nisbet, A.R.S.A.; vice-chairman, Mr. Duddingstone; secretary, Mr. R. H. Christie.

OLD AND NEW EDINBURGH.

A PAPER was read at last week's meeting of the Edinburgh Architectural Association on "The First Wall of Edinburgh, or the King's Wall, and some evidence relating thereto," which was written by Dr. Millar, F.S.A. He said that Maitland asserted the King's wall was built after 1450, but from a charter of James II. it appeared that this wall formed the boundary of houses on the south side of the High Street at an earlier date. The line of the wall, as shown with the aid of a limelight view, passed in almost a direct line from the Castle

to the Netherbow, its course being through the centre of the block of houses on the south side of the High Street. Portions of the wall were discovered early this century at Parliament Square. This wall existed from the earliest period in the history of the town.

Mr. G. S. Aitken, architect, read a paper on "Modern Edinburgh," discussing the precise point at which James Craig, the pioneer in the planning of the New Town, commenced his work. The lecturer said the fact usually stated was that the first house erected was in Rose Court, George Street, by John Young, and that it secured to him the premium of 20*l.* offered by the magistrates to whoever should build first, the foundation-stone being laid by Craig, October 26, 1767. Mackay, in his "Barony of Broughton," mentioned Thistle Court, and gave the date as 1766. In an early map without date, published by Ainslie, which he stated was a copy of one in the possession of George Paton, of the Customs, and dedicated to Lord Provost Steuart, thus fixing it at the years 1780-81, the only houses shown immediately behind St. Andrew's Church are the *vis-à-vis* two-storey blocks still standing in Thistle Street, with gardens or forecourts separating them, and numbered 1, 2, 3 and 4. In early days No. 2 was the abode of Sir John Gordon, and No. 4 of Sir Alex. Don, of Newton Don. Another authority stated that the first house built in the New Town was No. 1 Princes Street, next the Register Office, and that it was erected by John Neale, a haberdasher, who took possession in 1774, but discouraged by want of patronage in his new quarters, returned to his original place of business in the Old Town. It was further stated that being the first house erected it was exempted from all burghal taxation. This might mean that it was the first erected in Princes Street, for it was evident that priority of date settled the question in favour of the Thistle Street house. The early houses in Princes Street, it was said, had no doors to the main thoroughfare, but were entered by common stairs from the mews' lanes. This might quite well have been the case. As Craig's plan indicated no stables at the backs of the houses, the approach from that side would therefore be unobjectionable. The first part of the New Town begun was the eastward end, but in this quarter occurred no buildings of any special interest except Sir Laurence Dundas's house (which was designed by Sir William Chambers), and the corner blocks that flanked it in the line of St. Andrew Square. Of these two blocks that to the north, it had been suggested, corresponded with a design in one of the Adam's volumes in the Soane Museum of a house for Mr. Andrew Crosbie, advocate (the original of Pleydell in "Guy Mannering"), but the fact was that the columns and mouldings did not accord with those usually employed by Robert Adam; indeed they were not good enough to be his work, and it was moreover unusual for him to use an order rising at once from the ground floor, although his father, William Adam, did so, as might be seen at Hopetoun House and Airth House. The most interesting and scholarly examples of the early phases of New Town architecture were to be found in the façades of Charlotte Square, and it would be well if, recognising this, the proprietors jealously guarded these treasures from being tampered with, or if it was necessary that alteration should be made, arrange that it be done with the utmost good taste and in a conservative spirit. There was no portion of any of the four sides which would not repay careful study; each side was arranged on the central block and wing system, and one strong point of merit was that the roofs, contrary to practice in Classic architecture at that time, were made to form a visible and agreeable part of the composition.

ARCHITECT'S FEES.

AT the Tenterden County Court, the case Ernest Hadden Parkes, architect, *v.* Charles Thomas Pizey, vicar of Smallhythe, was heard. Mr. D. C. Bartley, barrister-at-law, instructed by Mr. J. A. Collins, appeared for plaintiff, and Mr. De Mortimer-McIntosh for defendant. The action was for 26*l.* 5*s.* for professional charges by plaintiff in regard to work done for the restoration of Smallhythe Church. For the plaintiff it was stated that plaintiff had considerable experience in church restoration work and had carried out the restoration work of Wittersham Church, where in July 1892 he was met by defendant who spoke to him about proposed alterations at Smallhythe Church, and subsequently wrote asking for plaintiff to go and see him with a view to placing the matter in his hands. On August 15, 1892, he had an interview with defendant, and they went together to the church. Defendant pointed out the various proposed alterations, and instructed him to prepare plans. The question of raising the money was also discussed, and defendant stated that he hoped to get some of it by subscription from neighbours, and also wished to get grants from the Diocesan Church Building Society and the Incorporated Church Building Society. Plaintiff knew that to obtain these, plans would have to be submitted to the societies, and he discussed the subject with

defendant. For this interview plaintiff had charged 1*l.* 1*s.* On August 25, 26, 27 and 29 and other occasions plaintiff went to the church to take the necessary measurements to enable him to prepare the plans. For this he had charged at the rate of 2*l.* 2*s.* per day, making a total charge of 9*l.* 9*s.* in respect of this, although he said he had a right to charge 3*l.* 3*s.* per day, according to the scale on which architects usually based their charges. He showed defendant the sketch-plan, and was to prepare a plan to carry out the ideas indicated in the sketch-plan. In the meantime plaintiff prepared detailed plans, and he charged 5*l.* 5*s.* for preparing plans to submit to the societies. He subsequently wrote to defendant several times with a view to the work being commenced, but could not get any definite answer from him. The total cost of the restoration plaintiff estimated at 350*l.*, on which he claimed to be entitled to make a charge at the rate of 3 per cent. A claim was also made for 1*l.* 1*s.* for incidental expenses. As he could get no definite answer after waiting a long time, with a view to bringing the matter to a head he finally wrote on November 6, 1893, for payment of 10*l.* on account, received no answer, and subsequently the present action was taken. Evidence was also given to the effect that the charges were reasonable.

For the defence it was contended that the question of proposed work was a very small matter, and that what was contemplated was removing some old pews and replacing them by slips and reflooring. Several other matters were mentioned, but only by way of conversation. Defendant did not think the cost would exceed 150*l.* Defendant was greatly annoyed at the application for payment for 10*l.* on account before an account had been rendered, and it was contended that the only instructions given plaintiff were to prepare a plan for the defendant's approval, and that defendant never had approved of the plan.

His Honour, in the course of his summing up, said that it was necessary for plaintiff to make details of the measurements, that he was entitled to some remuneration for the work he had done, and he was of opinion that the sum of 9*l.* 9*s.* was a reasonable charge which should be paid. With regard to the charge of 10*l.* 10*s.* which had been based on percentage, His Honour was of opinion that this would have been far better to have been dealt with as a question of time, and for that item he allowed 6*l.* 6*s.* As to the incidental expenses he did not think he could allow them. His Honour declined to allow the charge of 5*l.* 5*s.* for preparing plans to submit to the societies, which he held to be premature, and that plaintiff should have waited for instructions before preparing them. Judgment for plaintiff for 15*l.* 15*s.* with costs. On the application of Mr. McIntosh the amount was made payable by two monthly instalments.

GENERAL.

The French Artists who exhibit in the Champ de Mars have resolved to avoid sending works to the Antwerp Exhibition, as they are not represented on the committee of organisation equally with the artists of the Champs Elysées.

The Hanging Committee of the Royal Academy for this year are Messrs. Sant, MacWhirter, Woods, Moore and Davis for painting, Mr. Alfred Gilbert for sculpture, and Mr. Waterhouse for architecture.

Sir Benjamin Baker, C.E., has reported that the cost of raising the temples at Philæ to a secure height would be 150,000*l.*

Alternative Designs are in preparation for the County Offices, Wakefield, plainer and cheaper buildings being desired by the County Council.

Members of the Surveyors' Institution have formed themselves into a committee in order to raise funds for a testimonial to Mr. Julian C. Rogers, who has filled the office of secretary during twenty-five years.

An Exhibition of hammered ironwork was opened at Ironmongers' Hall, Fenchurch Street, on Wednesday, by the Lord Mayor.

The Surveyors' Institution will meet on Monday, the 16th inst., when the adjourned discussion on the paper read by Mr. Howard Martin, at the meeting of March 5, on "The Report of the Local Government and Taxation Committee of the London County Council on the subject of the Rating of Ground Values," will be resumed.

Mr. W. E. Hill, at the meeting of the Liverpool Architectural Society on Monday, the 16th inst., will read a paper entitled "A Few Notes on Mediæval Architecture in the West of England."

Mr. Lancelot Wedderburn has presented to the Leeds Municipal Art Gallery two historical pictures, painted in 1775 by an artist named J. B. Bolab Sen.

The Architect.

THE WEEK.

As Sir FREDERICK LEIGHTON is to be the recipient of the gold medal which was originally intended to reward young students of architecture, he will probably have to pay for the gift by giving advice gratuitously. Although he does not yet possess the medal, the President of the Royal Academy has been called on for an opinion by no less distinguished a body than the scavenging committee of the Bath Town Council. It appears a destructor is about to be set up, and it had to be decided whether a chimney constructed of buff bricks or one of red bricks would be the prettier. Bath has an excellent official architect, but so important a question was considered to require the judgment of Sir FREDERICK LEIGHTON. Although at the present season an Academician has enough to occupy him with his own works, Sir FREDERICK courteously responded. He wrote:—"I have no difficulty in answering your question at once. Rich full-toned red brick grows in beauty through weather, wear, and time; paler material, commonly called white brick, increases in unwholesome dinginess with every week, particularly in the West-country climate. There can be no difficulty, therefore, in deciding which material is the more suitable for a purpose of which one cannot under all circumstances but deplore the necessity." "Much will have more," says the old proverb, and it will scarcely be credited that one of the councillors suggested that the President might paint a picture of the destructor for them without increasing the rates in any way. As the example of the Bath committee is likely to inspire other authorities to obtain opinions without paying for them, Sir FREDERICK will find it an advantage to spend the ensuing months in some distant region.

It is remarkable how many circumstances appear to arise as if for the purpose of keeping up the interest in SCOTT'S novels. This week many people are likely to be engaged in reading "Kenilworth," for the legends on which that romance was based have had their influence on a law case which came before Mr. Justice NORTH. The plaintiff, Mr. SCOTT-HALL, purchased Cumnor Place because he imagined he was gaining possession of an historic property. According to the auctioneer's description, the property consisted of a "freehold dwelling-house, &c., deriving its name from the very historical abbey once standing in Cumnor Park, of which the present property forms part, and referred to in Sir WALTER SCOTT'S novel 'Kenilworth' as the place where AMY ROBSART died." There were other rhetorical flourishes introduced which rather obscured the prosaic facts. The plaintiff was one of those numerous people who somehow imagine that at auctions they can pick up treasures. He saw the "lot," not as it was, but as it appeared in SCOTT'S pages; and, on the supposition that he was acquiring a house the legendary interest of which was enhanced by the occasional appearance of AMY ROBSART'S ghost, he bid 2,010*l.*, and was declared to be the purchaser. Judging by the value of the ordinary property in the neighbourhood the sum might be considered rather high; but, as a man acquires dignity from owning something which belonged to the great LEICESTER, it is only fair he should pay for it. Mr. SCOTT-HALL'S enthusiasm cooled down when the excitement of the auction was over, for it was not long before he discovered that the house did not correspond with SCOTT'S description, and he tried to get out of the completion of the purchase by taking an action to have the contract set aside on the ground of misrepresentation. A judge cannot be expected to save people who allow their imagination and desires to control their reason. Mr. Justice NORTH, in the first place, decided there was no misrepresentation by the auctioneer. In the second place, his lordship declined to believe that the plaintiff was led away by misrepresentation of any kind, not even Sir WALTER SCOTT'S. In the novel the house was supposed to stand on the west side of the church, while the house that was sold stands on the east side. If the plaintiff

had used "Kenilworth" as a guide, he would have found that there was no place for the machinery which caused the death of the favourite. The case failed, and the plaintiff will not have the sympathy of novel readers. Mr. SCOTT-HALL had better make the best of his bargain, and he can be happy in his old home, although it was never used as a prison or for a murder.

It was decided at the meeting of the London County Council on Tuesday to invite competitive designs for some of the dwellings to be erected on land in the Council's possession which is required to be devoted to the accommodation of the working classes. The competition is to be limited to six architects who have shown themselves to be thoroughly competent. The sum of 50*l.* is to be paid to each competitor, and, in addition, a sum of 200*l.* is to be distributed among the competitors at the discretion of the public health and housing committee. The usual commission of 5 per cent. will be paid to the successful competitor in addition to the sums mentioned.

GLASGOW is not a city which a visitor would consider as severely moral, and there are few men who have not heard tourists express their amazement at the laxity which is permitted. It is therefore pharisaic on the part of the authorities to prohibit the exhibition of photogravures which in London and elsewhere have been admired by men and women whose virtue is undoubted. To suppose that such artists as Sir FREDERICK LEIGHTON, Mr. WATTS, Mr. POYNTER, Mr. HACKER and Mr. SOLOMON, the painters of the original pictures, would pander to a depraved taste, is absurd. We doubt if the austere Bailie NICOL JARVIE or his worthy father the Deacon would make so ridiculous an exhibition of themselves as the present police authorities. If works like the *Bath of Psyche*, *Diana and Endymion*, the *Visit to Esculapius*, *Syrinx*, *Orpheus* and *The Judgment of Paris* are unfit for exhibition, what is the advantage of expending money on art galleries in Glasgow?

THE exhibition of wall-papers and other products for wall decoration at Messrs. JEFFREY'S factory at Islington is most interesting. It is not often such excellent design is combined with perfect manufacture. By commissioning the ablest artists in decoration and employing the most enduring materials, Messrs. JEFFREY have gained success that some years ago would have appeared to be unattainable in England. They have been no less fortunate in extending their operations. From embossed paper they have gone on to embossed leather and copper. Their *portières* in leather will more than sustain a comparison with old Venetian work, and, judging from the appearance of early samples, it is evident that time increases the beauty of them. The panels in *repoussé* copper are surprising not only from their delicacy, but on account of their moderate price. Neither France nor Germany can show better adaptations of the two classes of work, and they merit to be extensively employed. The enterprise which is seen in the successful experiments in leather and metal continues to be as marked as formerly in papers. Any of the new silk flocks is worthy of being hung in the boudoir of a princess. Among new papers we may mention the "Piccolomini," which is the most vigorous design we have seen from Mr. LEWIS F. DAY, the "Seed and Flowers" by Mr. WALTER CRANE, the large "Vine" by Mr. SUMNER, the "Venetia," the "Coronæ Vitæ," the "Tree" by Mr. WILSON, and others by Mr. VOYSEY and Mr. STEPHEN WEBB. Mr. MUCKLEY'S skill as a flower painter has been turned to account, and there is a daring ceiling paper with geometrical patterns in brilliant colours, by Mr. VACHER, which is especially deserving of a trial. The enumeration of designs is, however, an inadequate manner of suggesting the character of the remarkable collection which is to be seen at Messrs. JEFFREY'S. The liberal treatment which artists are insured, and the extraordinary power of organisation which is seen in the reproduction of their designs have been already rewarded, but they will always be sure to merit the appreciation of architects.

STYLELESS ARCHITECTURE.

BOOKSELLERS and publishers have a sort of superstition about the advantages of a resonant style, although they are chary of producing works in which it is exemplified. In the market the needs of busy people who have little time for reading have to be met, but even the purveyors of what is known as light literature profess to have a liking for stuff of another sort, and the only sentences which they can quote are a few which were written in days when people had leisure to linger over a page and to store their memory with favourite passages. The worthy publishers who heard Professor GOLDWIN SMITH on Saturday night after their dinner must have been shocked. They saw before them a man who had been trained in Oxford, and was imported into America as a representative of the academical manner of looking at life. Yet at an hour when, under the influence of good wine, publishers are apt to imagine they are the guardians of what is best in literature, he ventured to wound their tenderest susceptibilities. The Professor hazarded the declaration that the absence of stylists like MACAULAY and CARLYLE was not so great an evil as had been supposed, nor was that the worst of styles which was no style at all. What was to become of the Row and Albemarle Street if a belief of that kind were to spread? It would mean that people would become still more disposed to read newspapers, periodicals and other unbound things, and would avoid books. For in a publisher's eyes the great difference between books and other products of the printing-press is that one class is supposed to possess style, while the other is deficient in the quality.

What is generally taken to be style in prose was well described by COWPER, the poet, as setting periods to a tune. If you can keep up the tune long enough to make it familiar to the ear much will be forgiven. You may omit the name of an authority from whom you take a text, if, like JOHNSON, you describe him as "an ancient poet unreasonably discontented with the present state of things, which his system of opinions obliged him to represent in its worst form." In conversation one would say "LUCRETIUS," but prose that is stylish must not resemble ordinary speech. Or you may define a net as "anything reticulated or decussated at equal distances, with interstices between the intersections," for as long as we gain style we may readily sacrifice clearness. JOHNSON'S volumes used to be given as presents to young clergymen with literary ability, in order that they might acquire from them an impressive way of instructing rustic congregations, and "the Trade" has still faith in their virtue. CARLYLE and MACAULAY are also admired for their grandiose manner of saying things. A man could not hope to succeed if he wrote to his lady-love or to a client in the manner of either of them, and no vestry or local board would listen to him if he attempted to explain plans or to excuse the ordering of a few extras by an imitation of their language. MACAULAY endeavoured to bring down his style to an everyday level by constant reading of Madame DE SEVIGNÉ'S letters to her daughter, but he could never gain elasticity. For him, his models and imitators, it was easier to mouth a speech than to speak it trippingly on the tongue.

The stylists are, to some extent, responsible for the belief which now prevails that a negation of style denotes some virtue. But other causes have aided. In the first place people are busier, and they have not the time to hunt for a thought in a heap of words. Then they have lost faith in many of the standards which were supposed to be infallible. GIBBON at one time was a sort of classic; now it is recommended that his pages should be handed over to schoolboys to be translated into English. His contemporary ROBERTSON was supposed to be no less stately and more diversified, but, according to WORDSWORTH, he was unable to write English, and all his sentences are cast in two moulds. The number of models of style in composition that have ceased to be worth reprinting is marvellous. Over a century ago HORACE WALPOLE said to somebody who consulted him on the subject, "Style, is it that you want? Go and look into the Plain Papers for a style." With all his frivolity, there was no submission of what was readable, and he preferred news-

papers to books because they were not pedantic or affected. It was in a similar spirit that DE QUINCEY said, and he was not an enemy of the English masterpieces, "The pure racy idiom of colloquial or household English must be looked for in the circles of well-educated women not too closely connected with books." In their circles, as in the newspapers, the old pomposity is out of place, and the thoughts which are uttered must be free and belong to the time. What is said is no doubt fugitive, but that is not the least charm, for the brightest is always the fleetest.

All this may appear to be true as regards literature, but dare we say that the absence of a formal style is as little to be deplored in works of art? At any rate, it will hardly be denied that the public, who are the patrons, the upholders, prefer the informal to the formal. In painting this is especially seen in France. Among the people in that country it is acknowledged there is a larger proportion who are competent to judge and to form a definite notion of the qualities which merit approval in a work of art than elsewhere. Now it is notorious that every Salon exhibits a further departure from the subjects and treatment which at one time were held in reverence. Where are now to be seen the examples of *le style sublime*, or *le beau style*, or *le style gracieux* which were once common in every exhibition? It may be said that the majority of the paintings which were supposed to represent those styles were not worthy to be accepted as works of art. That argument does not meet the case. Bad as the old works may have been, they were evidence of aims which have ceased to be effective. Artists no longer seek after the sublime because they doubt their power to create anything which is superior in character to the life that is around them. They could again employ the old-fashioned rules for producing beings of the kind, but if patrons are not exalted before the figures, like their predecessors in the old days, where is the advantage? Efforts are made to convince all classes in France about the advantage of believing in the classics of art and literature, but fate is stronger than any official course of education. When he ceases to be a student the Frenchman emancipates himself from what he believes to be a thralldom, and the things to which he was compelled to show reverence become more obnoxious because he is confident the change in his feelings comes from knowledge.

In England we can see the signs of a like tendency, although as yet it has not been so marked as in France. English architecture at the present time may be said to correspond with English literature. The respect for old literature has not expired among us, but a statesman endowed with a redundancy of words would not in our time, like FOX in the last century, when composing a book, reject every word that was not sanctioned by DRYDEN'S usage. A seeker after a style that will be "familiar but not coarse, and elegant but not ostentatious," no longer expects to secure it by giving his days and nights to the volumes of ADDISON. He knows it is necessary to do much more. The world does not want weak imitations of DRYDEN or ADDISON, of MACAULAY or CARLYLE, while the originals are to be obtained. It is only writing with a distinct, an uncommon character which is sure of a welcome. A new style that is worth notice is a gift which is not to be attained by labour alone, and for the majority of writers it is wiser to think more of substance than of manner.

The modern architecture of England also exemplifies that one or two ancient stylists cannot any more look down on a crowd of worshipping architects and clients. The disadvantage of the absence of that sort of idolatry has been impressed on us all. No lawlessness is supposed to bring about more momentous consequences. Now that chapels and gate lodges are rarely made to resemble classic temples, when colossal porticos are not accepted as indispensable in ecclesiastical and secular buildings, when the outside of a building is not necessarily at variance with the interior, no claim can be made to the possession of an architectural style, and when that is absent chaos must be approaching. Those who set up classic standards were, however, less rigorous than the Gothicists. As there can be little that is common between a Greek or Roman temple and an English church or other public building, some latitude in treatment of details was tolerated, but as Mediæval and modern buildings are supposed to be related closely, the

safest course for a designer of the latter was to forget that he was endowed with imagination and stick to precedent. At every step he was liable to be stopped and made to produce authority for his action. Ancient Egypt could hardly possess a more tyrannical body of arbiters than the Cambridge Camden Society. Rectors and curates naturally assumed they were possessed of its power to distinguish right from wrong in all things relating to masonry construction, stained-glass and needlework. A style was established for a while, but as it was insincere (for anything, however rational, that was not likely to secure the approval of the Society was sacrificed), and expediency became the dominant principle, it could not live long. It was often of little consequence whether the liberty of the men who derived advantage from submitting to the Society was renounced or not, but they seemed to find a grim satisfaction in displaying the zeal of converts by destroying all evidence of the exercise of liberty at an earlier time. Restoration thus became an effort to impart a fictitious style to what was old, and it was more ridiculous than the attempts to modernise CHAUCER, SHAKESPEARE and MILTON, for meddling with the buildings was to destroy their character. If the men who were inspired by the Cambridge Camden Society were less confident in the infallibility of the council's canons, much would have been preserved for the delight of succeeding times, but we suppose moderation is not to be expected from the upholders of any kind of style.

It can hardly be claimed that we possess an architectural style at the present time in England, that is, if by style is meant the utmost fidelity to precedents or the perpetual repetition of the characteristics of a model. Whether inspiration is derived from England, Holland, France or Germany, there is commonly something added or done which indicates the individuality of the architect. It is often said that the addition is not always an improvement, but whatever is done by a man's hand can be made the subject of adverse criticism. Another allegation is that the class of building in vogue has no right to be called a style. But whether it is a style or a medley, it gives more satisfaction than styles for which purity could be claimed. There are fewer complaints from owners and occupiers about the shortcomings of Free Classic than were heard during the Gothic revival. With all its æsthetic defects, there is no necessity that everyday requirements should be sacrificed to enhance the exterior dignity of a Free Classic building. Clients may be told that the freedom means an irreverential way of dealing with forms which time had sanctified, but they would be disposed to be more satisfied with the experiments on that account.

The endeavour to imitate closely either Classic or Mediæval buildings corresponded with the efforts to use a dead language for everyday affairs. Ecclesiastics who were bound to employ Latin were not long before discovering that Ciceronian purity must be given up. Clerical compositions will consequently not bear comparison for style with the writings of Romans who were inferior to CICERO, but if the style was imperfect, it was better adapted for documents which related to business. When, in our time, Latin is employed, it is indispensable that restrictions must be put on the thoughts, and in consequence the occasional exercises of high ecclesiastics and university orators in that language are only an exhibition of elegant trifling. In the same way when the grand style of English is attempted there is a loss of animation. The History by FOX, which is made up of DRYDEN's words, will not bear comparison for power with his speeches, and Professor GOLDWIN SMITH was probably recalling his sufferings under imitations of MACAULAY and CARLYLE, when he testified to the advantage of compositions in which there was no aping of stateliness. The thoughts which are not to be expressed in language that may be called styleless can hardly relate to this world, and it is no less true that the needs of public and private life in our time can be met by architecture which, without having the grandeur and purity of the Greeks or the soaring ambition of the Mediævalists, has that elasticity which makes it equal to the novel purposes which are so constantly arising.

CURRENT ARCHITECTURAL STYLES.*

THE title "current styles" somewhat imperfectly expresses the object of this paper. To do justice to a description of the current styles of architecture, at least in these days, would be altogether beyond the scope of a short paper, and, moreover, while extremely interesting, and to a certain extent profitable, it is a question whether, in the limited time at our disposal, in a convention of architects gathered from different parts of the province, the opportunity cannot be better employed. The object, then, will be not so much to attempt a full description of the many styles now prevalent as to briefly review some of the more important of them; to endeavour to look beneath the surface, and, if possible, ascertain the fundamental principles underlying architectural style, and from our investigation to deduce some conclusions as to how real progress may be made in the achievements of a profession than which there is none nobler in the realms of art or science.

The frequency with which, in matters pertaining to architectural design or buildings, the public propound to one the question "What style is it?" would be amusing were it not so often embarrassing. It is embarrassing for two reasons. In the first place it opens up the question, "What is style?"—one by no means easy to define. A thoroughly logical definition of the term is seldom attempted. Gottfried Semper says:—"Style is the coincidence in a work of art with the history of its coming into reality, with all the conditions and circumstances that are casual to its origin." Another authority defines "style" as "the language in which we express our thoughts, the natural expression of our requirements in building." But for the purposes of this paper it is not necessary to go further; these two definitions are probably sufficient to convince anyone that an explanation of the term is not quite so simple as at first it may appear. In the second place, the conundrum arises respecting the building or design in question: "Has it any style, and, if so, what?" The answer to this may be more difficult than the first. True, if the building were a copy of one of the structures of ancient Greece or of one of the scarcely less famous cathedrals of the Mediæval period, it would be easy for the veriest tyro to name its style correctly. Incomparably beautiful, however, in their respective classes as those buildings were, their exact reproduction in modern times is usually deemed a ludicrous mistake. The customs, manners, and conditions generally under which they were erected belong to a bygone age, and, charming as such structures might be to the eye, they would, except in rare cases, be wanting in two of the chief elements of the highest art, viz. by utility and truth. But, for the most part, the buildings on whose style we are called upon to pronounce are of a very different stamp. Erected to fill many requirements, and restricted by innumerable conditions, the average modern erection is of a complex character. In many instances, perhaps the majority, it is more than doubtful whether the building possesses any style at all. In others, the taste and skill of the designer have produced a building having an unmistakable air of character and individuality, but of whose style, in the ordinary sense of the term, we are not so certain.

In proceeding to discuss styles of architecture while we are primarily and chiefly interested in the architecture of our own Canada, we must, without any disloyalty or self-reproach, admit that while we have produced work which in its class compares favourably with that of any country, we are, architecturally, overshadowed on the one hand by the great and wealthy nation to our south, and, on the other, by the head of that mighty empire of which we are proud to form a part, and to the architecture of these two countries let us now direct our attention.

In reviewing current architecture in England, the traditions of the past are so intimately connected with modern work that it may not be amiss briefly to refer to the early history of the art. Beginning with the crude ideas introduced at the time of the Norman invasion, the progress of architecture as it slowly developed into the various phases of Gothic is clearly marked in the buildings which still remain as monuments of English art. With the exit of the Tudor style a new and outside influence can be plainly discerned.

Renaissance forms appear, first of a German and Flemish type, followed later by evidences of Italian and French inspiration, culminating in that grand achievement, the pride of all England, St. Paul's Cathedral. Since then the course of English architecture, at no time a particularly smooth one, has taken it through many vicissitudes. From the Classic to the Gothic, and from there to the Renaissance again, first of one period, then of another, such has been its course. The Gothic revival of the present century, ending perhaps with the erection of the London Law Courts by Street, was the last of anything approaching a uniform style. Since that time a spirit of eclecticism, the doctrine of selection, has reigned supreme. Every architect has felt free to choose this or that style as his

The First Portion of a new church, Port Glasgow, designed by Messrs. Pugin & Pugin, is to be started immediately.

* A paper read by Mr. Grant Helliwell at the Convention of Architects in Toronto, and published in the *Canadian Architect*.

fancy dictated, and the result has been an infinite variety of forms. This system prevails in England to-day, so that the term "current styles," as far as British architects are concerned, is a most comprehensive one. To those few men gifted with exceptional talent this has been no particular drawback. It has developed in a special manner their individuality. This is markedly apparent in the work of Norman Shaw, whose buildings, familiar to us all, delightfully charming in their scholarly picturesqueness, their freedom from conventionality, are a standing testimony to his genius, and yet they cannot be classed under the head of any known style, although possessing that quality in a strong degree. Another master in English art is his contemporary, Waterhouse, whose versatility is not less noticeable than his artistic talents. Although he has perhaps achieved his greatest successes in the Romanesque style, an illustration of which is one of the most noted of modern English buildings, the South Kensington Museum, the Manchester Assize Courts and the Town Hall in the same place, both in the Gothic style, gave him a world-wide celebrity, while his masterly treatment of the National Liberal Club building is an example of his genius in Renaissance art.

Time forbids mention of some of the best recent work by other well-known British architects, designed for the most part in some phase of Italian Renaissance, though by no means wholly in that style. But it is an undeniable fact that, with certain few exceptions, English architecture of the last decade shows little progress.

Interesting and instructing as it is to study the architectural types of English building art, it is with even keener interest and greater profit that we turn our attention to prevailing styles in America; for though bound by ties of kinship and political sovereignty to the mother land, in all those conditions which affect the subject of our discussion here, we have much more in common with our near neighbours on this side the Atlantic. We have the same climate and practically the same building materials, and even in our modes of living, our methods of business, and all the environments of national life we are more closely allied to them than to our honoured head. So that the consideration of current styles in the United States may apply equally to Canada, and for the purposes of this discussion we will consider both countries as one.

Any review of American architecture, apart altogether from the ancient buildings of Mexico, is necessarily brief, being of such recent beginning as almost to deny it a history.

A nation of Anglo-Saxon origin, and that not so very far back, nothing worthy of the name of architecture in its buildings dates over two hundred years, and until comparatively recent times it has followed so closely in the lead of England that what has been said of the latter country is quite applicable to the new land. About the time of the birth of the Republic a modified Classic style prevailed, now known as the Colonial, and many of the buildings of that era still remain to testify to the chaste and simple beauty with which they were clothed. But after this a decided retrogression took place, and for the greater part of a century few, if any, new buildings were erected having any claim to style. It was not until the beginning of the last quarter of this century that a distinctly new era in the architecture of the western world set in. That the restless vigour and energy so characteristic of the American people, and which in every other line has forced its achievements to the front, should remain quiescent in matters architectural, was not to be expected, and about the time above mentioned the bonds and shackles of traditional art were thrown off and an advance made into new fields of effort. The progress made has been most marked. Doubtless to the late H. H. Richardson more than to any other single individual is due the credit of the appearance, not of a new style, but of a new principle in American architecture. Trained in the modern Renaissance as taught in the schools of France, he early broke free from the limits of that style, and with his strong individuality took up the study of the round-arch architecture prevailing in Europe prior to the Gothic era, commonly known as Romanesque. In the hands of such a master work was produced which soon attracted the attention of his contemporaries and of the public. He above all men in his generation was the brightest example of that rare genius which can perceive and evolve the hidden beauties and possibilities of the work of past ages. Without slavishly copying, he was able to draw inspiration from every source and adapt it to the varying requirements of his art, and thus produced work which, while it bore the stamp of his own personality, challenged by its beauty and dignity the admiration of all beholders. It is impossible to say to what degree of perfection, had he lived, he might have carried his chosen style. Apparently his mantle has not fallen on any of his successors. True, the influence of his work has been felt far more since his death than while he was amongst us. Like a tidal wave the fashion—for so we may call it—for Romanesque swept the land from ocean to ocean. Many large and attractive buildings were and are still being erected in that style. Some enthusiastic but superficial observers loudly hailed

it as the long-called-for American style. But it was short-lived. Richardson had many weak imitators, but few true followers; they copied the forms, but with the underlying principles that guided the master mind, with that power of adaptation, that fulness of resource possessed by him they were unendowed. What was the result? Buildings, said to be Romanesque, rose by the thousand all over the continent, and the noble and dignified round-arch style was deposed from the lofty throne on which its greatest exponent had placed it to a position almost of contempt. As a consequence, those who did appreciate its charms and possibilities, and who, according to the measure of their ability, were thoughtfully and successfully working out the problems committed to their hands, forsook the style entirely and sought new *motifs* from other sources. Their methods of study and differences of taste led them in various directions; the spirit of eclecticism prevailed, and is still dominant.

There had been, even when the Richardsonian movement was at its height, some few men who had never inclined to the popular style; educated like him, in the French schools of architecture, thoroughly trained in and imbued with Classical art, they had remained true to their early training, and had all along been producing good work of the Classic and Renaissance types. The waning of the Romanesque brought this style of design into special prominence, and the reaction which followed the surfeiting of the public taste with the characteristic freeness and irregularity of the former only served to render the symmetry and precision, the studied proportions, the refined and delicate detail of the beautiful Renaissance the more attractive. The example of these leaders, prominent among whom may be mentioned the names of R. M. Hunt and McKim, Mead and White, was soon followed by other members of the profession, and the new order of things quickly spread. About this time the projected Columbian Exposition at Chicago offered an unprecedented opportunity for architectural achievement, and the selection of Renaissance and Classic styles for its principal buildings and the subsequent successful carrying out of the designs was all that was needed to make these styles perhaps even more popular than the Romanesque in its palmiest days. Still, though no other style or styles can fairly be considered as in the field for popular favour, the disciples and exponents of many other types of architecture are not idle, nor do they fail to find an appreciative and responsive public. The variety of style as exhibited to-day in all classes of buildings is simply amazing. A walk through a residential street in almost any of our cities or larger towns affords a striking confirmation of this fact. Here, for instance, we may see a large imposing residence, the great detached columns in the Ionic or Corinthian order extending through two storeys and supporting the entablature with its low, broad pediment, the wide verandahs, the central doorway with semi-circular fanlight, the broad square-topped windows with moulded architraves, all tending to carry one back to the old Colonial days. Close by is a handsome dwelling with a high steep roof with ornamental eaves, the circular corner bays rising through the several storeys and terminating in a graceful pointed roof, dormer windows, large and high, with slender crocketed pinnacles and sweeping lofty pediment and finial, window and door-openings with ornamented pilasters of slight projection and moulded enriched cornices, all with a degree of symmetry and balance and loftiness strongly suggestive of the French chateau. Across the way, possibly, is a dwelling of Elizabethan type, with coped gables of fanciful and pleasing outline. On a little farther and we pass several residences in what we will call, for want of a better name, the American dwelling-house style—lower storey built of brick or rough-faced stone, above this the walls and gables faced with shingles, sometimes without colour other than the soft silver-grey tint produced by the weather, but oftener stained in some of the pleasing hues of brown or olive; here is a tastefully designed oriel window, there a cosily recessed and deeply-shaded balcony; on one side the simple outline of the roof is broken by a graceful turret or dormer, on another it descends with sweeping curve to form the roof of a verandah. The general contour is certainly pleasing, the outline often picturesque, and there is an unmistakably homelike air about the whole that attracts in spite of many eccentricities and incongruities. It may be called the typical American home, in the production of which American architecture has gained its greatest success. But we are pre-eminently a commercial people, and may naturally look to the buildings devoted to commerce in order to gauge the architectural progress of the day.

In any reference to current architecture in this country the business buildings take a conspicuous place, and we will briefly discuss some of their most characteristic features. And here, as nowhere else, has been brought to our architects a problem for the solution of which there was absolutely no precedent. The tremendous expansion of trade and commerce during the last two or three decades has correspondingly increased the value of land in our great commercial centres, and has necessitated the construction of those enormously high buildings which are the wonder, if not the admiration, of all who visit us. These

buildings of twelve, fifteen, and even twenty storeys have been adversely criticised by some; but was it to be expected that in such an entirely new departure no mistakes would be made? The wonder rather is that such a measure of success as has unquestionably been achieved in the case of not a few of these gigantic buildings should have been attained in view of the extreme difficulties of the problem. In perhaps the majority of instances the designing of these tall constructions, in which the height is so greatly disproportioned to the width, has been so skilfully managed by the disposition of the horizontal lines that the effect of height has been to a large extent obscured. The Romanesque style has been most happily employed in many cases, the usual disposition of the parts, as seen in European Mediaeval structures, lending itself admirably to the requirements of the design, which is commonly composed of a basement boldly and massively treated, comprising two or three storeys, then a central division of several storeys in height, with disposition of arches, the whole composition terminating in an attic of two or three storeys. In the most successful buildings the angles have been admirably managed so as to give the appearance of strength and dignity necessary in structures of such size. Some of the later designs are in the popular Renaissance style, and show a very clever treatment of the problem.

A word as to prevailing styles in ecclesiastical work. In a nation of such cosmopolitan character as America, embracing an almost innumerable variety of religious beliefs, it might be expected that great differences of style would be found, and such is the case. Romanesque, Gothic, Mauresque, Spanish and many other types are represented, though for the most part it must be admitted to the discredit alike of their designers and the congregations for whom erected. In no class of architecture have the Americans so much to learn as in their church buildings. Still in their more recent works signs of improvement are not wanting. The notable competition, a few years since, for the great Episcopal cathedral of New York has done not a little to advance ecclesiastical architecture. Although, as pointed out previously, a great variety of styles prevails in church work, it is doubtful if any are as appropriate for this class of building as the beautiful Gothic forms, and the latest designs of perhaps a majority of our leading architects clearly point to this conclusion.

In her public and legislative buildings, with one or two notable exceptions, America has less claim to congratulation than in other architectural achievements, although here, too, the most recently designed buildings show vast improvement over earlier work. No reference to American architecture is complete without allusion to the Capitol at Washington, a building of which any nation might well be proud. Although it cannot be termed a modern building, yet, inasmuch as the style in which it was built is more popular to-day than when it was designed, a reference to it is specially appropriate here. It is too well known to need description, and it is questionable if a structure of such stately dignity and grandeur will ever cease to exert a powerful influence on the architectural productions of the American people. In this sketch of current American architecture may be seen much that is encouraging. That there is an abundance of life and vigour is evident, and that the character of our work has steadily and rapidly improved is equally apparent. Probably one of the most perplexing circumstances presented to our minds is the great variety of styles seen in our modern buildings, a spirit of restlessness, a lack of definite purpose which would seem necessary for the proper development of our art. Why is this so? Possibly one reason may be the deeper and fuller knowledge of the architectural styles of the past. If this is the case there need certainly be no fear as to the result, bearing in mind the fact that such knowledge includes not only an acquaintance with the form, but what is of vastly greater importance, a perception of the idea, of the principles underlying the outward form. To possess this knowledge and the power to apply it requires patient thought and study, but there is no other royal road to the true development of architecture. Or, again, a reason may be the search after new elements of beauty, fresh and varied forms of architectural expression. This, too, need cause no alarm. Have we not in the works of nature an infinite variety of beautiful forms from the designs of the Divine Architect refreshing and delightful to our senses? Can we wonder, then, in this age of versatility of the ever-changing forms of architecture? The impressive and stately monuments of Classic art cannot satisfy every condition of æsthetic taste, and it is doubtless in response to this characteristic of our nature that we may see in the case, for instance, of Domestic architecture, the signs of a return to the picturesque and quaint beauties of the half-timbered houses of a decade or two since in the very latest designs of some of our leading architects.

We may not look for the formation of a new style; all attempts in this direction have resulted in dismal failure, and this, after all, is not to be wondered at when we consider that the styles of past ages, admirable and beautiful as they are,

were not created in any such way. The degree of perfection to which they were brought was only attained after generations if not centuries of patient and laborious effort, in which the object to be gained was not novelty but a beautiful and natural expression in the best materials at their hand of the requirements of their age. And it is unquestionably in the same way only that any real progress can be made to-day in the true development of architecture.

TESSERÆ.

Early Paperhangings.

WITH the increased production of paper came the idea of applying it to the purpose of hangings for rooms. At first the aim seems to have been directed to imitations of tapestry, and to produce this was employed a material called flock, a kind of woollen cloth chopped small with a machine, strewn lightly with the finger and thumb over the paper, on which a pattern had been previously drawn with fat, oil or varnish, and the different colours and tints being carefully blended, an appearance of tapestry was thus obtained. This method is said to have first originated in England, and was invented by Jerome Langer, who obtained a patent for it during the reign of Charles I., dated May 1, 1634. According to an old French work a manufacture of this kind was carried on at Rouen some ten or fourteen years previously by a man named François, and was succeeded by his son, who continued the business for fifty years after with great success. Originally the material was of an extremely coarse description, and the flock projected considerably from the paper. In the reign of Queen Anne paperhangings were largely imported from China. Jackson, a manufacturer of paperhangings at Battersea, published in the year 1754 a work on the invention of printing in chiaroscuro and the application of it to the making of paperhangings, with fruits coloured in illustration. This book was probably used as a sort of advertisement of his own manufacture, and contains many just and well-sustained remarks, showing a cultivated and properly-directed taste. He purposed, instead of adhering to the old system (for it seems that paperhangings had reached some degree of perfection even then), to employ subjects of more interest than the mere repetition of flowers and ornaments, which prevailed so much that instead of being a principal, as they were, they should be merely an elegant auxiliary to designs of more dignified character, as, for instance, copies of the most celebrated classic subjects, statues and landscapes, and remarks that the persons who could not purchase the statues themselves might have these prints in their places, and thus gratify the taste of the possessor. He also proposed, instead of painting paperhangings in the ordinary way with size colour, that oil should be used, and argued the great durability of oil in comparison with size, and that the beauties of the colours continue as long as the paper can hold together, whereas in a short time the brilliancy of the other is quite lost and requires renewing. About the year 1786 Sheringham threw a new feature into the manufacture of paperhangings. This gentleman, who had spent many years on the Continent, returned about this time to England and established a business in Great Marlborough Street. His enterprising spirit and refined taste led him to engage a number of artists of first-rate ability—such men as Jones, Boileau, La Brie and Fuseli. He was thus enabled to introduce a style of decoration both unique and truly English in its character. He infused into the art a style which for beauty and grace was not equalled before nor since surpassed. Sheringham was indeed the Wedgwood of paper-stainers. About that time the Messrs. Ichardts, who had a manufactory at Chelsea, produced designs of most exquisite workmanship. Besides the mode then generally in use, they adopted a method of applying copper-plates engraved to form the outline, and by an under ground of silver and gold worked up by hand in varnish colours effects of the most beautiful kind were obtained, and they were highly illustrative of the ability of English talent when properly applied.

Influence of Proportion.

No increase of a proportionate object will ever give it magnitude and the sublime; these depend on extraordinary relation and excess of parts and proportions. Several years ago a French giant, upwards of 9 feet high, exhibited himself in London, but so just were his proportions that no one would give credit to his dimensions till they stood beside him; he was therefore accounted a kind of fraud, and the exhibition failed. But had he been disproportioned, his head small, his shoulders high, and his members excessive, he might have succeeded, even had he been a foot shorter. Had the nave of St. Peter's, 77 feet wide, been 90 feet high only, instead of 145; or if we were to suppose a stage raised mid-height and place ourselves upon it, we should be sensible of its vast latitude, and the effect of magnitude would have been produced as under a bridge. The Arc de l'Etoile, from the same reasons,

though as large as the front of Notre Dame (the arch itself is 48 feet by 95 feet, equal to the height of the nave, but of ordinary proportions and great simplicity of parts and members) loses its effect; the *arc monstre* is glorious to the *grand armée*, but not to the arts of their day, and is infinitely less artificial in its combination than the arches of St. Martin and St. Antoine, designed by the accomplished Blondel. If, then, the architect can obtain latitude, he should seek to carry out its effect by quadrate and comparatively low proportions; but if he adds altitude to his latitude, he loses his expense and pains, and he may find too late that half his dimension might have attained the same effect, since proportionate magnitude defeats itself. But as extreme latitude gives the sublime, so does its opposite extreme of altitude. In Cologne and Beauvais, the naves of which are $3\frac{1}{2}$ diameters in height, though scarcely more than half the actual width of St. Peter's nave—limited, therefore, in their dimensions to the usual cathedral width, yet nearly double the usual proportion—the sublime is completely attained, and disproportion again appears to be the efficient cause. But the optical consideration of the visual angle in which these several proportions present themselves is exceedingly important. Thus to the spectator of the dome of the Panthéon, the visual angle is 95 deg., while the same dome raised into the air at St. Peter's is only 30 deg. In the nave of St. Peter's the visual angle is 48 deg., that of St. Paul's Cathedral is 37 deg., while the vault of Cologne is only 22 deg. Since then the effect of magnitude is measured by the number of degrees in the visual angle, the architect will advert to this consideration as of extreme interest. We come, then, to the important conclusion that the sublime and the beautiful are to be found in the proper adjustment of proportions, rather than in dimensions; and we may infer that no increase of scale to the beautiful will ever make it the sublime. But the sublime is of rare occurrence: the use, however, to which these reflections may be turned by the practical architect, under limited means, is remarkably illustrated in the Casino at Chiswick, where the very circumscribed area of the rooms is compensated by their extraordinary height. Lord Burlington has given a nobility to very small apartments which no one could believe on seeing the plan alone, without visiting that elegant work.

The Art of the Homeric Period.

In the Heroic times, the Homeric poems, especially the "Odyssey," attest the refinement and skill to which many of the imitative arts of Grecian civilisation had attained. In embroidery, the high-born occupation of Helen and Penelope, were attempted the most complex and difficult designs; and it is hard to suppose that these subjects could have been wrought upon garments with sufficient fidelity to warrant the praise of a poet, who evidently wrote from experience of what he had seen, if the art of drawing had not been also carried to some excellence—although to painting itself the poet makes none but dubious and obscure allusions. Still, if, on the one hand, in embroidery and upon arms (as the shield of Achilles), delineation in its more complex and minute form was attempted, and if, on the other hand, the use of colours was known (which it was, as applied not only to garments but to ivory), it could not have been long before two such kindred elements of the same art were united. Although it is contended by many that rude stones or beams were the earliest objects of Grecian worship, and though it is certain that in several places such emblems of the Deity preceded the worship of images, yet to the superstitious art of the rude Pelasgi in their earliest age, uncouth and half-formed statues of Hermes are attributed, and the idol is commemorated by traditions almost as antique as those which attest the sanctity of the fœtich. In the Homeric age, sculpture in metals, and on a large scale, was certainly known. By the door of Alcinoüs, the king of an island in the Ionian sea, stand rows of dogs in gold and silver—in his hall, upon pedestals, are golden statues of boys holding torches; and that such sculpture was even then dedicated to the gods is apparent by a well-known passage in the earlier poem of the "Iliad," which represents Theano, the Trojan priestess of Minerva, placing the offering of Hecuba upon the knees of the statue of the goddess. How far, however, such statues could be called works of art, or how far they were wrought by native Greeks, it is impossible to determine. All that Homer calls the work of Vulcan, such as the dogs in the palace of Alcinoüs, &c., we may suppose to be the work of foreigners. A poet could scarcely attribute to the gods a work that his audience knew an artificer in their own city had made. Certain it is that the memorable and gigantic advance in the art of sculpture was not made till about the 50th Olympiad (B.C. 580), when Dipœnus and Scyllis first obtained celebrity in works in marble (wood and metals were the earliest materials of sculpture). The great improvements in the art seem to have been coeval with the substitution of the naked for the draped figure. Beauty and ease and grace and power were the result of the anatomical study of the human form. Architecture has bequeathed to us, in the Pelasgic and Cyclopean remains, sufficient to indicate the massive strength it early acquired in parts of Greece. In

the Homeric times, the intercourse with Asia had already given something of lightness to the elder forms. Columns are constantly introduced into the palaces of the chiefs, profuse metallic ornaments decorate the walls; and the Homeric palaces, with their cornices gaily inwrought with blue—their pillars of silver on bases of brass, rising amidst vines and fruit trees—even allowing for all the exaggerations of the poet—dazzle the imagination with much of the gaudiness and glitter of an oriental city. At this period Athens receives from Homer the epithet of "broad-streeted"; and it is by no means improbable that the city of the Attic king might have presented to a traveller, in the time of Homer, a more pleasing general appearance than in its age of fame, when, after the Persian devastations, its stately temples rose above narrow and irregular streets, and the jealous effects of democracy forbade to the mansions of individual nobles that striking pre-eminence over the houses of the commonalty which would naturally mark the distinction of wealth and rank in a monarchical, or even an oligarchical, government.

Vitruvius's Principles.

The principles of composition which he would have us ever keep in mind in the formation of a design are six—ordination, disposition, eurithm, symmetry, decor and distribution. Ordination he defines as "the adjustment of the sizes of the several parts to their uses, and to the general scale of the building." Perrault and Newton have quite altered this part of the text of their author, the former confessedly and without authority; whilst Martin, Galiani, Sir H. Wotton and others have been at a loss to comprehend what *ordinatio* meant, though it evidently stands for that principle of the art which teaches us to give to the parts of designs their appropriate size; for instance, to the several apartments sufficient area for the purposes to which they are dedicated, without making them disproportionately large for the rest of the structure; it requires that to doorways, corridors, stairs, &c., sufficient width be given for the number of persons likely to frequent them; to windows size sufficient for the due supply of light; to supports sufficient but not excessive thickness or strength, &c. Disposition he defines as "a convenient collocation of the parts, and a desirable effect in the composition (putting together) of the work with respect to quality." As then ordination proportions their sizes, so disposition arranges them with reference both to their use (*apta collocatio*) and the general effect of the composition. Eurithm, Vitruvius says, is "a slightly appearance and a suitable look in the composing of members (*i.e.* forming them out of their simple elements), and is secured when the members are of a height suitable to their width, and of a breadth proportioned to their length, and, in short, when all things accord to their own proportion." "So symmetry," he adds, "is a proper concord of the members of the work itself, and the accordance of any given one of the several parts to the appearance of the general form." Eurithm then regards the ratios or relations of the dimensions of any single member, and symmetry the relations of one member to another, or of any given dimension of one member to the corresponding dimension of another. Proportion is therefore of two kinds according to Vitruvius, viz. eurithmic and symmetric—a distinction lost sight of by all his annotators. The former exists between the height of a column and its diameter; the latter between the height of the column and the height of the entablature, and also between the diameter of the column and the width of the intercolumn. Eurithmic proportion obtains between the width and height of a door or of a window, symmetric between the door as a whole and the window as a whole, and between the widths and the heights respectively. Decor-consistency or propriety he defines as "a correct aspect of a work composed of parts, approved with reference to precedent or authority, and is threefold, as it relates to statio, custom or nature." The first translated "station," "circumstance," "stanza," "abitazione," "*situation d'un lieu*," "*etat des choses*," "*statuo*," by Newton, Gwilt, Barbaro, Orsini, Martin, Perrault and Galiani respectively is exemplified, when temples to Minerva, Mars, Hercules, &c., are executed in the Doric order as suited to their stern attributes, and shrines to Flora, Venus, &c., in the Corinthian style to accord with the tender and delicate natures of these latter divinities. Conventional propriety, he says, forbids the infringement of usages approved in all ages—for instance, the introduction of triglyphs into any other order but the Doric, or of dentils into this. Distribution, his sixth and last principle, he explains as "an advantageous dispensation of the materials and site, and a careful and rational regard to economy." As a further explication of his meaning, he adds the Greek term *oikonomia* as a translation of distributio, a word more nearly equivalent to "stewardship" than to any other expression in our language. From this we may understand that it is the province of architecture under this aspect to furnish all the requisite parts of the design without lavish expenditure, but in such manner and measure as may be best afforded by the circumstances of the case. These, then, are the principles of architectural composition which Vitruvius lays down. Ordina-

tion, by which the parts are made of a size appropriate to their use; disposition, by which they are placed in convenient and effective collocation; eurhythm, or the due proportion of the parts, each in itself; symmetry, or unity of proportion between all the parts and the whole; propriety, or consistency and distribution or economical provision of all the essential requisites.

Horace Walpole and Strawberry Hill.

It certainly says very little either for Walpole's discrimination or taste, that with such examples as Eton College and Hampton Court just by, to say nothing of numerous others of ancient domestic and collegiate architecture which he must have been acquainted with, he should have patched up his house at Strawberry Hill with the most wretched "Carpenter's Gothic"—not only sheer absurdity as to style, but so thoroughly barbarous and uncouth in itself as almost to proclaim his ignorance, and convince us that he did not at all understand the mere elements and rudiments of the style which he set himself up as a judge of. It is true he endeavoured to avert criticism by affecting to speak disparagingly of his building, and as a mere plaything for his own amusement; but then the same excuse might be pleaded by any one, if not in justification of his taste, of his right to indulge it, however bad. There would be nothing at all inconsistent at least in an ignorant man's saying, "I know what pleases myself, and so that I do but satisfy myself that is all I seek; I do not ask other people to approve of my taste, for it is quite matter of indifference to me whether they do so or not"; but for an *arbitrator elegantiarum* in architecture to hold the same argument is strange indeed. His right to do as he did was most unquestionable, but the puzzling question is how, if he really possessed the taste the world gave him credit for, he came to do as he did in the first instance, and could afterwards endure to look upon the monster of his Frankenstein creation—"To please himself" is no answer, since there lies the puzzle. "To please himself" is merely acknowledging that, as it was a reflection upon, so it was the reflection of Walpole's own taste, when laying aside his superfine critical airs he gave himself up to it without any ceremony. Those who are good judges of taste of a different kind generally take care to please themselves by reserving some of the choicest portions and tit-bits in the dish which they are helping their friends to. Again, it is but a lame excuse for both Horace Walpole and Strawberry Hill, to say that his means for building were limited, and would not allow him to do more; as a structure it might have been equally flimsy or more so, yet might have been made to exhibit correctness of design and characteristic detail—at any rate, to manifest some kind of feeling for art and some real gusto, although in contradiction to all previous examples. Dallaway talks of a person's being able "to contemplate all that is fascinating in Gothic architecture at Strawberry Hill." Can it be an error of the press—a blunder of the printer, who converted into "fascinating" what was intended for "farical"? Let us hope for the credit of criticism that such is the case.

William Smith and Applications of Geology.

At the close of the last century William Smith had made himself much more accurately acquainted with the actual order of superposition of the secondary strata in England than any person then living. He was also one of the first to apply this knowledge to important practical purposes. About the year 1800 his reputation for "draining on new principles" was thoroughly established in the West of England, and on the occasion of numerous landslips taking place near Bath, he was employed to prevent if possible a recurrence of this mischief, which he effected by tunnelling into the hill on which the land was slipping and intercepting the springs, and then providing a direct and convenient channel by which the water could be discharged. In the year 1811 Smith was again employed to report on a subject of practical science connected with the drainage of strata. About that time numerous canals were being cut in different parts of the West of England, and these, crossing the oolitic hills, were found to be particularly liable to accidents of leakage, being cut through open jointed, and sometimes cavernous rocks, alternating with water-tight clays. In the passage across the former rocks, and more especially when the summit level of the canal occurs in them, the water escapes almost as fast as it enters, and all the skill of the engineer in puddling and making an artificial bed is sometimes exerted in vain, and cannot prevent great and ruinous loss. But the existence of open joints and caverns is by no means the only nor indeed the greatest source of injury, for innumerable small faults or slides traverse the country and confuse the natural direction of the springs, rendering them short in their courses and uncertain and temporary in their flow, weakening by their irregular pressure every defence that may be opposed to them and causing leaks, which let through a portion of the water contained in that level of the canal. The general remedy for all these evils was understood by Smith, and proposed by him for adoption. It is the entire interception of all

the springs which rise from a level above the canal and pass below it through natural fissures and cavities. This is a process requiring great skill and extensive experience; some of the springs, for instance, which it is most important to intercept come not to the surface at all in the ground above the canal, but flowing naturally below the surface through shaken or faulty ground, or along masses of displaced rock which extend in long ribs from the brows down into the vale, emerge or attempt to emerge in the banks of the canal; these no ordinary surface-draining will reach, and none but a draining engineer well versed in the knowledge of strata can successfully cope with such mysterious enemies. But Smith, confident in his great experience, not only proposed, by a general system of subterranean excavation to intercept all these springs, and destroy their power to injure the canal, but further to regulate and equalise their discharge, so as to render them a positive benefit. This he would have accomplished by penning up the water in particular natural areas or pounds which really exist between lines of fault in most districts, or between certain ridges of clay ("horses") which interrupt the continuity of the rock, and divide the subterranean water-fields into limited districts, separately manageable for the advantage of man by the skilful adaptation of science.

The Loggia of the Vatican.

Although the paintings in the Loggia of the Vatican pass under the name of Raphael, it is not pretended that they are the work of his hand, nor even his designs. He was indeed the originator and director of the whole, and the character and influence of his taste is visibly stamped in every part. But his coadjutors in the work were artists whose names are inferior to none in the Roman school but his own, such as Giulio Romano, Perino del Vaga, Benvenuto Tisi and others, who were occupied not only in the execution but in the invention of the details. Francesco Penni and Andrea da Salerno are particularly noticed as being employed for the figures, Giovanni da Udine for the fruits and flowers and Polydore Caravaggio for the reliefs. Quatremère de Quincy is of opinion that the sculptures of the Parthenon were produced by similar means, Phidias there performing exactly the same part as Raphael in the Vatican, and it is indisputable that the combination of unity of design with variety of detail which characterises Gothic architecture could have been produced only by the same system, and by employing the minds as well as the hands of those by whom the decorations were executed. When we see perfection attained in three distinct styles of art, in three distant ages, by means precisely similar, it is not too much to assume that these means are probably the right ones. The Loggia of Raphael form an arcade in thirteen compartments. The arches are open, or at least were so originally, towards the court, of which the Loggia forms one side. The opposite side is a wall pierced with windows, one in each arch, giving light to the suite of rooms which contains the great frescos of the painter. The ceiling of each compartment forms a square cove, on the sides of which are the panels containing the series of scriptural paintings, the engravings from which are known as Raphael's Bible. These are his own designs, and some are known to have been touched with his hand. Both the lateral and cross arches are supported by pilasters about 16 feet high, panelled and decorated with coloured arabesque on a white ground. Each pilaster on the wall side is flanked by a half pilaster, in which the arabesque is carried through on a smaller scale of composition. Notwithstanding the great variety in the composition and details of these works, we shall find a general unity of design prevailing throughout, with the exception of the last five of the series. Whatever form the composition may take, it is rendered subservient to the introduction of four medallions or tablets, relieved from the background in stucco, of contrasted shapes, one like an antique shield, the next circular, the third rectangular and the fourth in the form known as the *vesica piscis*. These medallions occupy the upper part of the pilaster, to the extent of about one-third of the whole panel, while the lower part, to the height of the dado, or somewhat higher, is generally filled in such a manner as to afford a weight of colour, sufficient to support itself by the side of that member of the architecture and the members introduced into its panels, following in this respect the practice of the ancients. These medallions might appear to violate the due balance of the arabesques, if they were identified with them; but the composition is rescued from that fault by the separate character given to the decoration of the medallions, and by their being detached and hung, as it were, independently upon the background. In the general arrangement of the whole, these medallions perform a very important part, connecting the pilasters with the panelled stuccos adjoining, both by their relief and by means of an accordant style of decoration and a similarity in the subjects represented upon them, neither of which could have been well embodied in the arabesque itself. But it must be admitted that these compositions, considered separately, are somewhat unequal.

NOTES AND COMMENTS.

THE inquiry into the working of the Technical Education Act, which Lord NORTON proposes, cannot be considered as premature. Unless we are mistaken, it will not take many days to discover how useless is much of the expenditure. A slight revelation of the weakness of the system is afforded by the official confession that many of the casts purchased as models are unsatisfactory. It is not necessary to say that the Technical Education Board proposed to find a remedy by despatching a commissioner in state to visit the Continent. For the last forty years, whenever a simple difficulty arose or a defect was discovered, the occasion was seized to arrange a continental tour for some official connected with the Science and Art Department or its predecessor. By this time there ought to be enough reports available to show the number of panes of glass in every technical school in Europe and the cost of scrubbing the floors. In the present case Professor MIDDLETON, who had started on a purchasing tour for South Kensington, voluntarily offered to look after the casts without extra charge. He has been authorised to expend 500*l.* on them. When it is remembered how much money the Science and Art Department has managed to disburse, it is remarkable that the country has not yet acquired a sufficient number of objects which could be reproduced as casts for the benefit of the humble students who join technical classes. There is no doubt the South Kensington Museum possesses many valuable things, but, whenever a test is applied, it is found that every section is no less deficient in what is required than that of casts for elementary purposes, and it becomes necessary to appeal to foreign help. In the fifties there was some excuse for subjection to the continental teachers, but now it has become humiliating.

THE Earl of MAYO has prepared a scheme for the formation of an Arts and Crafts Society for Ireland. It is proposed, in order to carry out the objects, to hold an exhibition of Irish arts and crafts in Dublin during the autumn of 1895. For that purpose a council of a thoroughly representative character will be formed to take charge of the arrangements. A guarantee fund of at least 1,500*l.* is to be raised. A committee of selection will also be constituted to decide, when exhibits are sent in, whether they are worthy in their different classes of a place in the Arts and Crafts Exhibition of Ireland. All firms, societies, tradesmen, artists, designers, and individuals who are interested in the various crafts will be invited to send exhibits. It is intended that at all exhibitions held under the auspices and direction of the Society, the name of the artist, designer, workman, as well as the name of the firm or tradesman employing them, shall be clearly set forth on all exhibits. Irish artists and craftsmen resident in Great Britain may send exhibits. Originality of design and form is desired in the objects sent; therefore, no absolute copy of old or modern work can be accepted. The first exhibition is to consist of examples of architectural designs, bell-founding, bookbinding, cabinet makers' work, cast-iron, embossed leather, embroidery, engraving, lithography and book illustration, gesso, stucco and sgraffito work, glass, gold and silversmiths' work, hammered ironwork, lacemaking, lapidary work, poplin making, porcelain and pottery, printing, repoussé work, seal-cutting in stone, brass, and steel, stone and marble carving, terra-cotta, wall-paper designs and wood-carving. We hope the Arts and Crafts Exhibition will be more fortunate than the last exhibition of Irish industry at Kensington. As the sum to be raised for six months' expenses is most modest, being only 1,500*l.*, there cannot be much of a display, but that may not be without advantage.

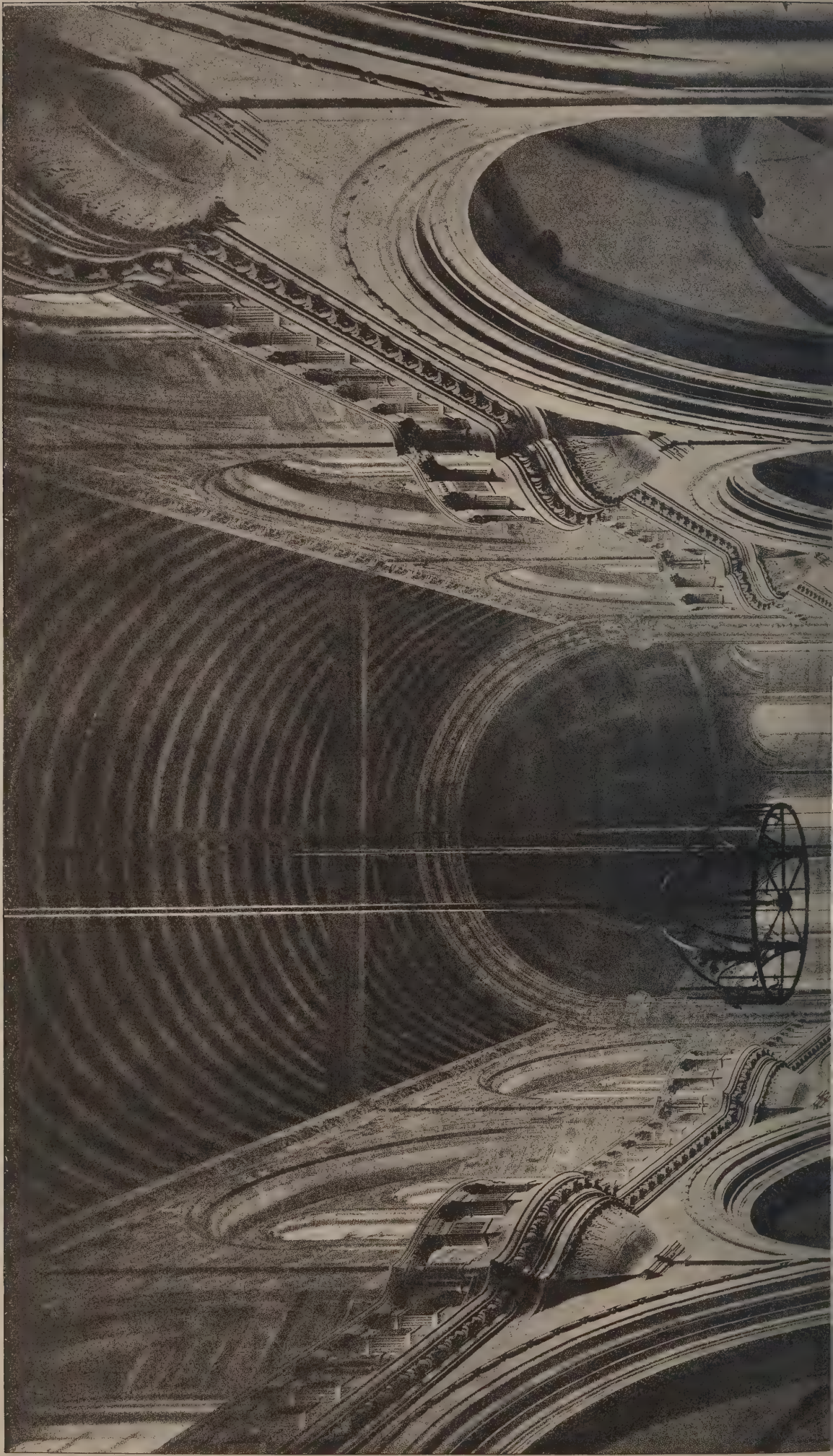
THE vandalism of one of the guardians of the treasures of the Cathedral of Sens, by which the chasuble of St. Thomas à Becket has been mutilated to gratify a woman, is likely to make the French people insist that the national property shall be entrusted to more careful hands. That the vestments are genuine is generally believed by archaeologists. The Archbishop of CANTERBURY fled to Sens to consult with the Pope, who was also a fugitive in that city, and afterwards remained there for about six years. It is not unlikely that he would leave vestments

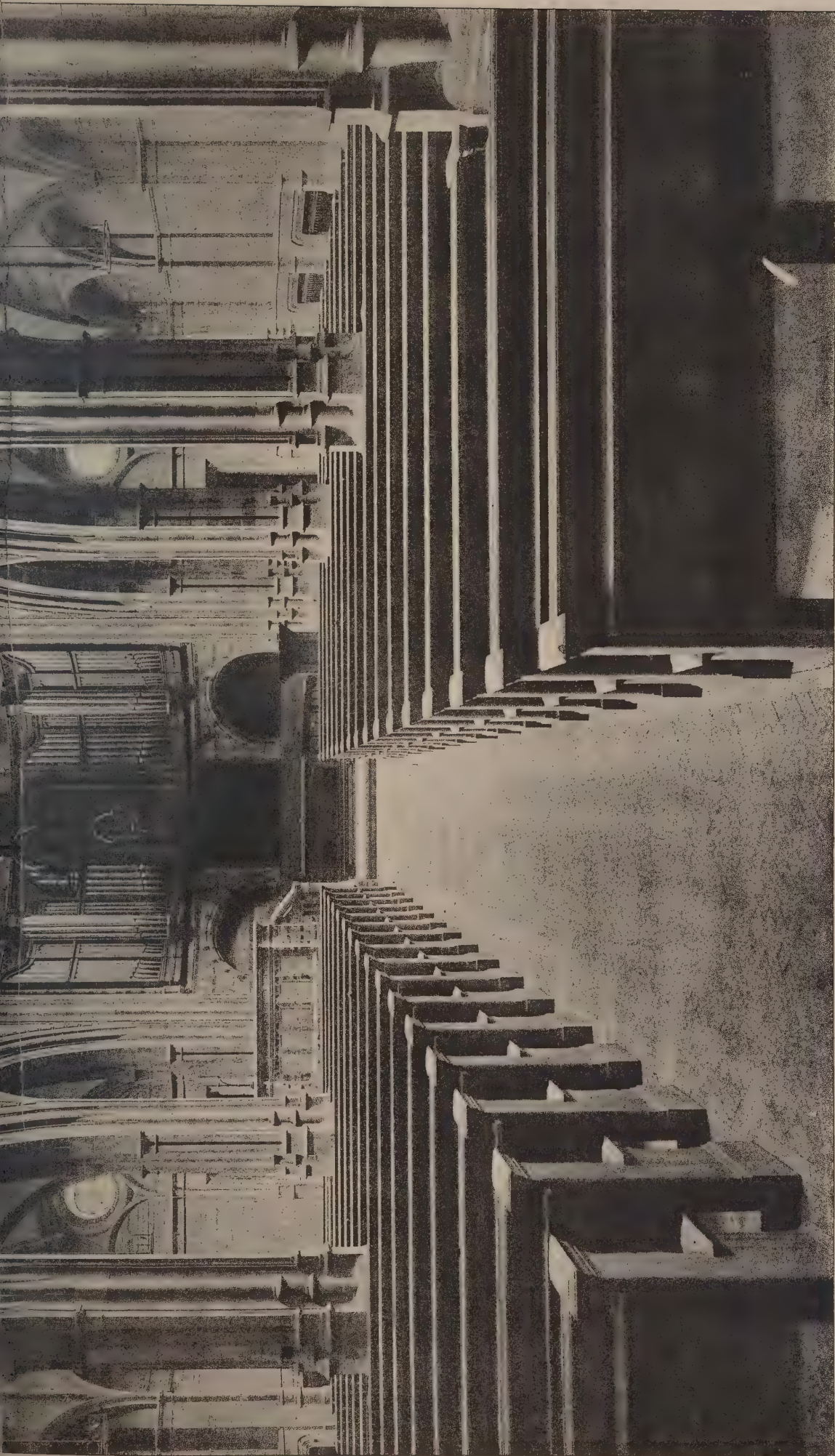
behind him, which were probably borrowed from the Archbishop of SENS. A part of the chasuble was cut out with an absence of secrecy that suggests how little value was attached to the antique by the clergy. If inquiry were made it is possible many other acts of vandalism would be revealed. It would be better to allow antique remains to rest in places where their interest is enhanced by associations; but if the authorities of a cathedral cannot restrain their hands from vandalism, it would be wiser to remove temptations from them, or to insist that an officer belonging to one of the museums should have the charge of all articles that can be mutilated.

ARCHÆOLOGISTS have reason to be grateful to PROSPER MÉRIMÉE for his efforts as founder and director of the department which has charge of ancient buildings in France, although he inspired operations of renewal which were not always advantageous. As a writer of short stories like "Colomba" he is almost without equal, while his historical and other books would by themselves gain reputation for another writer. His countrymen have not, however, adopted the usual course to uphold MÉRIMÉE'S reputation. There is no statue of him in a public place, and his name does not appear on a plaque as a title for a street in Paris. The explanation is that MÉRIMÉE was attached to the imperial senate. Many other men who appeared to be bound to the late court were forgiven, for they appeared to be only playing parts. But MÉRIMÉE, who had known the Empress from infancy, endeavoured to watch over her interests, and his fidelity was a crime which no literary ability could condone. An admirer who is the owner of an *impasse* has decided to compensate for the neglect of the Municipal Council by changing the name it bore, *Impasse des Belles-Feuilles*, into *Rue Mérimée*. Let us hope the tenants will not resent his efforts and compel him to reduce the rents.

IT is remarkable how persistent lawyers are in their endeavours to make the sheets of the Ordnance Survey be accepted as evidence in the law courts. The Scottish courts witnessed one of those efforts, but it was defeated on Monday last. The action was between two proprietors over a weir on the Tay. The plaintiff's case was that a weir which used to extend across a part of the river had been extended gradually by the defendant until it reached from bank to bank, causing damage to a salmon fishery, for which 200*l.* was claimed. The defendant maintained that the weir from time immemorial was constructed across the river and that his operations consisted solely in repairs to the foundations. A great many witnesses gave evidence for both parties. The plaintiff was apparently a stranger, and seeing on the Ordnance Survey of 1864 that the weir was represented as occupying no more than about two-thirds of the waterway, he concluded that the extension must be the work of a recent period, and the Ordnance map was relied on in support of his contention. The judge, however, laid down that in the absence of any oral evidence from the persons who made the survey, or of the circumstances in which it was made, the map could not be accepted as evidence. It would, said his lordship, be manifestly most unfair without knowing a great deal more than they did to attach any importance to the map, because it was quite possible that the survey might have been made at the time when one end of the dyke was temporarily washed away, or when the river was so high as not to show it. But if the map had been proved in the proper way there would still have been a difficulty in reconciling it with the rest of the plaintiff's evidence, for most of his witnesses said that the free space between the end of the weir and the bank was only about one half the breadth shown on the map. Judgment was therefore given in favour of the defendant with costs. A case of the kind must compel people to believe that the Ordnance maps on a large scale are of little use. They cannot be trusted as exact representations of detail. The surveying of that part of the river which was the scene of the dispute must have cost the country a good many pounds, and then there was the expense of engraving. Probably the only copy of the map which was purchased since the publication was the plaintiff's, and by misleading him he has become involved in a very costly lawsuit.

The Architect, April 20th 1894.





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FRENCH PROTESTANT CHURCH, SOHO SQUARE.

ASTON WEBB, Architect.



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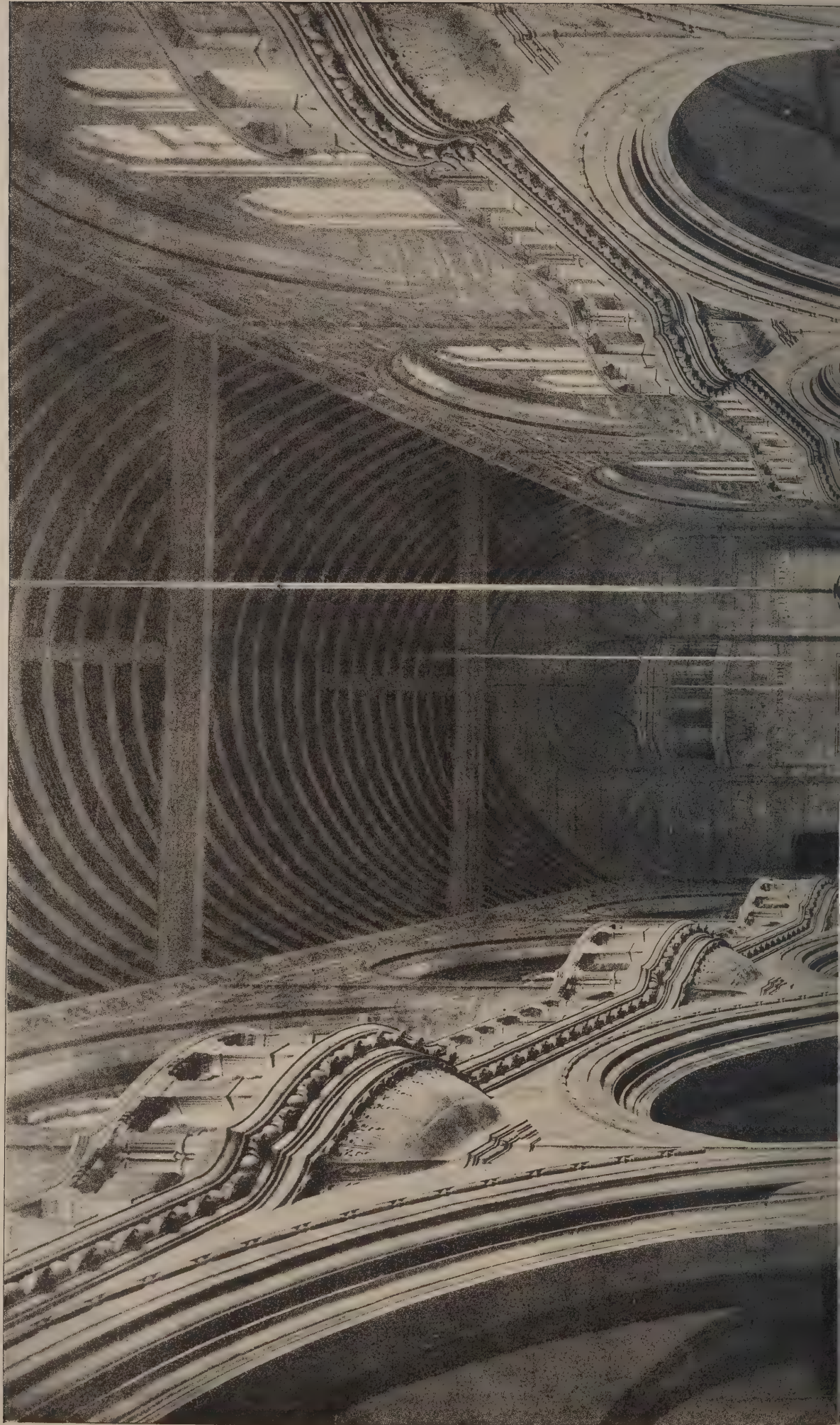
SANTA MARIA DEL MAR, BARCELONA.

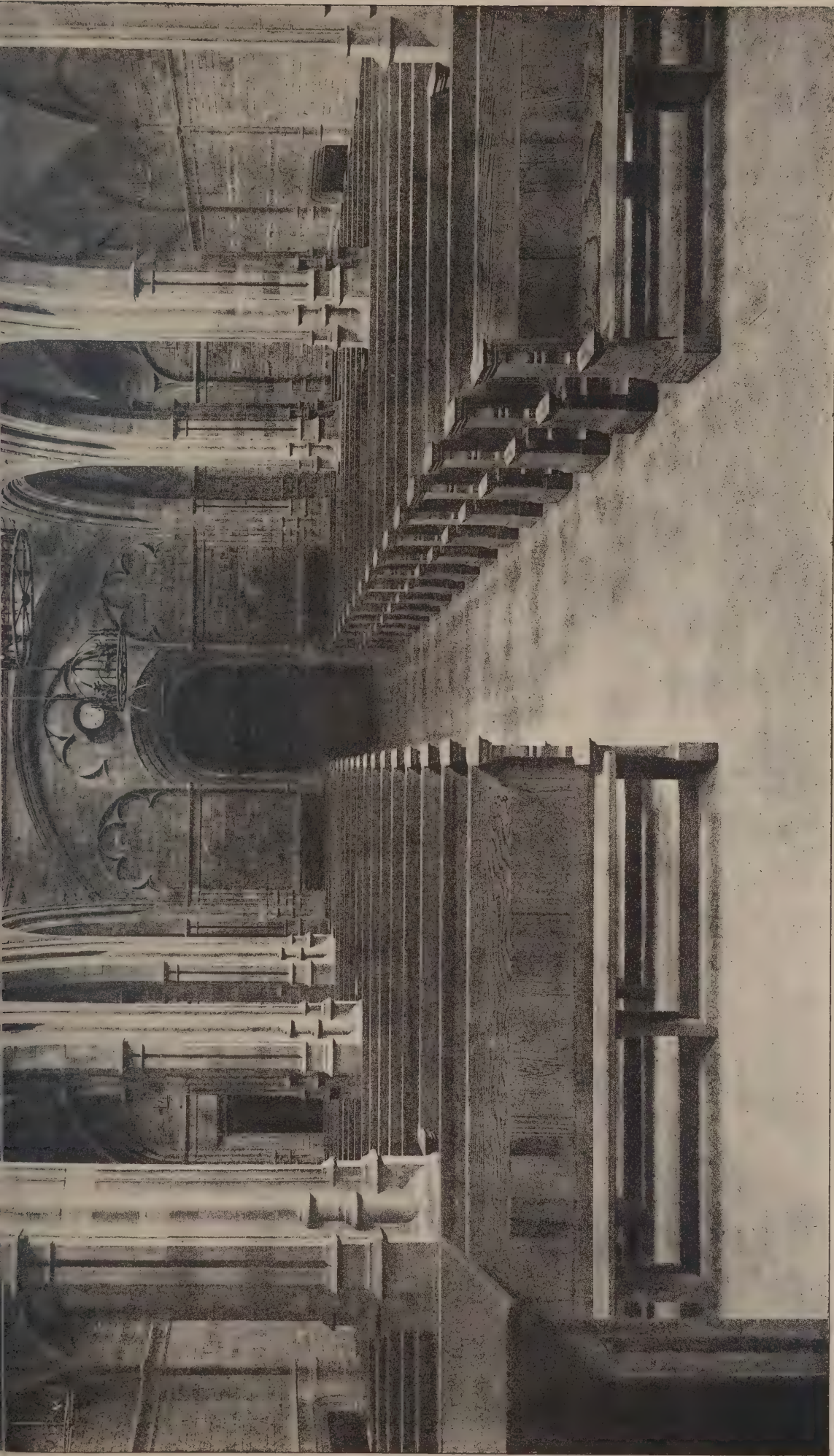
By FRANCIS W. BEDFORD.



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A STREET IN GRANADA.





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FRENCH PROTESTANT CHURCH, SOHO SQUARE.—SOUTH END.
ASTON WEBB, Architect.

ILLUSTRATIONS.

FRENCH PROTESTANT CHURCH, SOHO SQUARE.

FRENCH PROTESTANT CHURCH, SOHO SQUARE.—SOUTH END.

SANTA MARIA DEL MAR, BARCELONA.

A STREET IN GRANADA.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Architectural Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. It was announced that the annual soirée would be held on the evening of the 4th prox.

Mr. W. HOWARD SETH-SMITH read a paper on the

Bases of a Successful Architectural Practice in the Twentieth Century.

He said:—My subject is a well-worn—shall we say a threadbare one? For this I crave your pardon, but still hope that its perennial and vast importance, and perhaps a few new points of view which I shall take this evening, may invest it with some life, interest and usefulness, and may promote discussion.

Architecture requires four qualities in its creator:—1. Common sense. 2. Thoughtfulness. 3. A cultured sense of beauty. 4. Skill in expressing this by drawing.

Modern engineering is the product of common sense, thought, and skill in drawing, without the sense of beauty, and is therefore not architecture, in spite of Mr. Beresford Pite. The public have plenty of common sense, and engineering is accordingly the most popular profession. The public is in sympathy with, where it does not create, the characteristic conditions and tendencies of the age, and hence the inexpediency of the devotion to antiquated ideas which has largely contributed to alienate the public from our profession.

If we would be successful architects we must above all things adapt ourselves to these characteristic conditions and tendencies of our own day. What are they? Firstly, the worship of mind rather than of money or of art. It is pre-eminently the age of science, and woe be to the architect who, in the exclusive pursuit of that which as artists we all love best and would fain devote our whole time to, overlooks this fact.

The result of this worship of mind is an immensely increased demand for education, especially in professional men, with the inevitable result that those who intend to excel (I am not referring to men of special natural endowments; we may safely leave genius to take care of itself: I am arguing for men of average ability, this class including the vast majority of us) must be prepared to prolong their infancy in proportion to their determination to succeed. I use the word "education," of course, in its wide sense of expansion of the mind in many directions, and in as great a degree as is practicable. None will, I think, dispute this tendency. The formation of all professional societies is a concession to this condition of things.

The outcome of this tendency is the demand for some means (other than that of experience acquired by practice) of ascertaining the possession of superior culture as entitling to its confidence those who profess to advise the public. The only means yet devised is public examination of our students and due registration of the result. The decision in favour of examinations, in spite of the drawbacks of the system, is as general as is the opinion that the early training for all professions should be as wide and general as possible, the specialist study thus being better grounded and pursued more intelligently and safely. The election of experienced practitioners to membership of societies may have sufficed in the past as a rough-and-ready test of qualification, but much more is demanded nowadays. This is clearly seen in the establishment on all hands by professional bodies of examinations as a condition of membership.

A second phenomenon of our times is the reduction of large fortunes and large incomes, the distribution of money, and the consequent probability of our patrons consisting in the future more largely of the non-cultured and non-artistic class—a class which affects art, but knows little or nothing about it, but in my experience is willing to be advised and led.

A third condition is the distribution of means of culture by high-class schools, university extension courses, good provincial art libraries, technical schools, cheap travelling, &c. The provincially trained architect may by these means be in the future as good a man in art and perhaps in respect to general experience as his metropolitan brother, and will be consequently more largely employed in important undertakings.

The teaching of these considerations is clearly that the public first of all requires us as a profession to be thoroughly qualified all round—skilled planners, masters of the various principles governing the building trades, critics and directors

of all departments of building, experts in building law, &c.; they further teach us that we must devise some means of letting the public know that we are so qualified. I know many of my artistic critics will cry out I am degrading our art by such a statement, but I make it emphatically, and I make it in the interest of art, as I shall endeavour to prove.

I would ask all those who appear to be in opposition to this view to answer candidly the following questions:—

1. In spite of some little improvement, does the British public love, and is it able or willing to pay reasonably for art in our work? (I am quite aware that good architecture need not be costly—on the contrary, it is generally less costly than bad, owing to its detestation of display and love of invention—but it would be absurd to argue that it costs no more than the purely utilitarian.) Addressing the Liverpool Art Congress only about six years ago, Sir Frederick Leighton, as you may recollect, said:—"Our countrymen have no adequate perception of the place of art as an element of national greatness; they do not count its achievements among the sources of their national pride; they do not appreciate its vital importance in the present day to certain branches of national prosperity; while what is excellent receives from them honour and recognition, what is ignoble and hideous is not detested by them—is indeed accepted and borne with a dull acquiescence; the æsthetic consciousness is not with a living force impelling them towards the beautiful, and rebelling against the unsightly."

2. I would ask, Do you profess to act as the censor and dictator in the complex technical and practical matters in connection with your buildings? If not, you will not at any rate dispute that your clients remunerate you on this understanding.

Is not the reason of our employment most frequently the utilitarian benefit our skill in planning and our knowledge of building business will insure? And is not the fact that an architect is so often not employed to advise in considerable building operations due to the fear of his artistic ideas enhancing the cost, or perhaps to the suspicion (alas! in so many cases the reasonable suspicion) that his training in practical building is not equal to that of the builder's?

The supreme problem before our profession is, therefore, how to establish public confidence in our fitness to be the guardians of our clients' interests. This cannot be done by appealing to an instinct for art which does not exist, but it can and will result from the establishment of a conviction that we have enjoyed a lengthy training in, and therefore possess a superior knowledge of, those departments of our work which the public do appreciate and must and will have. It is folly to reckon without your host, as many among us are endeavouring to induce our students to do, forgetting in their laudable enthusiasm (which the young architect is only too ready to catch, and, through want of experience, to magnify to a perilous degree) for artistic design that they happen to have been the lucky but small minority who are employed by the highly cultivated and wealthy few, while those they address will have in the vast majority of cases to struggle with the difficulties and disappointments of a more ordinary practice, a very large proportion of which will consist of utilitarian work.

In connection with the incidental difficulties and disappointments all architects meet with, I must relate an anecdote in connection with the legal profession which would apply with equal point to our own work. (As a hint to students on the subject of charges its application may be more questionable.) Some of you are doubtless acquainted with the Scotch term "fash."

Sir Edward Watkin was going through a lawyer's bill of costs, and coming upon the item "to fash, 30/," was puzzled. Sir Edward, who knows his way about pretty well, felt completely floored. He either sent for or called upon the solicitor, who happened to be a Scotchman, and asked what the charge 30/ for "fash" meant. "What is 'fash'?" The lawyer replied, "Pens, ink, papers, things you can't carry in your head and general mental anxiety." What a long bill for "fash" we architects might present.

The tendency of the agitation which would place architecture "on the same footing as sculpture and painting" will, if persisted in, throw more and more of our work into the hands of firms of builders who ostentatiously undertake to do the architectural designing as well as the contracting, and thus to lead up to a system which prevails in parts of the Continent, in which the public employ the builder and the builder the architect.

Supposing we can attain our object as a profession and win a much more general respect and confidence in our work, will not the result be immensely more beneficial to the progress of art than any improvement we can hope to attain by parading a qualification which is not yet appreciated by the majority of our employers?

Much indeed is now being done to repair the damage we have suffered in the past, and still suffer, from our haphazard training of young architects. The curriculum of our A. A. is, to my mind, by far the most useful and the most promising of

these efforts, for the two reasons, that it encourages and supplements the all-important pupilage system, and that it is directed not by theoretical educationalists but by a body of architects who ought to be able to judge as to the subjects most required and the relative prominence to be given to them.

I shall make no apology for referring more at length to the great controversial subject of examinations as a test of training. Apart from the enormous incentive they provide to systematic study, the public demand them as the only practicable method of enabling them to ascertain whether a professional man has had a proper training, and I have yet to see urged any reason sufficient to warrant the exclusion of architecture from compliance with this demand. The most plausible objection hitherto urged appears to be that engineers have never found it necessary to institute a compulsory test, but the very essence of an engineer's calling obliges him to have a thorough technical and practical training, whereas the essence of ours constitutes a temptation to neglect those interests to protect which our clients generally employ us.

I say emphatically that in the interests of art we ought to be thankful to the Institute for its establishment of a system of examinations. To preserve, improve and make them general should be our aim. Some of us may not have realised that their existence is threatened, but to my mind last year's decision of the Institute in favour of continuing an art examination as alone qualifying for fellowship of the Institute appeared to be a heavy blow struck at the whole system of the progressive examinations. That decision must frequently involve injustice to the Associates if the obligatory qualification for associateship by examination is still to be insisted on. Men who fail to pass the general examinations compulsorily qualifying for associateship necessitating four years' hard work, can now attain the higher distinction of Fellow by the mere fact of so many years' practice and in the production of some building of more or less architectural merit. That this resolution was urged and passed by the exertions of the majority of the more artistic men in the Institute I admit, but one cannot shut one's eyes to the logic of the decision. I believe it must result either in electing the Fellows only from the Associate class; in the election of Associates on much the same test as the Fellows; or perhaps in conferring the title of Fellow in future only upon such architects as have specially distinguished themselves in the province of art.

As to the improvement of the examinations, this is neither the place nor the occasion to go critically into such a question, even were I qualified to do so, and I will content myself with stating that the British public believe in a practical rather than in a theoretical training, that the cramming system must be by all means discredited and the weakest men must be encouraged. Also my conviction that the system of honorary examiners can never work satisfactorily, though I appreciate as fully as anyone the great services hitherto rendered by these gentlemen.

May I venture any further and say a word about registration? If so, I would ask, what is the Institute of Architects but a society whose object is the registration of qualified men? Would that its principles of obligatory tests might be applied to the profession at large. Of course this can only be done (oh! terrible word) by an Act of Parliament. I believe that such a measure might be drafted by the Institute as would obviate the main objections, whether just or not, urged against the present Bill. Such a measure promoted by the Institute would become law directly our legislators found time to deal with practical politics; the result would be to exclude untrained men from calling themselves architects, and so under false pretences obtaining work which only a highly trained person is capable of performing, and would put a stop to a state of things which has indubitably brought our craft into disrepute. And why should we not anticipate that as great an improvement would eventuate in the quality of the profession generally as has taken place in the ranks of the Institute as a result of its examinations, and that with the growing popularity of the profession art would begin to flourish and improve?

Many here will remember what the chairman of the London County Council said during the discussion on Mr. Collard's paper. Mr. Hutton said that, "In his judgment, as a layman, he considered that the architectural profession suffered greatly from being an open profession. He might be wrong, and if so they would correct him. There was no obligation for a particular course of study, and therefore their profession might be called an open one. He thought that was a grave disadvantage, because he regarded, as he had said, the responsibility of architects as very great." Men generally believe in a great and well-organised profession, and expect great things from it, but they suspect an ill-trained and dislocated class such as the profession of architecture has hitherto been. It may also be asserted that a well-organised profession tends to produce great men.

I am anxious that what I have sought to urge in this paper should not be misunderstood to discount in the smallest degree the art qualification. This must be in any system of training the main thing, but my point is that the man who commends

himself to his *clientèle* as thoroughly qualified to guard those more practical interests which are paramount in the public mind, will, if he be also a qualified artist, have many more opportunities of producing architectural beauties than the man who, by parading his contempt for much of the work which properly appertains to building, creates distrust and even aversion in the mind which cares not for his art, but which can generally be led to understand something about it, and thus ultimately to admire it.

We London men are so apt, too, to forget country architects, who, were they not men of very general practice, could not possibly exist; and is our training and testing to be solely for the benefit of our great cities?

Our wisdom will be best shown in endeavouring to meet our clients' wishes, even when they may appear to us eccentric, prejudiced, or ignorant. Nay, may we not rather regard this as among the ethics of our calling, and as important as honestly estimating and fearlessly reporting the cost of projected work and many similar somewhat unpalatable duties? A conscientious and a thoughtful attempt to do this will generally result in unexpectedly original and beautiful features.

A practical suggestion was recently made by the *St. James's Gazette*, which I believe would result in good to architecture, and the *Daily Graphic*, noticing the remark, observed:—"Some time ago we advocated the desirability of the names of architects being placed in some prominent position on the buildings for which they are responsible."

The *St. James's Gazette* has now taken this matter up. It says, speaking of a modern building of great excellence, "While the frontage is placarded with advertisements concerning what we do not want to know, namely, who is the builder, the electric-light fitter, &c., not even a tiny tablet records the name of the artist in whom the public is most interested. If all our buildings were properly labelled, it would be a distinct gain from an educational point of view." If all architects felt that the erection of a work inevitably exposed them either to public opprobrium or esteem they would generally be much more careful of their reputation than they are at present.

There are many other essentials to successful individual practice which, when I decided early in the session to speak on this subject, I had in my mind to refer to; many of these have, however, been so ably stated by readers of other papers, particularly by the President, Mr. Beresford Pite and Mr. Collard, that I felt obliged to confine myself to the broader politics of the profession. I do not regret that circumstances have led me in this direction, as it has always appeared to me that all other professional questions sink into the background as compared to that of how best to satisfy the wants and to inspire the confidence of those who desire our advice, and if my reasons for adopting as the best means to that end the three main principles laid down in this paper, namely, (a) a prolonged systematic course of study, (b) examinations as a test and public proof of knowledge, and (c) the closing of the profession against unqualified men—if these reasons should appeal to your minds as sufficiently strong to warrant the adherence to these principles of those who are destined, as you are, to control the course of professional affairs in the near future, I shall feel that a distinct advance has been made towards the elevation of our art to its proper place in the affections of the people of this country.

Professor KERR, who spoke at considerable length, alluded to the benefit of students hearing the results of the experience of their seniors—men who had borne the heat and burden of the day. Though they might not predict what would be at the end of the twentieth century, they might speculate on what would be the character of the business in the first quarter of that century. Mr. Kerr referred to the paucity of architects when Sir William Tite was president of the Institute of Architects, and as that state of things was altered, students might rightly try to judge what their work in the future would be. Architecture consisted of three parts—art, science and practice, or business. Could they foresee what students would have to look forward to and to prepare for? He thought they could. In six years—it was but a short time—they would have the twentieth century upon them. First, in regard of practice or business. The English people gave a business-like consideration to everything they did; there was no sentimentalism; they were not like Frenchmen, who went to war for an idea. Englishmen employed an architect ninety-nine out of a hundred times to see them safely through a building transaction, no light task, and men who were distinguished artists among architects would plainly say their greatest difficulty was to carry through a building transaction creditably to all and satisfactorily to the client. Young architects must study business first and leave science and art till later. He must devote himself to the class of work in the office that seemed to be below him, and keep his ear open for all that regarded the transaction of business. As to science, he should devote himself to mathematics and calculations. Tables with calculations of scantling of timber, &c., might be used to save time, but the young architect should be able to calculate them himself. He should not forget to study chemistry, geology and the superficialities of

such sciences as he would have to deal with. In the twentieth century the public would not study whether an architect belonged to the Institute of Architects, but whether he were a practical man. Art was always a difficult question. It might be discussed for ages to come, and never be discussed too much. The English were not by gift an artistic people, unlike the Latin races, especially the French. If he ventured on a suggestion, he would say that the turn the world was taking would bring about a change in the artistic development of Europe at large, which would bring the Teutonic race to the front. If that happened the young architect must be prepared for it, and to be more artistic than at present in the way of common-sense art, that the public would look for. England, he thought, was steadily advancing in this respect. The fault of our school of art was lack of dignity. The French, the princes of architectural art in the present times, never lacked dignity. We were emerging from the dreary state of things belonging to the Gothic revival to a brighter state of things. Matters were on the move, and had advanced in the right direction. The popular style of architecture of the present day was a stepping-stone to something better. The young architect should not study *bric-à-brac*, but all examples of architecture that were really grand. England would always appreciate grandeur, repose, dignity, &c. They were embarked in a profession in which they could not become successful practitioners except by great study, diligence, perseverance, and dependence on their own intelligence.

MR. ALBERT GOODMAN proposed a vote of thanks to Mr. Seth-Smith for his paper. He thought the English would never be an artistic people, and financial questions hampered architecture.

MR. E. DORAN WEBB, following up some remarks of the last speaker, considered that an architect had better give up a client unless he could have his way and put up a building which would not do him credit, but prevent other clients employing him.

MR. T. BLASHILL said that young men going in for architecture must have a real liking for it and interest in it, then there would be no drudgery. Burke, if he remembered right, said about taste, that the shortcomings were not from want of taste, but from want of knowledge. A youth entering an office must keep himself in the closest possible touch with business. Art, science and business—he had never attached much meaning to those terms. Whatever branch of his profession the young man followed, that was his art; in other words, systematised knowledge, an intensely close and accurate knowledge of all his business; and then whatever they did in any branch of the profession was art.

MR. PAUL WATERHOUSE observed that newspapers seldom mentioned an architect's name. They gave full descriptions of buildings, and the names of every one, even the builders, but not the name of the architect.

MR. BEALE, referring to the bases of architecture described in the paper, more particularly the one dealing with the necessity of more general knowledge, described the nineteenth century as an age of specialists, and expressed his pleasure that Mr. Seth-Smith had put in a plea for the all-round man.

MR. W. RIMMINGTON expressed his opinion that the modern buildings now rising in England pointed to a strong artistic revival here, which he had failed to see abroad, and had not found in Italy, France or Germany; or, if he made an exception, he had only found it in Germany.

MR. C. H. BRODIE, in a characteristic speech of about half a minute, condemned the idea that architects should build for clients on the plan of carrying out their own views instead of their client's requirements or else refusing the work. For instance, if a client only wanted to spend 200*l.*, and an architect saw the work carried out for him for 150*l.*, that architect would succeed. That, he thought, was one base of architecture that held good in every century.

MR. F. T. W. GOLDSMITH, hon. sec., alluded to Mr. Seth-Smith being still in favour of registration, though perhaps in a modified or amended form. Mr. Goldsmith said that architects, however critical among themselves, should not go needlessly out of the way to run down each other in public. Architects should cultivate something of the social instinct that seemed to pervade other professions.

THE PRESIDENT gave his opinion that "a good time was coming." As to the training of students, London students had book knowledge and provincial students practical knowledge. Examinations, he thought, tended to keep a man in the background. A student should devote the utmost possible attention to design, and the rest would come from experience. He did not think it was necessary for a student to study minor details. Neither did he agree with Professor Kerr in his remarks on the Gothic revival. That revival had done much good. It had left its mark on our architecture which, with the Classic revival, would produce great results in the future English style. The President then put the vote to the meeting and it was carried by acclamation.

MR. SETH-SMITH replied and the meeting adjourned.

THE GREAT CLOCK OF ROUEN.

THE great clock, the pride of the people of Rouen, writes M. Reverchon, cannot perhaps claim to be the most ancient in France; that of the Palais de Justice and the great clock of Caen may justly claim to dispute with it the honour of antiquity; but it is certainly true that none other can compete with it in perfection of construction. A clock which has practically been going regularly and striking the hours and quarters for over five hundred years, may fairly be regarded as a valuable piece of mechanism, especially in this epoch when a pendulum which has been going fifty years is considered a marvel. The great clock of Rouen stands unrivalled in this respect.

Finished in September, 1389, by Jehan de Féalins, it has been running without interruption from that day to this, requiring nothing except cleaning and a few trifling repairs of its accessory parts. It was certainly not with this clock that the famous proverb originated, "This is the palace clock, which goes when it pleases." On the contrary, the great clock of Rouen had so accustomed the citizens to look upon its exactitude as a matter of course, that when, in 1572, the breaking of a wire prevented its sounding five o'clock one morning, the population was in a state of consternation. The magistrates summoned the custodian, Guillaume Petit, and remonstrated gravely with him.

¶ This unparalleled course from century to century is all the more remarkable from the fact that until 1712 the great clock had no pendulum. For 325 years it had no other regulator than a "foliot," an apparatus of which the majority of modern clockmakers hardly know the name. It consisted of a vertical rod suspended by a cord supporting a transverse beam, the arms of which terminate in a serrated edge; on their serrations are movable weights called regulators, which by change of position augment or diminish the force of inertia of the machinery. To the rod are attached two spurs which receive alternately the impulsion of the teeth of the balance wheel operated directly by the clockwork. The special characteristic of this regulator is the absence of that which constitutes the essential feature of the pendulum, namely, a natural point of inertia. It might be said of it that then it was a clock capable of regulating its regulator with a nicety determined by the degree of the precision of the cutting of the teeth of its balance-wheel.

The case of the clock occupies a space of 6 feet 8 inches long, 5 feet 4 inches broad, and 5 feet 10 inches high. When one thinks of the size and of the labour of construction by hand of the great wheels of this admirable piece of mechanism, it may easily be inferred that the maker, Jehan de Féalins, had ample time to eat up all the little sum he was paid.

The pendulum was introduced in clockwork in 1659; but so well were the good people of Rouen satisfied with the time-keeping qualities of their famous old clock, and such was their veneration for this masterpiece of mechanism, that fifty-three years were allowed to pass before the pendulum was substituted for the "foliot." Equipped with this new apparatus, it has continued to this day to strike the hours and chime the quarters.

In 1892 the Commission of Historical Monuments decided on the restoration of the dial and of the two accessory movements of the great clock, which show the days of the week and the phases of the moon.

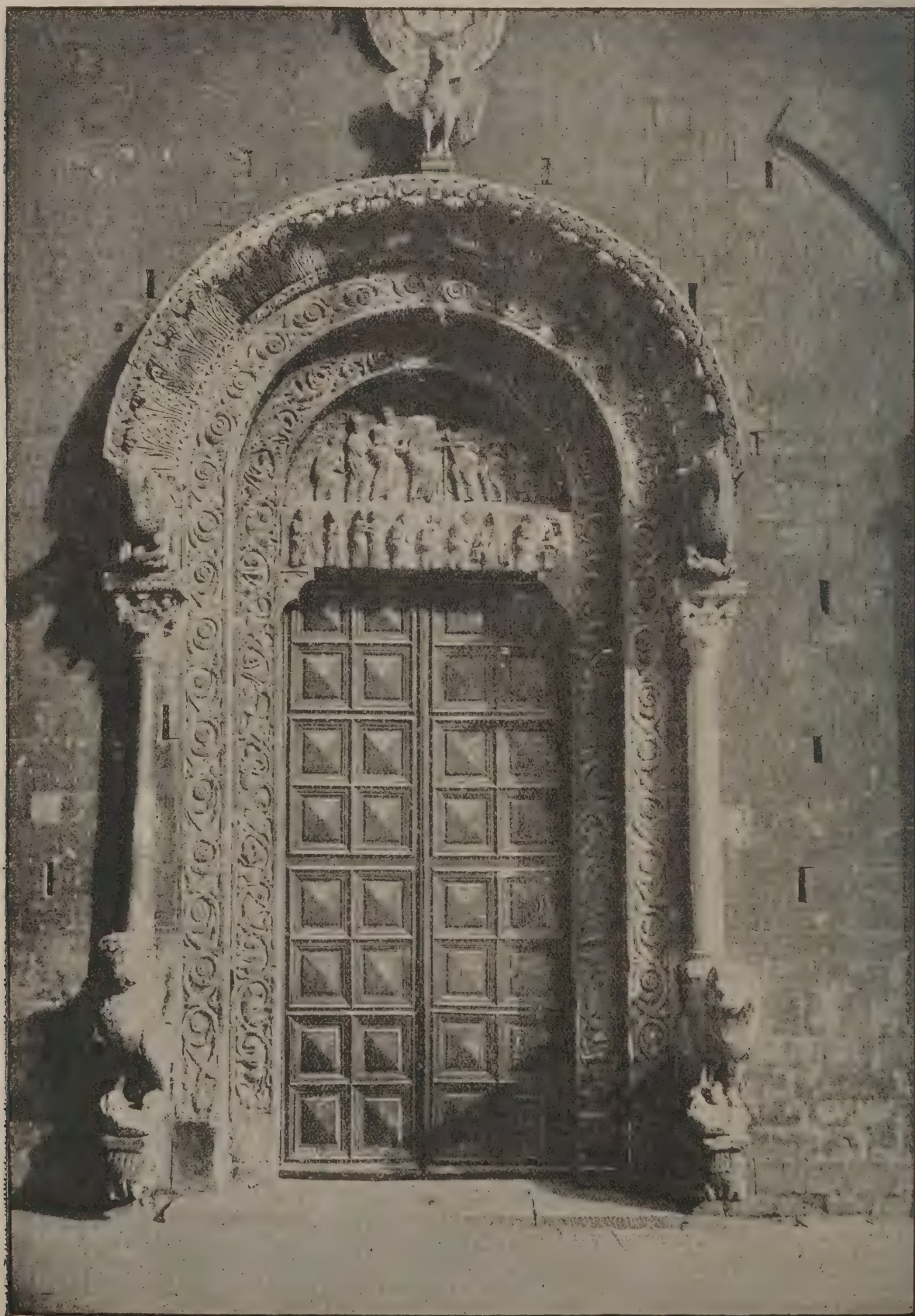
THE LATE W. HAYWOOD.

THE late engineer to the Commissioners of Sewers, Colonel William Haywood, did not long enjoy his retirement from the active duties of his office. He died on the 13th inst. in his seventy-third year. Mr. Haywood was appointed engineer to the Commission in 1846, having been previously assistant engineer, and during his forty-eight years' tenure of office he rendered many distinguished services to London. In 1851, with the late Frank Forster, who was Robert Stephenson's lieutenant at the Britannia Bridge, he prepared a scheme for diverting the sewage from the northern side of the Thames. In 1854 Sir Joseph Bazalgette and he extended the scheme, and it was eventually carried out by the Metropolitan Board of Works. In 1856 he designed and laid out the City of London Cemetery at Ilford. From 1863 to 1870 Colonel Haywood carried out that gigantic work, the Holborn Viaduct, which cost from the Coal Dues nearly four millions of money, and which was opened by Her Majesty in person on November 6, 1869. In 1879 he laid down a complete system of fire hydrants for the City, where it was first established. In 1883 he designed and erected a crematorium for burning street refuse. Earlier still, he suggested the site of the new Tower Bridge, and it is stated that during his period of service he carried out improvements in something like half the streets and places of the City at an expenditure of some millions. Among these may be mentioned the construction of Queen Victoria Street and the widening of Ludgate Hill. He was the first to lay down asphalt pavements in the carriage-ways of London.

CATHEDRAL OF BITONTO.

THE Italian Government have acted wisely in subsidising the production of photographs of buildings in districts which are outside the courses usually followed by strangers. Apulia is a region which has had a remarkable history, and evidence of the variety of rulers is to be found in the churches. The cathedral of Bari is one of the best-known examples. No less interesting is the priory of St. Nicholas, on which the Norman conquerors expended large sums of money. Bitonto, which is about ten miles from Bari, resembles in detail the church of St. Nicholas. The west door is no less rich, and figures of animals are introduced

as architectural elements. The ornament in relief nearest the door has a northern character, weird animals being employed largely. The treatment appears more remarkable from the contrast with the ornament near it, which might have been taken from a Roman building. In the lunette the figures are also of a northern type. In the upper part the subject appears to be "CHRIST amidst Saints," in the lower part the Annunciation, Visitation, Adoration of the Wise Men and Presentation in the Temple are combined. Several other photographs of the cathedral are published by Signor MOSCONI, of Rome, in his invaluable collection, which is illustrative of Italian architecture.



PRINCIPAL DOORWAY CATHEDRAL OF BITONTO APULIA

THE FREE CLASSIC REVIVAL OF 1870-80.*

I HAVE taken as the title of this lecture "Queen Anne or Free Classic Architecture." In its preparation I have kept in mind the fact that in the study of any one period of architectural history there is much that antedates that period that must be studied to clearly understand the influences that contributed to the development of the style under consideration, and which stamped an impress upon its art features and constructive forms. These influences cannot be ignored, and although in the preceding lectures you have been led onward through the various types of Pagan, Early Christian, Mediæval and Continental Renaissance, it has been with reference to their bearing upon each other and not with the view of analysing their connection with the architecture of the early part of the eighteenth century.

It is impossible in a single lecture to go over all the previous ground and investigate in an exhaustive manner the influences working upon English architecture during the two centuries preceding the reign of Queen Anne, but some slight attention must be given thereto, if only to serve as a connecting link between the older and newer styles, and to define their dependence upon each other. You will, I trust, pardon me if I briefly refer to earlier works of the great English architects, and urge you to study carefully the state of English society at the beginning of the eighteenth century, together with the material resources and limitations under which they were compelled to work. I propose also to add some notes upon the influence of the Queen Anne school upon modern work, with particular reference to the Free Classic revival of 1870.

Of all the recognised styles of architecture, the position of Queen Anne, or so-called Free Classic, is perhaps the most difficult to determine. The nomenclature will assist us but little in investigating its art history and constructive laws—the term "Queen Anne" being as much too narrow as "Free Classic" is too broad. If we ask professors of architecture and the more learned practitioners of the art for information on the subject, we meet with vague and unsatisfactory replies. Younger and more enthusiastic architects, and the devotees of spinning-wheels, blue India china, teapots and green crown glass would, during the early days of the revival, have unhesitatingly answered that Queen Anne was "high art," forgetting that art had reached its lowest ebb in England when William and Mary ascended the throne made vacant by the Stuarts.

With such diversity of sentiment and reasoning how shall we elucidate the truth? When did Queen Anne architecture originate, who were its great masters, where is its literature, what influence did it exert upon the life and manners of its early years, what causes led to its decline and to what source may we trace its sudden and aggressive renaissance?

To the student of architecture who looks beneath the surface of fashionable art culture the Queen Anne and Georgian period seems almost like a mirage, where he sees dimly reflected vistas of city streets, lined with tall houses built of red brick, tiled roofs, long and narrow sash windows painted white, and outside shutters painted green. The academies tell us that early Queen Anne was a feeble application of Palladian rules, designed for palatial works in marble to smaller edifices built of brick, and that late Queen Anne was simply a craze that has now almost run its course and is gradually sinking into oblivion as did its prototype. This lack of definite historical data is the more remarkable when we consider that Queen Anne is but of yesterday, while the records of building in general are full and copious in outline and detail.

We can follow the gradual development of styles and systems of construction and their transition into other and later styles, from the earlier hut of the Aryan Hom down through the Egyptian, Syrian, Grecian, Roman and Byzantine, through the wondrous science of the Middle Ages to the wealth and luxury of Continental Renaissance. England gradually remodelled her feudal castles into the noble and picturesque manor-houses of the Tudor kings, and the architects of Elizabeth's reign carried this somewhat fanciful but at the same time dignified type of architecture to its utmost development.

All this will be clearly and logically explained by the academies. They will further add that after the accession of the Stuarts the building art gradually declined, with only a few flashes of brilliant light in the works of Inigo Jones and Wren. The Commonwealth was prudish in art as in manners, while the Restoration was a reign of revel and wild license. Queen Anne's social world, stiff, starched and formal, left its impress upon the buildings of its day, which were mostly of a domestic character. The art of the Georgian reigns followed—more refined in sentiment, delicate but severe in outline, aristocratic, but lacking strength and boldness in composition. With the advent of the Victorian Gothicists the worn-out and debased Free Classic passed into obscurity, there to remain until the

passage by Parliament of the Elementary Education Act in 1870 brought it once more into prominence.

But for all this cursory description of an eventful period Queen Anne has a history, architectural as well as political. Her short reign witnessed the erection of a class of manor-houses and city dwellings which, gradually improving under the two succeeding monarchs, proved the basis for a revival of a remarkable character. Let us then attempt to define the position of Queen Anne architecture historically, constructively and æsthetically, and see what may be its claim to our notice as a basis for the architecture of to-day, and wherein lies the germ that may be utilised as a stepping-stone to greater excellence.

History.—The reign of Queen Anne occupied almost exactly the first twelve years of the eighteenth century (1702-14). It was immediately preceded by what some architects call the Dutch William era, which as a reign may be called the last twelve years of the seventeenth century (1689-1702). Following these came the Georgian period, which was simply a development of the preceding, and lasted with some variations, although rapidly deteriorating under the last three monarchs, until the advent of the Victorian Gothicists. Perhaps the best way to illustrate the different phases of Free Classic will be to group the reigns of William and Anne in one period of a quarter of a century, half in the seventeenth and half in the eighteenth, following the Stuart or Jacobean and preceding the Georgian.

At first sight there appears to be little promise of finding any genuine art in English work of this period. The Mediæval ecclesiastical style had died out nearly two hundred years before; during the whole of this interval the revival of Classic architecture had steadily advanced from small beginnings to a respectable position, and an academic system, so to speak, which, although it never attained in England the appreciation which led to its luxuriant development on the Continent, found expression in many works of dignity and excellence. During the reigns of Elizabeth and James I. a domestic style for manor-houses had sprung up, based upon Gothic traditions of the Tudor type, with an admixture of the Renaissance of that day. This transitional manner struggled through the Commonwealth comparatively undisturbed, losing by degrees all traces of its Mediæval origin. It maintained, however, partly by the intention of its designers, but chiefly through accident, a character of picturesqueness and homeliness.

The Great Fire of 1666 desolated two-thirds of London, destroying 13,200 houses and 89 churches, including St. Paul's Cathedral. Down to this time the architecture of London had been mostly of the timber, brick and plaster type of the Tudors. The houses were crowded closely together, covering every available piece of ground and overhanging storey above storey, until in many cases the daylight was almost excluded from the narrow courts and crooked alleys. Many of the houses were of slight materials, covered on the exterior with painted planks and on the inside with plaster.

During the reign of James I. it was enacted that the fronts of City houses should be of brick or stone. In many cases, however, a compromise was made in favour of heavy timber fronts, often richly carved and moulded, the panels being filled with bricks and plastered, the sides away from the street being still built of wood. In these houses we find many examples of the picturesque oriels and windows adopted by the designers of the Queen Anne revival.

The Fire wrought a complete change in building construction and in the health of the City. The streets and courts were widened and improved and a new class of buildings arose above the ruins. It is with these buildings that we have to do.

Immediately after the Fire a proclamation was issued by the king giving instructions for reforms in building construction. This may be called the birth of the movement which developed into the Queen Anne style as we now know it. "In the first place," writes the king, "the woeful experience in this late heavy visitation hath sufficiently convinced all men of the pernicious consequences which have attended the building with timber, and even with stone itself, the notable benefit of brick, which in so many places hath resisted and even extinguished the fire, and we do hereby declare that no man whatsoever shall presume to erect any house or building, great or small, but of brick or stone, and if any man shall do the contrary the next magistrate shall forthwith cause it to be pulled down, and such further course taken for his punishment as he deserves, and we suppose that the notable benefit many men have received from those cellars, which have been well and strongly arched, will persuade most men who build good houses to practise that good husbandry by arching all convenient places."

By an Act of the Common Council, passed on April 29, 1667, in furtherance of the king's proclamation, it is ordered, among other details, that the surveyors "do encourage and give directions to all builders, for ornament sake, that the ornaments and projections of the front buildings be of rubbed bricks, and that all the naked parts of the walls be done of

* An address by Mr. George C. Mason, jun., delivered at the Architectural School of the University of Pennsylvania, and published in *Architecture and Building*.

rough bricks neatly wrought or all rubbed at the discretion of the owner." Permission was at the same time given to enrich buildings by variety in the forms of roofs, balconies, &c.

The urgent demand for new edifices to replace those destroyed by fire and the necessity for observing strict economy in their erection precluded picturesque grouping and well-studied designs. The quaint but dangerous architecture of 1666 was rapidly replaced by rows of plain monotonous brick buildings, utterly devoid of artistic merit. In Cheapside and some of the more important thoroughfares the houses erected during this period were of a somewhat better character, taller and more elegant in design.

While improvement in the character of domestic architecture was thus hampered by economic considerations and an intricate system of land tenures, public and ecclesiastical architecture was greatly improved. The rebuilding of St. Paul's Cathedral and fifty City churches by Sir Christopher Wren marks an epoch in the history of the English Church which should not be overlooked. For the first time since the Reformation the planning and general features of church edifices were made to conform to the exigencies of the Protestant faith and a simplified ritual. Rarely has such an opportunity for distinction been vouchsafed to any architect as that which fell to the lot of Wren, and he proved himself adequate to the task. It is stated that during the last forty years of the seventeenth century no building of importance was erected in England of which he was not the architect. Had his design for a complete rebuilding of the burnt district been carried out, London would have risen from its ashes one of the most convenient and beautiful cities of the world. The edifices erected by Wren are models of their kind. A thorough constructor, he was not less an artist in his feelings, and boldly adapted the system of the Renaissance to the requirements of the time, modifying his details to meet the exigencies which arose. The Free Classic of Wren was certainly very different in conception and execution from the stiff and formal expression which we note in the works of his immediate successors, several of whom were men of marked ability. It was, moreover, immeasurably superior to the Classic attempts of the architects of the middle Georgian period, who, carried away by the enthusiasm awakened by the perusal of the "Antiquities of Athens," published 1762 by Stuart and Revett, attempted to adapt Doric porticos, hexastyle, octastyle, &c., to modern domestic architecture.

With the accession of William and Mary England and the Continent became more closely united. French, Spanish and Florentine styles of dress became the fashion, and furniture designed in Flemish and Dutch workshops succeeded the heavier examples of the preceding reigns. The opening of the china trade and the importation of Delft porcelain exerted also an influence upon the tastes of society. An affected admiration for Dutch topiary also became the fashion. It flourished for a time and reached its limit of quaint absurdity in the reign of Queen Anne. She also set the fashion of collecting old china and bric-à-brac, and court etiquette demanding a reflex of the sovereign's tastes, china collecting became a craze, rivalling the tulip mania of Holland. Architecture also felt the influences of the Dutch school; brick was by law and custom the vernacular building material of London, as of the Netherlands, and high-stepped gables with wavy lines became frequent. Broken pediments with volute terminals were placed on doors and windows, while a slight admixture of wrought and moulded bricks was often added to give some degree of elegance and richness to the façades. This use of moulded bricks had played a prominent part in Tudor works, but the legislative wisdom of Parliament placed heavy and almost prohibitory taxes upon their manufacture and also upon glass, thus vitiating popular taste by the necessity of studying strict economy in construction.

The manor-houses erected during the reigns of William and Anne and the early Georges were of a different type. Those remaining to us are bold and massive, picturesque in outline, and semi-classic in detail. In these great palaces, for many of them rise to that dignified position, of the type of Blenheim and Castle Howard, the mass of the building is generally of stone, heavy and cumbrous, and displaying little of lively imagination in their groupings and general character. Their details are carefully modelled after the rules laid down by Palladio and Vignola, and their carvings and sculpture bear the stamp of Grinling Gibbons and his pupils.

Through the later Georgian reigns and that of William IV. the taste for Free Classic continued, gradually becoming more and more debased, with a few attempts at a revival of Mediæval work as attempted by Walpole at Strawberry Hill; while in London the school of Nash and Wyatt were stuccoing the honest brickwork of their façades with poor imitations of Roman palaces, which called forth such epigrams as—

Augustus of old was for building renowned,
For of marble he left what of brick he had found.
But is not our Nash a still greater master?
He found London brick and will leave it plaster.

The earlier years of Victoria's reign were marked by aspirations for a better state of things, and discussions between the rival schools of Classicists and Mediævalists. The latter carried the day, and, after an heroic struggle, England arose from her long lethargy to find herself the possessor of a noble architecture, a true exponent of ecclesiastical art and traditions, although confessedly far from perfect when applied to domestic buildings. For these latter edifices the old manor-houses with their many mullioned windows and Tudor arcuation formed the basis for design, and machioli, turrets and open timber roofs became the fashion for country houses. City dwellings were erected in a style that was a compromise between the Georgian and semi-Gothic, the most difficult problem being the reconciliation of the double-hung sash window with the pointed arches of Mediæval precedent.

English architecture was in this transition state when Parliament in 1870 passed the Elementary Education Act. This was the initiatory movement for the revival of Queen Anne or Free Classic architecture. By this Act the formation of local school boards was ordered, which called for the erection of many buildings, city and suburban, of a class hitherto but little known. Here was the opportunity long waited for, and architects seized upon it with avidity. The natural desire was to mark the period as an architectural era; to give to the Board School buildings a character distinctively their own, simple in plan and construction, with but little display and built of the vernacular material of English cities—red brick. Moulded bricks could then be obtained in abundance, the tax on their manufacture having been removed in 1850.

(To be continued.)

EVOLUTION IN DECORATIVE ART.*

(Concluded from last week.)

I NOW propose to give some instances of the development of certain ornamental designs with a view to illustrating some of the many causes which either dictate the primary form of the design, or which affect its after developmental history, and regulate the changes undergone by it. I will first take as my examples designs whose primary motive is a representation of human or animal forms, and I include for sake of brevity, both would-be realistic and grotesque treatments of these themes. I begin with a case from savage life, in which we may see successive changes apparently due to the individual tastes of the artists, though it is probable that there may have been the very usual utilitarian value for the variations as marks of ownership, as where the objects, spears in this case, were very similar, they could be individually recognised by their ornament. The patterns which I show are carved upon the shafts of spears from the Solomon Islands, always at about the same place.

In the first we can recognise a little grotesque human figure with very large angular mouth. In the second we see that while the body and limbs are vanishing away, this prominent mouth is reduplicated. The third shows three chevron-like mouths and but scanty remains of body and limbs. In the last example the "mouths" have completely gained the day, and form a series of chevrons, with a corresponding number turned the other way for symmetry. A few lines only at the base represent the last struggling remnants of the lower parts of the body. Although I do not pretend that these patterns are strictly consecutive, there can be little doubt that they are closely related and that the order of their appearance has been as described, the more realistic preceding the more conventional.

In the same group of islands one may see designs representing the frigate bird in all stages between very fair realism and complete conventionalism. The stages which are midway between the realistic and the fanciful are interesting, as, while the prototype of the design may still be recognised, one may at the same time see to some extent the direction whither it is tending in its passage towards a purely meaningless pattern whose resemblance to a natural object has entirely ceased.

I give an example from West Africa of two little carved wooden human fetish figures with long horns, the one showing body and limbs complete, the left hand holding the bowl of a pipe which is being smoked, and the other figure showing the same design in a more conventional form, the body and limbs fused into a mass below and the pipe hanging centrally between the mouth, or rather chin, and this body mass.

The human form in its treatment for decorative purposes undergoes marvellous vicissitudes, and affords, perhaps, the most striking instances of the effect of successive copying when the object is to create slight variations, often in order to produce a greater ornamental effect. When we look at the marvellously intricate scrolled patterns, carved with great skill by the Maories of New Zealand, we can see that there is a general relationship in their character, and if we take a

* A paper by Mr. Henry Balfour, M.A., read before the Applied Art Section of the Society of Arts.

sufficient number of examples, and classify them carefully so as to form more or less consecutive series, we can see that in nearly all cases the pattern of the scroll-work, however intricate and fanciful, is referable to one primary theme—a representation of the human form. Sometimes it is the face only, the beautifully tattooed lines of which readily lend themselves for transference as ornamental effects to materials such as wood-work; in other cases the body and limbs have also been brought into the design, and may still be recognised in the less fanciful examples. In the very conventionalised examples the nature of the primary conception can only be interpreted by an examination of other allied designs which have retained something of the original form.

Often enough, instead of an amplification of a design, or the retention of its more decorative elements, we see a process of degradation in the history of a design. The parts gradually drop out—it may be through careless representation or it may be through accident—and disappear one by one till there is no trace left. One notices the effects of degradation processes in the well-known “face vases” of Mykenar, in which the last remnants of what once represented a female head and bust are too little dabs representing the breasts, with no context to explain their origin, which can only be discovered by examining a number of examples of earlier date.

In the case of some ornamental designs there is a definite reason for creating variations. The case of the Japanese family crests, for example, supplies us with excellent instances of necessary variation from the original form of the crest, as new branches have arisen of the family, each demanding a fresh variation upon the emblem of the original family stem. The new design must be closely allied to the original, but must be sufficiently distinctive to denote a particular family branch. The crane, which, as emblem of longevity, appears in realistic form so frequently in Japanese art, is the original subject of one series of family crests, and becomes by successive modifications a kind of floral calyx upon a stem. The axe is another token, so to speak, and in some of the variations upon this theme we see a number of axes arranged around a centre and forming a kind of rosette; the handles in some cases nearly or quite disappear, and it is difficult to recognise an axe form at all in the later modifications. So, too, we may see floral designs derived from butterflies, and so on in endless variety.

The tendency for the more important portion of a symbolic design to persist, while the rest may disappear, has its curious illustrative instances, of which I give one. A common design in Maori art is one representing a face, with a tongue enormously protruded. This protruded tongue is symbolic, and is intended to convey the expression of defiance to an enemy. Hence the tongue is the most important feature represented, and it is essential that this should remain intact, though it matters less what becomes of the other features of the face. This minor importance of the rest of the face is exemplified in the three figures representing this design upon the tops of Maori ceremonial staves. In the first, a grotesque full face is seen, with the tongue of huge size and duly protruded. The second is seen to have the face in profile, though the tongue remains full face, this showing how little the eyes and nose and mouth are concerned in the symbolism of the design. The third example shows the complete suppression of face, while the tongue remains unchanged, and conveys its meaning just as well as ever to one who knows the origin of the design. So it is with other symbolic designs, which, although they have a definite and important meaning to convey, are liable to extensive variation; but while the parts of lesser importance may disappear early, the more strictly symbolic portions are usually the last to become modified, and these tend to persist, in spite of the disappearance of their context.

A constantly occurring cause of variation is the influence of one design over another. It is a matter of difficulty to discern the extent to which this takes place, but in some cases it is very obvious, especially so where two or more designs of different nature are subject to constant repetition in close proximity. Thus Haddon,* in describing the very elaborate dancing-masks of tortoiseshell made and used by the Torres Straits islanders, mentions that some of these are in the form of crocodiles, while others represent the shark. The influence of this latter design over the former seems to appear in the presence of lines representing gills upon the crocodile figures. Now, gills are in no way legitimate attributes of crocodiles, and one must suppose them to have been borrowed from the shark designs, in which they have a true morphological value. I must be content with giving this single instance of a very common factor in creating variation from the normal in designs.

The nature of the material is apt to dictate the form under which a design may appear, and the artist may be compelled to depart from anything like realistic representation by reason of the limitations imposed by the kind of material in which he is working. In textile art this is especially apparent; in the coarser form of textiles it is impossible to represent curves, and

it is in the finer forms alone that they can be represented with any degree of accuracy. This is very apparent in basket-work, and it is interesting, in the case of patterns or designs whose meaning we can recognise, to see how far their form is due to the essential structure of the fabric. The rectangularity which, perforce, must take the place of the curves which are often intended, is especially striking in designs whose motive is a representation either of animals or the human form. However desirous the artist may be to produce true resemblances, a grotesqueness of treatment is imposed by the nature and coarseness of the textile. In the decorative designs found on the basket-work of the natives of British Guiana, animal forms may often be seen—birds, frogs, monkeys, snakes, &c. The coils of a snake become a kind of a meander or Greek fret pattern, the curves being all squared. In some snake designs from British Guiana, the tails of the snakes being confluent, a nearly complete continuous meander is formed round the basket, broken only where the two heads of the snakes are represented. In other cases the heads are omitted and an unbroken fret pattern is formed, running continuously all round. That actual representation should readily give place to fanciful patterns is only natural where the best efforts at producing realistic figures can but result in the grotesque at the outset. Designs woven in cloth, carpets, tapestries, &c., show the same limitations in varying degree. Those of fine texture only admit of curved and scrolled designs of such exquisite beauty as some of those described and figured by Mr. Paul Schultze in a paper read last year before this Society.

I now wish to leave the consideration of designs whose primary motive is portraiture, and especially the representations of the human and animal form, in order that I may be able to give a few instances of ornamental designs whose actual origin as such is to be accounted for, which have, in fact, a definite *raison d'être* in the form in which they occur, as a reminiscence of their antecedents.

Where the circumstances have changed, we may frequently learn something of the earlier condition of objects by means of an examination of the form of decoration exhibited by them, and ornament thus becomes a useful clue in studying the developmental changes undergone by various objects. It is a common thing to see as a decoration upon vessels of clay a band of rope-like appearance running round the vessel towards the upper part. Now, in cases where clay of a poor quality has been used there has often been the custom of using plaited or twisted bindings in order to preserve the shape of the vessel before baking, and to prevent its collapsing. These bands would leave an impression upon the soft clay, which would be perpetuated in the baked vessel; and no doubt the rope-like bands of ornament, such as we see in the Zûni urn, were suggested as a form of decoration by the actual bands formerly used, or their imprints in other vessels. Such bands are frequently to be seen adorning, and seemingly giving support to, the coarse pottery urns of the ancient British times.

Where the material used in the manufacture of objects of use has been changed, the form imposed by the earlier material is frequently recalled in the decoration of the new material. To take an example: the natives of the Andaman Islands were, as they still are to some extent, in the habit of using the large shells of the bivalve pinna as plates for food; these are broad and rounded at one end, and pointed at the other. They have now largely substituted dishes made of wood for these shells, and these wooden dishes are pointed at both ends, but in some the shape of the shell is suggested by the presence of a curved line in wax at one end, which seems, as it were, to cut off the pointed end beyond it, and to give the shape of the shell prototype. There can be no other reason for this curved line at one end. Another example may be seen in the little “apple-gougues” still to be seen in use in the country, made from the shank-bone of a sheep, partly cut away to form a long narrow gouge-like blade, and with a handle formed by the natural articular condyles of the bone. Some of these instruments are made of wood, instead of the natural bones, but, though these may be more elaborate in make and decoration, they nevertheless, in their general shape, simulate the bone shape, and the two articular condyles appear as an ornamental shaping of the handle end.

In cases where an object of use has for various reasons changed its structure somewhat, while retaining its general shape or appearance, we may sometimes see instances of decoration which have been suggested by former details of structure which have been suppressed on the new forms. Thus, there is the case of some air-guns, with which some time ago an Austrian regiment was armed, in the place of the more usual firearm of the period. These being air-guns no longer required to be fitted with an external lock and lock-plate, but the absence of the latter seems to have been regarded as detrimental to the appearance of the weapon, and we find the outline of a lock-plate engraved upon the breech end of the gun at the point where the actual plate would have been had the propulsive agent been gunpowder. I am not sure that some of our modern “hammerless” guns do not show some-

* *Internat. Arch. f. Ethnographie*, vi. p. 146.

what kindred external ornamentation. A very similar case of "survival" in ornament is seen in some well-known Greek and Etruscan helmets, in the early forms of which we see a space between the cheek-pieces communicating above with the two eye-holes, which are separated by the bar protecting the nose. Modern tailors perpetuate the memory of what was once a useful appendage to a coat, when they add as finishing touches the two buttons which we see upon men's coats in the region of the small of the back, and the shape of the coat collar and flaps is often only suggestive of a possibility of buttoning the latter across the chest when desired, as the shape is just sufficiently modified to prevent this being actually done, the button-hole being solaced for the loss of the button with which in former times it would have been mated by being made the recipient of the small bunch of flowers which adopts the name of its holder.

I will now conclude with an example of a form of decoration which owes its origin accidentally to a process in the manufacture of the objects which it adorns. The natives of the Solomon Islands, from whose art I have already drawn more than one example, make their long arrows with shafts of bamboo. The roughness of the nodes upon the bamboo proving inconvenient in shooting, these are usually pared down so as to render the whole shaft smooth. The fibrous structure of the bamboo causes a liability for narrow strips to peel away when started by a cut, and we see arrows in which numerous narrow lines of varying length are grouped round the node caused by this accidental stripping. In the course of the use of such an arrow the stripped portions become darkened, as they readily take up any dirt or other colouring matter, whereas the smooth siliceous exterior remains clean. These darkened groups of long and short lines were evidently accepted as a suggestion for decoration, as we see that they have been copied with a more careful regulation of length of the lines, which are grouped in graduated series and purposely darkened with black pigment. The paring of the node is performed by a separate process, with greater care to prevent peeling as before, in order not to encroach upon the derived ornament. Next came an increase in the number of the groups of lines, which are now often produced by scraping and not peeling. At a later stage the lines are finely incised, the number of groups increased, so that their bases become fused. Later still, the groups are more completely fused, their apices alone being separate; and lastly we get complete fusion, the lines, all now of equal length, forming a complete band round the shaft, just above the node. This band appears under a great many varieties, in accordance with the varying tastes of the artists.*

In bringing to a close this very brief and imperfect survey of a wide subject, I will only add that although I have, in order to avoid possible complexity, selected for my illustrations of the various developmental processes examples taken for the most part from the art of the lower races of mankind, the same processes may be seen at work in the art of the most highly civilised people with much the same results, and we have only to study with a little care the examples of decorative art which everywhere surround us, and are always at hand, to discern traces of a developmental history which is often as startling and curious as it is interesting and instructive.

HOSPITAL CONSTRUCTION.

A MEETING of the Leeds and Yorkshire Architectural Society was held on Monday evening in the Law Institute, Albion Place, when Mr. W. Henman read a paper on "Hospitals." He said that much information was available on the subject, but future scientific investigation would no doubt demand the relinquishing of opinions now held and the substitution of others. To gain a proper knowledge of the subject they must ascertain what failures there had been, and seek out the defects of the existing buildings. He strongly advised such personal examination, as well as inquiry of doctors and nurses, as to good and bad points. The public demanded that the external aspect, as well as the inside, should receive attention. They had to secure the health and happiness of the patients and staff, and also an artistic exterior. Mr. Henman referred to the two systems of artificial ventilation in use—air taken out by suction, and air forced into a room. He explained the ventilation of the hospital at Birmingham now being constructed from his plans. There the air, warmed, freed from dust and insect life, will be sent into the ward and extracted by means of a fan. Ventilation of a similar character is in use, he said, at the Victoria Infirmary at Glasgow, and it works exceedingly well. In hospitals it was desirable that the air should not circulate from ward to ward, and for this the system provided. A vote of thanks was accorded to Mr. Henman.

* This series was originally published, with a plate, in the *Journal of the Anthropological Society*, xvii. p. 328.



Tendering in Aberdeen.

SIR,—In your issue (early in January of this year) you published a list of the tenders which had been received for the Broomhill School (under the Aberdeen School Board) and the names of the successful offerers.

If you will kindly refer to the list of offerers for iron-work, you will note that the offer of our firm, although the lowest, was not accepted. Being quite unaware of any reason why we should thus be passed by, our law agents wrote to the Clerk of the School Board asking the reason, but failed to get any explanation.

The School Board election here is now coming on, and we send you by this post a copy of the *Aberdeen Free Press* giving a report of an election meeting at which Mr. James Smith, one of the members of the present Board, gives an explanation of the reason why our offer was not accepted, and at same time states that after investigation he found there was no ground for the defamatory statement which had been given to him as the reason for not accepting our offer.

As the publication of this action of the School Board in your paper caused us considerable loss and damage in reputation, we shall esteem it a favour if you will be good enough to insert some explanatory statement from the paper we send you. Thanking you in anticipation, we are, yours faithfully,

BLAIKIE BROS., Ltd.
(C. Wilson, Sec.).

Aberdeen: April 14.

[We are not responsible for the decisions of Local Boards, School Boards, County Councils, &c., though we have to record them. It should be well known by this time that frequently advertisements are sent to the press as a mere matter of form, and therefore it is not known that those advertising have already selected their man to whom they have decided to give the job or the appointment. As to the merits of the above, we express no opinion till we have further looked over the evidence.—ED.]

GENERAL.

Mr. George Simpson has been recommended as the new burgh assessor, architect and practical adviser to the Leith Town Council, but he is not to conduct a private business, unless as a valuator of private property. The salary will be 350*l*.

The Architects who have been elected to serve as jurors for the forthcoming Salon exhibition are MM. Daumet, Coquart, Ginain, Vaudremer, Pascal, Guadet, Mayeux, Laloux, Loviot, Garnier, Raulin and Corroyer, with MM. Esquié and Deslignières as supplementary jurors.

The Bella Houston Trustees have offered to the Court of the University of Glasgow a grant of 5,000*l*. towards the erection and equipment of buildings at Queen Margaret College for the medical and scientific instruction of the students, provided the Court is willing to undertake the pecuniary responsibility of erecting the buildings in question.

Mr. C. C. Doig, architect, Elgin, has patented an invention for the prevention of fire from explosions in malt mills. It consists of a specially made conveyor set in a suitable position underneath the cylinders of the mill, and having the blade of the spiral cut at such a point that, whether the mill is running full or empty, there will always be a seat between it and the elevator or hopper, thus localising and extinguishing any slight explosion that could possibly occur to its seat.

The Great Bell offered by the citizens of Moscow to the Parisians, which will weigh 80,000 kilos, or nearly eighty tons, is to be placed in the new church of the Sacré Cœur, Montmartre. It was too heavy to be used at Notre Dame.

The Burns Statue in Ayr will soon be complete, two of the four panels having been placed in position. One is the gift of the sculptor, Mr. Lawson, and represents the ride of Tam o' Shanter; the other is the gift of Mr. Birkmyre, M.P., and represents a scene in the "Cottar's Saturday Night." The third panel has been subscribed for by the Freemasons of Scotland, and it is probable that the fourth will be the gift of the Ayr Burns Club.

A Series of Illustrations by Mr. H. P. Burke-Downing, of the principal abbeys and minsters of England, has been commenced in the new magazine *St. Paul's*.

Professor A. W. B. Kennedy, President of the Institution of Mechanical Engineers, presided at the annual dinner of that body, held at the Freemasons' Tavern.

The Liverpool City Council have decided to invite the British Association to hold their annual congress for 1896 in Liverpool.

The Architect.

THE WEEK.

THE competition among sixty-one architects for a school in Fulham Palace Road to accommodate 1,200 children, and that could be enlarged to accommodate 1,600 children, which was decided at the end of last year, was not quite so satisfactory as was expected. General MOBERLY, the chairman of the works committee of the London School Board, and Mr. HUGGETT, have declared that, "after a careful examination of the premiated designs, there is not, so far as we are able to see, any new feature, educational or otherwise, in any one of these designs;" "that the adoption of the designs would not effect any reduction in the cost of such schools and buildings;" and that "there are certain features in the elevation of this school, such as the multiplication of gables, which would tend to increase the initial cost of building, and would materially increase the cost of subsequent repairs, besides having the effect, in the case of the windows, of somewhat interfering with the efficient lighting of the school, inasmuch as the corners of some of the rooms would be indifferently lighted, and the windows themselves contain very small panes in accordance with the style of architecture adopted." If one of the plans were carried out the commission to the architect would be 5 per cent., while the architect's department can carry out building at a cost of about 3 per cent. on the outlay. That saving is, however, so insignificant if compared with the outlay on other experiments, we are surprised it was mentioned. The competition cost the Board 552*l.* 14*s.* 10*d.*, the principal items being the three premiums amounting to 300*l.*, and the assessor's fee of 200*l.*, and as in the opinion of the committee the only gain from the outlay was the gratification of discovering that the Board's plans are not to be surpassed, the chairman of the works committee proposes that the authors of the three premiated designs be informed that the Board do not propose to take any further action in the matter. One of the members of the Board will propose as an amendment that Messrs. MITCHELL & BUTLER, Messrs. CRICKMAY & SONS, and Messrs. LEEMING & LEEMING should each be instructed to prepare plans and specifications for a school on the lines of their design, but that in the event of the tenders exceeding their estimates, the engagement shall be cancelled without the Board incurring any liability. The conditions of the amendment cannot be considered as too generous, but if the three firms will accept them they ought to have a chance. The criticism on the designs would enable the architects to remove defects, and it is possible that three efficient schools would be erected. For the sake of saving 2 per cent. on the outlay the London School Board should not leave an experiment incomplete.

THE cases which turn on questions of efficient drainage in houses have become so numerous, we may soon expect that the least suspicious lady will realise the necessity of obtaining a guarantee of the sanitary arrangements before taking a house. On Monday Mr. Justice ROMER tried an action, TOFIELD *v.* ROBERTS, plaintiff and defendant being ladies, which was a revelation of the diffusion of knowledge concerning law. The defendant was eager to obtain a house in the West-end for her daughter, who was about to be married to a Captain SOMERSET. The plaintiff was willing to dispose of the lease of a house which suited. In a letter to the house agent, Mrs. TOFIELD said, "I can give assurance that the drains are satisfactory, as I had them looked at a year ago, when certain alterations were made, and all that was necessary was done." The defendant did not appear to have accepted the assurance as sufficient, for she had the drains examined. Then a promise was given to buy the interest in the lease, and a deposit was paid. Captain SOMERSET wished to have electric light in the house, and although no contract was entered into by him, the electricians commenced operations. Occasional visits to the empty house did not convince the defendant that the drains were innocuous. There was a new examination ordered, and their defects were manifested. The

defendant accordingly declined to carry out the agreement, on the ground that there was misrepresentation, and the action was taken to compel her to purchase the lease. There were two points in the plaintiff's favour—first, the want of confidence shown by the defendant, who, after receiving an assurance about the drains, ordered an examination of them, thus suggesting that it was understood there was no absolute guarantee. The second was the starting of operations for the electric lighting, which might be taken as part performance of the agreement between the parties. Mr. Justice ROMER would probably have given judgment for the plaintiff on the latter point if a contract had been entered into for the work. But in the absence of such a document, there was nothing to connect the plaintiff with the operations. The suspicion about the drains was not interpreted by the judge as the entire absence of reliance on the assurance; besides, it was confirmed by a statement of the agent's about the condition of the drains. The plaintiff therefore lost her action. It must be said, however, that very little would have sufficed to have brought about an opposite result.

THE recent depression in business was not without effect on the finances of the Art Union of London. The report which was read at the meeting on Wednesday states:—"The serious financial crisis in the Australian colonies produced a marked effect upon the returns of members furnished to the Society last year. The great coal strike has had a similar effect in many of the northern and midland districts of England upon the amount of support extended to the Society, and therefore it is gratifying to the Council to be able to announce an increase in the subscriptions for the year now closing, and a considerable accession of new members to its ranks." The Marquis of LOTHIAN has been elected successor to the late Earl of DERBY, and under the new presidency the Art Union may be able to advance at a better rate than was witnessed recently.

THE exhibition in the Champ de Mars contains this year eleven works by the president, M. PUVIS DE CHAVANNES. They form part of the decoration of the Hôtel de Ville, Paris. The largest will be *Victor Hugo Offering his Homage to the City of Paris*, which it must be admitted has disappointed the admirers of the artist, although it may appear less odd when attached to the ceiling of a staircase. For the six tympanums the artist has selected the following subjects, viz. *Beauty, Fancy, L'Esprit, Remembrance, Urbanity and Intrepidity*. The subjects for the voussours are *Patriotism, Charity, Enthusiasm for Art and Intellect*.

THE inquiry before Mr. P. E. PILDITCH into the claim made by Mr. NIGHTINGALE against the London, Liverpool and Globe Insurance Company has been concluded, after occupying eight days. The case related to the reinstatement after a fire of a large grain warehouse at Rotherhithe, and occupied by Mr. GORDON COMBE. The builder's claim amounted in the aggregate to about 8,000*l.* Among the witnesses were Mr. A. R. STENNING, Mr. TAVENOR PERRY, Mr. NIGHTINGALE, Mr. FRASER, Mr. RICHARD MORLAND, C.E., Mr. G. WAILES, Mr. SIDNEY YOUNG, Mr. JOSEPH OAKE, Mr. W. A. REES and Mr. F. W. PORTER. The amount awarded was about 1,200*l.* in addition to a sum of over 3,000*l.* received on account.

MESSRS. HOMAN & RODGERS have had an ivory set-square prepared for the use of their customers. The material is well adapted for the purpose, for it is smooth and cleanly. The square has the additional advantage of furnishing the safe loads for steel joists, varying from 5½ to 19¾ inches in depth. The information is constantly required in architects' offices, but too often it is not easy to discover where it is to be found. Messrs. HOMAN & RODGERS supply it in a form that will always be at hand. The square is therefore useful, as well as a luxurious addition to drawing instruments.

DEFYING AUGURY.

THE laws against fortune-telling and the general aversion to gipsies who are associated with palmistry have not eradicated the belief in divination. Although the age is supposed to be scientific, and in consequence takes nothing on trust, yet there is evidence enough that hard-headed people, in spite of all their respect for logic, have a lurking faith that the mysterious laws prescribed by fate respecting individuals are to be discovered. Professors of phrenology, sages who can read the lines inscribed on the hands or the feet, interpreters of handwriting and others of the same class, manage to inspire as much confidence as if in conducting their researches they observed the Methods of Agreement and Difference, of Residues and Concomitant Variations. There must be something inherent in human nature which finds gratification in every sort of revelation about so mysterious a being as man himself, and in anything which is supposed to afford a clue to his nature and its capabilities for good or evil.

All professors of the kind are, however, liable to be treated as charlatans so long as they confine their attention to individuals. But if while acting in precisely the same spirit they attempt to tell the fortunes of nations under the guise of the philosophy of history or some sounding designation of the sort, they may with some confidence lay claim to the respect of their contemporaries and the reverence of posterity. Their predictions may not be more certain than those which gipsy women unfold on a race-course, but so long as people are flattered by them the end of the seers is attained.

At the present season the recollection of some of those predictions must arise, for it is a remarkable fact that every exhibition of the Royal Academy, as well as of other societies, or even one of rejected pictures, is evidence of the baselessness of the laws which philosophers have affirmed to be preordained for the government of the world. If those keen-eyed men were right, a Briton is incompetent to paint a picture or to produce a work of art of any class, and his efforts are a sort of rebellion against the system of the world.

According to Mr. FERGUSSON, "wherever the Aryans appear, art flies before them," and he gets over the instances in which art was less fearful, or was not furnished with wings, by ascribing them to accidents, as when he says, "Had there been no Pelasgi in Greece, there probably would have been no architecture of the Grecian period." As he arranges the inhabitants of the world, past, present and to come, in only three or four groups, they resemble generalities, and the people of one country cannot be elevated at the expense of others. His conclusions are like the fortune-teller's declarations about the enemy or rival that is to appear at some indefinite time, but is not necessarily the BROWN, JONES or ROBINSON who is detected at the moment by the seeker after knowledge. The Aryans are a tolerably numerous family, and Britons have no right to assume that Mr. FERGUSSON was jibing them alone when they occasionally assumed they were creating works of art while engaged in a slovenly process of copying.

The philosophers of the last century, on the contrary, were precise, and pointed to the inhabitants of the British Isles as affording an unquestionable proof of the wisdom of Providence or nature in depriving people of capacities that would be useless to them. MONTESQUIEU was one of those wise men. He came over to England in Lord CHESTERFIELD's yacht in order to study the people and test the accuracy of his conclusions about their peculiarities. He was presented to GEORGE II., the Queen and Prince, at Kensington. For his sake the conversation took a literary turn. He heard Queen WILHELMINA CAROLINA ask Lord CHESTERFIELD why all SHAKESPEARE's women were stupid, and, as a further display of her ability, Her Majesty condescended to ask MONTESQUIEU whether in France CORNEILLE was not preferred to RACINE. In his pursuit of knowledge MONTESQUIEU did not hesitate to drive through the streets of London, although he knew it was necessary for a man to make his will before he entered a hackney coach. He endured much, but at least he witnessed remarkable scenes, which he turned to account, such as the slaters reading their newspapers on the roofs of houses, and the stout member in the House of Commons declaring again and again that in England there was no

need of troops, and that he did not care to be governed by Hanoverian maxims. But all the eccentricities, as well as the peculiar virtues, he charged against the climate. In England it gave rise to a malady which was persistent, and made the inhabitants disgusted with life. Every one was afflicted, and as they found some little relief in abusing the climate, as well as all things created, it was necessary that there should be freedom to speak as one pleased and do as one liked, even to the extent of committing suicide. There was no sacrifice which the Briton was not ready to make to secure that relief. Sometimes his patience was exhausted, and to escape from the climate he went to some distant part of the world and founded a colony. There might be less oppressive air in the new region, but habit asserted its strength, and the emigrant was unaltered. England was, however, to be watched by all its neighbours, for men who lived always in so unenviable a state would be glad of opportunities to gain excitement. Hence the people were feared by others. The heaviness of the climate was not without effect on luxury. Everything ministered to pride; there was no demand for anything that was light or frivolous. There was bitterness in the works of literature, and owing to the extent of corruption many English JUVENALS were to be found for one HORACE. The poets, being deprived of taste, were rude rather than delicate. The works of art displayed something which approached the force of MICHEL ANGELO rather than the grace of RAPHAEL. The people were so dense no wit could penetrate to their sensibility, for MONTESQUIEU records as if he were not satisfied that the only effect of his book was to make the English give orders for the wine he produced in his vineyards at La Brède, in the Bordeaux district.

In truth it was easier to treat the author as a shrewd man who wished to advertise himself and his claret than to reply to his arguments. Once admit that the climate of England is so depressing that the finer qualities of the mind have no chance of exercise, and it must follow that art and literature cannot thrive in England. MONTESQUIEU was a lawyer, a judge, a president of a French Parliament, and in his book he displays his practised skill as a dialectician. To give more effect to his reasoning he adopts a method that is almost as impersonal as EUCLID's. He does not always refer to a country by name; he prefers to say, in the case of England, Let us suppose an island exists in the northern seas with certain defects, inhabited by people with certain qualities, and so on, what kind of character and what events will follow? One conclusion comes after another until it appears to be unquestionable that the English must be a stupid race, who succeeded after an immense expenditure of blood in being governed by a stupid king who had a stupid son ready to succeed him. He relates how at a masquerade Lady DENHAM asked GEORGE II. what had become of the Prince of WALES, and if they were afraid to let him be seen, and was he to become "aussi sot que son père et son grand-père?" Princes, courtiers and people were alike afflicted. It was this rigorous reasoning of MONTESQUIEU which seemed to oppress JAMES BARRY, the Royal Academician, when he endeavoured to explain that there was no necessity to be desponding about the future of art in England, because of the degree of latitude which marked the position of the island. He acknowledges that MONTESQUIEU was unlike the other critics who saw no hope for England, and it was his power which deceived him. This is evident when we find BARRY saying, "Sometimes these eagles of philosophy will soar so high that they see nothing but clouds. A mere ordinary man would have found out, nay, had it been in the islands of Borneo or Madagascar, MONTESQUIEU would have found that this hateful practice of suicide was brought about by a combination of moral causes; that it was of very recent introduction, and that the natives formerly were not particularly remarkable for this moroseness of disposition and this *tædium vite*." BARRY's fastening on what was said by the Frenchman about suicide, which is only referred to as an occasional consequence of the miserable weather, suggests the difficulty of dealing with MONTESQUIEU's conclusions. Whether it is a philosopher, a fortune-teller, or Mr. FERGUSSON who attempts to predicate about Fate, a plain man is sure to be puzzled in replying.

WINCKELMANN was more impartial than MONTESQUIEU, for he believed that the entire north of Europe, including

Germany, was subjected by nature to restrictions which only an occasional genius could surmount. According to him, the influence of climate on the mode of thought of a people is just as perceptible as the influence of the same cause on their conformation. The Britons were, in consequence, sober-minded, and their reason predominated over their imagination. Even their poets could not suggest pictures. MILTON'S scenes, which are astonishing but fearful, are not fitted to be painted. With the exception of one scene in Eden they are all like Gorgons and all alike terrible. Whether the scarcity of painters among the English—for they could not refer to a single one who attained celebrity—did not also proceed from the climate, WINCKELMANN said he left to others to determine. Apparently he considered the subject was too trivial to occupy his attention.

The versatile Abbé Du Bos in the early part of the eighteenth century was the lawgiver on art in Paris. He was willing to admit that England produced excellent poets and musicians, as well as followers of science. But his list of the painters contained only three names, viz. COOPER, HUDSON and RILEY. The cause was the unlucky climate. The peoples among whom the arts have not flourished, he said, are those who inhabit climates which are unsuited to the arts; everywhere else they appear of their own accord, or can be introduced by the aid of commerce. Du Bos demonstrated that for two centuries at least before his time the English were lovers of pictures. A foreign artist could gain among them three times as much as with patrons elsewhere. HENRY VIII. treated HOLBEIN royally. Queen ELIZABETH for nearly fifty years was munificent in her dealings for *vertus* of all sorts. The enthusiasm of CHARLES I., and his ambition to outbid PHILIP IV. of Spain, raised the market prices of Old Masters throughout Europe. But in spite of the prodigality in spending money, not one Englishman arose who was qualified to be ranked among second-class artists; the three portraitists above-named represented native ability. Du Bos explains how the HOLBEINS, LELY and KNELLER came from Germany, VANDYKE from Flanders, VERRIO from Naples. The money and medals, as well as sculpture, were also the works of strangers. There were no better workmen than the English, but they were forced to depend on foreign workmen to supply designs. Du Bos considered there was one law for vegetation and painters. There were plants which could not grow outside the prescribed habitat, and however enormous the sums might be which were available to be expended on works of art, they were insufficient to create artists in lands which were humid or torrid. The characters of men corresponded with the climates in which they were nurtured, and as long as England was cold and damp there was no chance of possessing native painters: the patrons of art would have to rely on foreigners for gratification.

A theory which was so plausible could not fail to be accepted in France and it is not altogether exploded. The amazement expressed by the French artists and critics when they saw English pictures in international exhibitions in Paris was a proof of the conviction that England was not destined to be a mother of the arts. EDMOND ABOUT, for instance, could not help admitting that in 1855 there were capital paintings in the English section, but he consoled himself by denying there was any sign of genius in the collection. Unlike MONTESQUIEU, he was able to see evidence of *d'esprit* on all sides, and he prophesied that it would become from its profusion the ruin of the art. To the Frenchman the English school is a sort of baseless fabric, an exhalation which at one time does not appear to exist, and at another time and afterwards assumes the appearance of the most enduring stability. They are not to be deceived, however, and in the Louvre the English paintings are therefore remarkably few.

As we have said, it is not easy to argue with those who profess to have exceptional vision, which can pierce obstacles and read the future with as much ease as a novel. There is, however, one way of dealing with them. It is a puzzling process to prove the possibility of motion, for a thing cannot be in two places at once, but practically it can be demonstrated, *solvitur ambulando*. In the same way we can admit that in theory neither Englishmen nor Aryans have any authority from nature to meddle with art, and their efforts are like the planting of barren slips doomed to

failure. As Mr. FERGUSON asserts, want of faith will prevent the Aryans from attaining more excellence in architectural art hereafter than they have done in the past; they are singularly deficient in their appreciation of colours and the harmony of tints is unknown to them, while "an ideal statue or ideal painting may be a pretty Celtic plaything, but it is not what Aryans hanker after." The deductions from the laws of race as well as of climate therefore appear to be against the endeavours of the Aryans to become artists. But as HAMLET said, "We defy augury." If art fled before the Aryans it was easily captured and made subservient like other forces, and we may expect that in the future it will also minister to their needs. The productions may not be comparable to such Turanian examples as the tombs of ancestors in China or the cave temples of India. But in spite of their shortcomings beside those works which have the sanction of nature, they have character enough to inspire the hope that in spite of Mr. FERGUSON and the French philosophers, art in Britain, as in Germany and America may yet attain a level which will not be much below that of ancient Greece. Meanwhile, let us enjoy with more zest what we can see at the Academy and elsewhere. A new interest is imparted to the attempts in architecture, painting and sculpture by the doleful prognostics of the seers. If it be granted that in England we have not an aptitude for art, we can at least have the satisfaction of rising against the decrees of a pitiless destiny. The examples may not be equal to what are to be seen in the East, but as a manifestation of the strength of the Aryan will they are unmatched elsewhere.

GLASGOW ARCHÆOLOGICAL SOCIETY.

A MEETING of the Glasgow Archæological Society was held on the 19th inst. Mr. J. Dalrymple Duncan, hon. secretary, reported that a representation had been made by council of the Society on the subject of the proposed destruction of the island of Philæ by the raising of the level of the Nile for irrigation purposes.

It was also reported that a communication had been received from the Secretary for Scotland on the subject of the Antonine Wall, asking for a statement of those parts of the wall which are of special interest and best suited for protection, in order that it might be considered whether the owners of such portions of the rampart should be approached with the view of ascertaining how far they might be willing to agree to the application of the Ancient Monuments Act. The information asked for had been furnished, and it was hoped that the steps proposed to be taken might result in the preservation of some of the more interesting sections of the line of the rampart.

Rev. W. Lee Ker read a paper on "The Papingo." In introducing the subject, Mr. Lee Ker referred to a practice not unlike this pastime alluded to by Homer in his description of the games which accompanied the funeral of Patroclus. He also quoted from "Strutt's Sports and Pastimes" to show that the sport of the popinjay was well known to the Londoners in very early times, and mentioned a curious proviso which showed that the marksmen were protected against any harm done by their arrows, provided only they called out "fast" before shooting, just as a modern golfer fancies he can swing his driver as he pleases provided only he calls out "fore." Referring to the papingo, which is simply the Scottish way of spelling popinjay, it was noted as a strange fact that while this sport was doubtless very generally practised for centuries in Scotland, nevertheless nothing definite can now be learned respecting it except from records found in two neighbouring towns of Ayrshire, viz. Irvine and Kilwinning. Sir Walter Scott, indeed, in "Old Mortality," refers to it as played at Dalserf, in Lanarkshire, in the seventeenth century, and in Maybole at the beginning of this century, but even the traditions of these places afford no information upon the subject. An interesting paper was read showing that the paipingoe or papingo, for it is written both ways, was in full swing in Irvine in 1665, while the earliest record of the Kilwinning Archers states that on September 4, 1688, certain gentlemen "mett and conversed in order to the restoring of the ancient game of the papingo, formerly used to be practised in this place." Mr. Ker carefully considered a claim usually made by those who have written upon the subject, namely, that the sport was practised in Kilwinning as early as 1482. While admitting the possibility of this, he denied having proof for it, and so argued that Irvine and Kilwinning should be content to divide the honour of antiquity in connection with this matter between them, at the same time pointing out that the pastime was discontinued in Irvine probably about the year 1721, while it continued to be practised in Kilwinning till 1870. The

papingo, which was probably regarded as a mere pastime in connection with archery, was practised thus:—A piece of wood was formed so as to resemble an ordinary-sized parrot, and was attached to a pole, which in its turn was placed horizontally on an elevated place—in Kilwinning it was fixed on the tower of the old abbey, and was therefore 100 feet from the ground—the wings being at the beginning of the sport spread out and stuck loosely into the sides of the bird. The marksman stood at the foot of the tower, and therefore shot perpendicularly at the papingo. If he touched the bird with his arrow he got a prize, and if he winged it he got a larger one, viz. a piece of ribbon, which he proudly stuck into a button-hole of his coat. At the last stage of the competition the wings were taken out, and the bird itself “was made lower for shooting him af,” so that a slight touch of an arrow could “ding him doon.” In the olden times the prize given to the successful marksman was first and above all the honour of being captain of the papingo, and then, to distinguish him from all others, a piece of Persian taffetie, which he wore round his waist, and which was called a benn. In later times, however, the Persian taffetie was disused and a piece of silver was given instead, the cost of which was to be twenty shillings sterling. In 1724, however, a valuable silver arrow was presented by “David Muir, merchant in Kilwinning,” and this was so much thought of that the winner of it was not allowed to have it in actual possession, but only to retain it during the year of which he was the captain. Moreover, it was agreed that each successive winner of the arrow was to affix to it a badge of silver or gold “not under a crown value,” the result being that as time rolled on the old arrow could not hold all the badges and a new one had to be procured. When the pastime ceased 116 medals had been presented, many of which are very beautiful. The sport of the papingo was evidently regarded as a big business in early times, four days in Irvine and three days in Kilwinning being devoted to the sport, but from the beginning of the present century one day sufficed. At the gentlemen's papingo—for there was a men's papingo as well—all the county magnates presented themselves, though during the last years of the sport Glasgow gentlemen were the most numerous and influential. Jollity and mirth, dining and dancing, were the constant accompaniments of the festival. And yet it was all apparently very frugally done. It had to be frugally done. So far back as 1732 complaints were made of the smallness of attendance of members at the dinner on account of the expense, and the difficulty was got over by an arrangement that a dinner would be provided at the very moderate charge of 1s. each, “exclusive of wine.” But the captain had to pay up. His dinner must have cost him something, for he had to present a complimentary ticket to the parish minister, that grace might be properly said, and some other complimentary tickets besides. And he had to provide a bowl of punch to be drunk at the Crossbrae, and for this he had to pay one pound. True, there were privileges granted to him while the punch was being handed round. He had the honour of proposing prosperity to the trade and town of Kilwinning, and, at least in later days, he had the felicity of saluting the pouting lips of an aged lady of four-score years and tripping with her the light fantastic toe to the delight surely of himself, certainly of all present. And then there was the ball, without which no papingo day could be properly brought to a close. Evidently it was not everybody who could afford to be captain of the papingo. This sport of centuries terminates on July 28, 1870, though the men's papingo continued till 1877. The last medal was presented to the Society by Mr. James Hutton Watkins in 1866. The last captain was Mr. Neil, of Swinridgmuir, but as he was not present at the festivities of 1870, Mr. William Brown, of Parkend, presided. The records of the Society, the silver bow, arrows and medals are carefully preserved by Messrs. Hugh & Rob. C. King, bankers, Kilwinning, who are the heirs of the last secretary of the Society, the late Mr. Hugh King.

Dr. Murray, in proposing a vote of thanks to Mr. Lee Ker, said many must remember the archery meetings which took place in the Botanic Gardens at the end of Sauchiehall Street, and in Edinburgh the Royal Company of Archers was still a popular institution. He did not know that they shot at the papingo. There was a great deal of butt shooting in Glasgow. One butt stood behind the cathedral, another in the old barracks, and a third down at Stockwell; and one of the most serious riots which ever took place in Glasgow was in reference to archery shooting at the butts behind the cathedral. He did not know that they ever had the papingo.

Mr. Lee Ker, in acknowledging the compliment, said that archery shooting was practised in many towns in Scotland, but he had been unable to discover any trace of the papingo save at the places named in his paper.

Professor Young exhibited a collection of Roman coins found near Kirkintilloch. The collection was sent to the British Museum. One was retained. The ten shown were returned. Their interest lay in the fact that they present a consecutive series which ranged over about eighty years, the first dating

possibly 81, the last 161. They began with Domitian and ended with Antoninus Pius. The series was fairly complete of the currency of the empire during an important period of the occupation of Scotland. There was a coin of Adrian which was exceedingly interesting. The two coins of Antoninus were familiar enough types in the Roman series proper, but they presented a peculiarity which was frequent in provincial coins as being crenellated at the margins. The collection did not belong to him, but he hoped to acquire it with the permission of the authorities. The coins found in the neighbourhood of the Roman wall were not so numerous as one could wish them to be. There were several mentioned in Stewart's “Caledonia,” and he had discovered the *locale* of one of these coins and also of a ring. Professor Young also exhibited a series of casts of the numismatic history of Esculapius.

Votes of thanks were passed to Professor Young and to the Chairman, and the proceedings terminated.

CARPET DESIGNING.

A PAPER on “Design in Modern Carpets” was read by Mr. Alexander Millar at the meeting of the Society of Arts on the 18th inst. In the course of it he said:—

One of the charges most commonly brought against us is that we originate nothing good, that our best efforts are only feeble copies of Oriental or other ancient fabrics. Now, while this is partially—and it is only partially—true, I contend that even so far as it is true it is unfair. A test is applied to us to which other designers are not expected to conform. Take the art which is said to be the basis of all others. Are architects expected to design their buildings absolutely without reference to anything that has gone before? How do they train themselves for their work? Do they not study the great examples which have survived from the past, saturate themselves with their spirit, and fill their sketch-books with their details; and when they are called upon to design a modern building, do they not simply draw upon the store of material thus laid up, and evolve something suited to the special requirements of the case, but which in all its main decorative features is simply a reproduction of what they have assimilated, with something of their own superadded, the amount and quality of which is the measure of their originality? And in all this is not the architect of the present day simply following in the footsteps of his great predecessors? Did the men of the fourteenth century start from first principles regardless of what had been done in the thirteenth? Do we admire their work the less because we can almost trace the current of the thoughts of those who evolved it? Do we sneer at them as imitators and copyists? Could they have done such mighty works if they had refused to profit by the past, and had attempted to evolve cathedrals out of their moral consciousness? To ask these questions is to answer them, and at the same time to answer a great many of the criticisms which are directed against us.

For to compare great things with small, the cases of architecture and of carpets run on all fours. In each there was a great period when the art was living and progressive, and during which great typical examples were evolved, specimens of which still survive, and which are the despair of modern imitators. In each there was a period at which growth was arrested, and in each there has been a revival founded on the past, and in the midst of which we are more or less blindly groping our way towards the formation of what centuries hence will probably be recognised as a distinctive style.

The great sixteenth-century carpets are in their way unapproachable masterpieces, just as the Mediaeval cathedrals are, and in taking them as our exemplars we are in distinguished company. I must admit that in one respect the parallel is not complete, and that the architects have the advantage of us. Fortunately for them buildings are not portable. If they were, and if one may judge from analogy, this country would be as full of Eastern mosques as it now is of Eastern carpets.

There is a strong tendency at the present time to condemn all attempts to evolve ornament on the basis of what has been already done, and to exalt those who are attempting to originate decoration by going direct to nature and conventionalising her forms by methods of their own. I have very great sympathy with their aims, which at one time I fully shared. I remember at that period I looked upon a Louis XVI. scroll as something positively immoral. It would be difficult to withhold one's hearty admiration from the men who are endeavouring to realise such ideals were it not for the feeling which will obtrude itself, that there is a certain amount of insincerity and affectation in their attitude. Those I have in view seem to say to themselves, “Drawing is not our strong point; we find complicated arrangements troublesome, let us therefore devise a method in which drawing is of little importance, and let us create for ourselves a style involving a minimum of labour which shall be founded on nature as seen through our temperament,” and they succeed; but there is one element of their

temperament which they cannot eliminate and which is fatal to their success. They are always self-conscious and seem to say, "Go to, let us be naïve and quaint." They are trying to do of set purpose what the great original workers in decorative art did without thinking much about it. These did not stop to analyse their conceptions and to say, "I must reject this or that, however good it may be, because it is founded on what has been done before." In the modern work a certain *naïveté*, which is one of the greatest charms of all good original conventional ornament, is wanting; and it must be so from the nature of the case. But when in place of this *naïveté* we find an affectation of it, resulting in the production of what one of its practitioners, with commendable frankness, speaking of his own work, calls "crude symbols," we must be pardoned if we cannot quite accept the one as the equivalent of the other.

I cannot too strongly protest against the assumption by this school that what they cannot do ought not to be done. They insist, for instance, on structure showing prominently, and on the necessity for emphasising the repeat. Now it is much easier to make a design showing its framework than one which conceals it. Subtlety means difficulty, and the taking of infinite pains. If a designer finds that he cannot achieve it, well and good. It is very commendable for a man to recognise his own limitations, and to accept them as the bounds of his own efforts; but when he attempts to lay down the same rule for others, and to make his incapacity the measure of their endeavours, one can only think of the tailless fox, and marvel how history repeats itself.

I do not by any means mean to argue that good designs cannot be made in which repetition is insisted upon. What I protest against is the laying down of any rules of this kind whatsoever. The only rules which should be observed are those which naturally assert themselves: those which arise out of the nature of the fabric, and the purpose to which it is applied.

These men are unknowingly setting themselves no less a task than the opposing of a great stream of tendency, of pitting themselves against that law of evolution which governs the operations of the human mind as well as of organic nature, and controls even that wayward thing the artistic temperament, of which apparently it might be said that, like the wind, it "bloweth where it listeth."

Nothing is apparently farther from their thoughts than that the great generalisations of natural science have anything to do with them. But they would, notwithstanding, find it a useful discipline to give a little time to the study of its general principles. They would learn that we are all of us, decorative artists included, the creatures of heredity, modified to a slight extent by our present environment. Evolution has turned us out bipeds, and our wisest course is to make the best use of our legs, instead of trying to grow a pair of wings.

As in nature, so in art, no great achievement has been arrived at *per saltum*. There may be apparent exceptions, like the sports familiar to gardeners, as when a plant which has always borne white flowers suddenly produces a yellow one. But even here there is only a slight modification of what has gone before. And in art, as in nature, everything good and lasting has been founded on the past.

It seems to me that good decorative art must consist of two elements, the sum of the influence of what has been done in the past, plus the new element due to the idiosyncrasy of the artist. The first without the second is dead, the second without the first has life, but it is life striving to release itself from the guiding laws of evolution and heredity, and in the fruitless struggle it only produces abortions and monstrous growths. Suppose that in the organic world these great governing laws should cease to operate, what sort of animal and vegetable organism would be produced? And the same holds good in the world of mind.

I may seem to contradict myself in maintaining, on the one hand, that we are creatures of the past, and on the other that we have power to impress our own idiosyncrasy on our work, but both are true. To borrow an analogy from our physical structure, we have inherited an apparatus admirably suited for walking purposes, but we can deform it by tight boots; and so with our mental equipment. We can either work with nature along the lines we discover by observation of her methods, or we can, to a certain extent, thwart and impede her, with the certain result of crippling our bodies and stunting our minds, or in some cases, it may be, of causing unhealthy abnormal growths.

It is fortunate for designers of this type that their measure of executive power is frequently supplemented by a considerable development of the gift of literary expression. And in addition to their self-advertising solo performances, they are able to command a sympathetic chorus of admiration from their admirers among art critics; so, altogether, the voice of their trumpets is exceeding loud, and the not too discerning host of the Philistines is much impressed thereby. In such work as theirs there is more of the worker's delight in himself than in his work. The object seems not to be so much to

produce a thing of beauty as to cause people to say, "What a very original artist."

It seems to me that this school, when they and their work have receded into the past, will occupy much the same position in relation to art that the Euphuists of the seventeenth century have in literature. Both movements alike will be seen to have their roots in self-consciousness and affectation, and will take their proper place as mere excrescences on the main stem of progress. Or to take an illustration from recent literature, some of the work that is done by the extreme men bears about the same relation to good decoration that Lewis Carroll's "Jabberwock" does to good literature. In both you have invention, originality, freedom from convention, and from the debasing influence of style. Both also appeal to our sense of humour, though in the case of the designers this is quite unintentional, and we are asked to accept their Jabberwocks as serious works of art. When a designer of this type comes in contact with a manufacturer, his soul is moved to indignation if, with the best and most kindly intentions, he is shown specimens of good work as an indication of the line he might usefully follow; and here, by good work I do not mean mere commercial successes, but reproductions or adaptations of old fabrics, which are admitted on all hands to be good, and whose only fault is that they are not new. As, for instance, a manufacturer finds in some old brocade or velvet forms which, when suitably arranged, make a carpet satisfactory in all respects, except that it is not original. He is reproached with this, and admits the justice of the reproach, inasmuch as he would prefer to produce something entirely new, of which he and the designer might share the credit. But any attempt to indicate what is wanted is resented by the designer as an unwarrantable cramping and fettering of his powers. It seems to me, on the other hand, that the reception of such a suggestion in such a spirit indicates an amount of arrogance and self-sufficiency, which would be tolerable only if it were found in conjunction with a complete mastery of the subject and with executive powers of the highest order. If a modern designer can show that in any of his productions he has in any degree, in form and colour, approached the standard set up in the best work of the past, he might reasonably expect a mere manufacturer to give him a free hand, and to accept, with reverent gratitude, what he may be pleased to produce. But until he has so made good his claims, he can scarcely be surprised if his crude symbols are not accepted at his own valuation; nor must he expect the manufacturer to acquiesce in the calm assumption that he is a mere master weaver, bound to defer to the designer's amateurish notions of what a carpet should be, for amateurism is writ large over all the productions of the extreme men of this school.

We do not want dictation, and I have given, and shall give, some reasons why we should not be expected to submit to it. Some of us have devoted many years to the study of the subject, and have brought to bear upon it such small measure of artistic training as we have been able to acquire. Can it be expected that we shall meekly accept the crude notions of the *dilettanti* dabblers who conceive themselves qualified to teach us? Their pretensions remind us of Triplet in Charles Reade's "Peg Woffington":—"Triplet was teaching the butcher's son how to plant onions. He had never seen onions planted, but he was one of those people who are always ready to teach anything to anybody." The assumption that the designer who has made no special study of the requirements of a particular fabric should have a free hand whenever he chooses to turn his attention to it, is so ridiculous that it need only be stated to expose its absurdity. It is as though a sculptor should expect a commission for a picture without having shown the slightest capacity for dealing with colour. But we find the doctrine that architecture is the foundation of all the arts has taken such hold of some of its practitioners, that they consider themselves qualified to make designs, not only for houses, but for all things that are therein—an assumption which, in the case of carpets, has scarcely been justified by results.

It may be thought that I am going out of my way to attack this new English school of designers. I have said that I sympathise with their aims. I share their desire to escape from the bondage of tradition, and to create something which is their very own. But I think that, like other reformers in the past, in rebelling against authority they have gone to the other extreme, and are therefore certain to defeat their own ends. I should like to see their enthusiasm for art and their undoubted inventive genius directed into channels where they could do work of permanent value. And I deeply regret that my own special craft must suffer from the lack of their co-operation, which would otherwise be gladly sought, so long as they maintain their present uncompromising attitude. I am convinced that their theories and their practice are fatal to the advance which I desire to see. Through their close relations with a certain section of the press they exercise an influence which I think a harmful one, and I fear that the glamour thus thrown round them and their works may result in the production of a host of feeble imitators, a result which I am sure they will agree with me is too awful to contemplate.

On one occasion the late Sir Philip Owen undertook to tell me how manufacturers should avail themselves of the advantages offered by the training schools and museum at South Kensington. He said, "You should take one of the young men who has passed through the schools with distinction, pay him a good salary, leave him entirely free and unfettered, let him remain here drawing inspiration from the wealth of material here accumulated, and take what he gives you. In this way only will you get freshness and originality."

Now this, which may, I suppose, be taken as the official view of the relations which should subsist between South Kensington and manufacturers, differs from that of what I have called the new English school, inasmuch as the latter eschews the idea of profiting by the work of the past, but they are at one in proposing to give the manufacturer no voice in the matter. I did not act upon the advice for several reasons. First, experience tells me that it is utter waste of time for any one who has not had a thorough technical training to do work which shall be practically useful, and a manufacturer cannot be expected to pay for failures due to this cause, though, as a matter of fact, commissions are not unfrequently given to promising young designers, the results of which are paid for and then put in the fire. Then if it be a question of imbibing inspiration from the great works of the past, a manufacturer is much more likely to get good results from a designer who has been trained in his own methods, and knows exactly how to select and adapt to practical purposes, than from a young beginner, however gifted he may be.

I cannot withhold my conviction that, so far as carpets are concerned, our art-training schools are not sufficiently in touch with manufacturers, to their mutual disadvantage. And I think this may to some extent arise from the frame of mind to which I have referred. Manufacturers are not invited in any way to co-operate, their advice is not sought. That their ideas upon the artistic side of designing should be ignored is not so much to be wondered at, but why their help has not been sought in technical matters is inexplicable. The result is seen in the carpet designs at the annual exhibition of students' work. I have carefully examined these from time to time, and found that not one of those shown last year was free from technical faults, most of them so radical as to make the designs quite useless.

(To be continued.)

TESSERÆ.

Opus Alexandrinum.

WE may take it that, as a general rule, the floors used by the ancients presented a general mass of pleasing ornamentation, with just so much colouring as would serve as a sort of base for any decoration on the walls, but without being at all obtrusive in themselves. With the architects of the early Christian times, those to whom we owe the great basilican churches of Rome, Ravenna, &c., we get an altogether different class of paving, the Alexandrine. This seems to derive its name both from the Emperor (Alexander) who introduced it into Rome in the third century, and from the place whence he derived it, viz. Alexandria. It had been no doubt used in the East long before by the Pagans, but it is so commonly found in the Christian churches that it is almost identified with them. We have a very early example of this in the famous Byzantine church of St. Vitale, at Ravenna, and several others, though in fragments, in the various churches in Constantinople. One of the most characteristic specimens is from St. Lorenzo Fuori. This seems to be formed of circular slabs of marble porphyry and other coloured marbles or granites, taken as centres, with patterns in small mosaics taken round these in geometrical forms and imbedded on slabs of marble. The large centre circles are very irregular in outline, but the sweeping lines of the small mosaics round them are truly struck, so that the borders are of very irregular width. In this case and in that of all (or nearly so) the Alexandrine mosaics, the whole of the materials are of a kind to bear a fine polish. The green is of a verde antique, the red of porphyry, and the ground of white marble, the whole undoubtedly of a much more gorgeous character than that of the ancient Roman pavement. But we must remember that the whole colouring was that of the actual material used. There was nothing but nature in the decoration, and this is never gaudy. Examine a piece of verde antique, a deep red porphyry, and it will be found that it is little more than of a rich neutral tint—nothing of the light green, blue and red of an artificially made tile. Then the marble ground, white enough when first laid, became toned down to a rich stone colour by the damp which rose to it from the earth on which it lay; and the whole series of patterns was lowered in brilliancy in the same way as the ancient Roman were, though not to the same extent, by each of the pieces which composed it being bedded in a brown cement, with joints which were often very wide and carelessly made. So

that when these pavements had the gloss slightly taken off them by time and wear, they must have formed a very beautiful pavement of rich, but subdued colouring, without a single piece of positive colour about them. In their present state nothing can be more effective. And we see their effect as well probably as when they were new, because the colouring to the walls and ceilings, then fresh, is now subdued as the pavements are. It is scarcely necessary to mention that there are a few specimens of this work in England, as at Westminster Abbey and at Canterbury. But they are on too small a scale to give a good idea of their general effect when used throughout the area of a large church. If we come down to later times amongst the works of the Mediæval architects here and abroad, we get the same succession of subdued half tints, however deep in tone they may be.

Ancient Irish Churches.

In nothing was the Irish Church so indebted to the stranger as in architecture. The buildings in the service of religion before the invasion of the English were of a very unpretending character in Ireland. The door was generally to the west; the windows were narrow, splayed inwardly and always unglazed, because glass for glazing purposes was almost unknown. The churches were small in dimensions, seldom did they reach 60 feet in length and never more. Poverty of spirit was displayed even in the service of God. The Irish churches were nearly all wooden structures. Dr. Lanigan makes very light of this matter and says:—"In building these churches of wood the Irish had no peculiar motive imaginable except that they were very little in the habit of erecting any sort of edifices of stone or other materials. Accordingly nothing can be more ludicrous than the assertion of a silly, presuming author that the doctrine and discipline of the Irish Church were averse to stone fabrics. Even before the twelfth century some stone churches had been erected in Ireland, although it was not until that period that this fashion was introduced into some of the northern parts." The learned Doctor makes the very natural remark that it cannot be expected there should be any remains of such wooden structures at present. Some idea may be formed of them by those who have seen the wooden churches thrown up by the Free Church of Scotland at the time of the disruption. In the Irish churches, no doubt, the workmanship was much more rough, but some of them were so ornamented as to present a splendid appearance. The finest perhaps of these was at Kildare, founded and richly endowed by St. Bridget. As described by Cogitosus in the early part of the ninth century, it was large and lofty and adorned with paintings. It was composed entirely of wood, and cruciform on plan. At the head of the cross was placed the altar, and this part was entered by a door at each end. The right door was for the bishop and those who were to assist in the service; the left was for the abbess and the nuns. The body of the church was divided into two equal parts by a wooden partition, in order to separate the sexes, who were not allowed to mix in any of the Irish churches. For the men there was a large door not in the front, but in the side, and for the women a corresponding door at the opposite side. As this was one of the grandest of the churches, a sort of cathedral, which vied with Armagh, we may easily infer the style of those which existed in inferior places.

Modern Art.

One marked characteristic of modern painting is its accurate study of nature and tendency to detail. The age, whether we turn to science, commerce or legislation, is one of detail, and art partakes of the general bias. This is specially seen in landscape by the close study of nature throughout and in the minute realisation of foreground objects. This careful elaboration may likewise arise, in some measure, from the lack of strong impulsive genius. Men in whom genius is paramount are frequently impatient of close study; they are not eminently learned; the one necessity of their nature is an outpouring expression. Now the absence of this overflowing impulse is especially conspicuous in extant art. It is, perhaps, a misfortune, resulting from position, that makes modern artists copyists and compilers. The first artist could not possibly copy or compile, the last can scarcely help it. The first man is original, the last learned. Still even the latest manifestation of genius, true to its inherent constitution, must create an originality of its own. Painting, like architecture, failing in original creative capacity, falls back upon greater accuracy and truth than was attainable in earlier ages. But if living art can show no examples of giant greatness, at least the strength which does exist is widely diffused. The arts have infused themselves into manufactures, and, in return, the spirit of manufacture has invaded art. Ancient schools and epochs originated in and centred around men of genius; it is now sought to organise such periods through associations called "academies." Nevertheless, let us rejoice that we live not in utter darkness; in the absence of suns, satellites, with borrowed light, may cheer our way.

Roman Architecture.

When the best period of an art is over, and a degenerated and imitative one succeeds, it is to be expected that the latter should exhibit a non-comprehension of some, and an extravagant use of other, of the means employed to affect the imagination in the former and purer time. This was the case with Roman architecture. We may discover in it a lively appreciation of the expressional effect of some few Greek details, and a tolerable comprehension of the source of that effect; but the Roman architects had no knowledge or feeling of the severity with which the various elements of the Greek art were subordinated to the perfect utterance by the whole of the language which was spoken more or less plainly by every part. Isolated details, therefore, acquired an independent importance; the colonnade, which in Greek architecture had no significance without reference to the supported entablature, was raised, as it were, for admiration on a series of pedestals; single shafts rose beneath nothing in the places of public concourse; and attempts, entirely and necessarily abortive, were made to reconcile and harmonise certain of the Greek details with the new and contradictory element of the semicircular arch. Circular form was diligently sought for. The Doric shaft became a plain cylinder; the outlines of mouldings, in Greek architecture conic sections, became segments of circles; the dome rose behind the pediment, the horizontal entablature was at last wholly relinquished, and the arch sprang from column to column, bearing with it the entablature curved, and in this condition of impotence and inconsistency the architecture of pagan Rome was transplanted to Byzantium.

Eighteenth-Century Wall-Painting.

Wall-painting professed to be the handmaid of architecture; when the mason and carpenter and plasterer had done their work, its professors made their appearance and covered walls and ceilings with mobs of the old divinities, nymphs who represented cities, crowned beldames for nations, and figures ready ticketed and labelled answering to the names of virtues. The national love of subjecting all works to a measure-and-value price, which had been disused while art followed nature and dealt in sentiment, was again revived, that these cold mechanical productions might be paid for in the spirit which conceived them. The chief apostles of this dark faith were two foreigners and one Englishman, Verrio, Laguerre and Sir James Thornhill. Rubens, indeed, and others had deviated from nature into this desert track, only to return again to human feelings with a heartier relish. But Thornhill and his companions never deviated into nature. The shepherdesses of Sir Peter Lely were loose in their attire, loose in their looks, and trailed their embroidered robes among the thorns and brambles of their pastoral scenes in a way which made the staid dames of the puritans blush and look aside. But the mystic nymphs of Thornhill or Laguerre, though evidently spreading out all their beauties and making the most of their charms, could never move the nerves of a stoic. It is in vain that a goddess tumbles naked through a whole quarter of the sky. It is astonishing how much and how long these works were admired, and with what ardour men of education and talent praised them.

Pericles and Athens.

Pericles was not less ambitious for the greatness of Athens than the most daring visionaries; but he better understood on what foundations it should be built. The objects of Pericles were to strengthen the possessions already acquired, to confine the Athenian energies within the frontiers of Greece, and to curb, as might better be done by peace than war, the Peloponnesian forces to their own rocky barriers. The means by which he sought to attain these objects were, first, by a maritime force; secondly, by that inert and silent power which springs as it were from the moral dignity and renown of a nation—whatever, in this latter respect, could make Athens illustrious made Athens formidable. Then rapidly progressed those glorious fabrics which seemed, as Plutarch gracefully expresses it, endowed with the bloom of a perennial youth. Still the houses of private citizens remained simple and unadorned; still were the streets narrow and irregular; and even centuries afterwards a stranger entering Athens would not at first have recognised the claims of the mistress of Grecian art. But to the homeliness of her common thoroughfares and private mansions, the magnificence of her public edifices now made a dazzling contrast. The Acropolis that towered above the homes and thoroughfares of men—a spot too sacred for human habitation—became, to use a proverbial phrase, “a City of the Gods.” The citizen was everywhere to be reminded of the majesty of the State—his patriotism was to be increased by the pride in her beauty—his taste to be elevated by the spectacle of her splendour. Thus flocked to Athens all who throughout Greece were eminent in art. Sculptors and architects vied with each other in adorning the young Empress of the Seas—“as a vain woman decked out with jewels,” was the sarcastic reproach of the allies. Then rose the masterpieces of Phidias, of Callicrates, of Mnesicles, which even either in their broken remains or in the feeble copies of

imitators less inspired, still command so intense a wonder and furnish models so immortal. And if, so to speak, their bones and relics excite our awe and envy as testifying of a lovelier and grander race which the deluge of time has swept away, what in that day must have been their brilliant effects—unmutilated in their fair proportions—fresh in all their lineaments and hues? For their beauty was not limited to the symmetry of arch and column, nor their materials confined to the marbles of Pentelicus and Paros. Even the exterior of the temples glowed with the richest harmony of colours and was decorated with the purest gold; an atmosphere peculiarly favourable both to the display and the preservation of art permitted to external pediments and friezes all the minuteness of ornament, all the brilliancy of colours; such as in the interior of Italian churches may yet be seen—vitiating in the last by a gaudy and barbarous taste. Nor did the Athenians spare any cost upon the works that were, like the tombs and tripods of their heroes, to be the monuments of a nation to distant ages and to transmit the most irrefragable proof “that the power of ancient Greece was not an idle legend.” The whole democracy were animated with the passion of Pericles, and when Phidias recommended marble as a cheaper material than ivory for the great statue of Minerva, it was for that reason that ivory was preferred by the unanimous voice of the assembly. Thus, whether it were extravagance or magnificence, the blame in one case, the admiration in another, rests not more with the minister than the populace. It was, indeed, the great characteristic of those works that they were entirely the creations of the people: without the people, Pericles could not have built a temple or engaged a sculptor. The miracles of that day resulted from the enthusiasm of a population yet young—full of the first ardour for the beautiful—dedicating to the State, as to a mistress, the trophies honourably won or the treasures injuriously extorted, and uniting the resources of a nation with the energy of an individual, because the toil, the cost, were borne by those who succeeded to the enjoyment and arrogated the glory.

Gothic Column.

The Gothic architect, after he had once perceived the kind of effect which it was desirable to substitute for the Lombard expression (the Lombard construction having been discarded), found, almost ready-made to his hand, one of the most important of the numerous means of producing it, namely, the Lombard ornamental column, with its base and capital, which in various ways expressed a total independence of constructive origin. There was, however, this difference between the Lombard shaft and the Gothic shaft—that the first was constructively superfluous, and expressed as much; whereas the last had really to take a primary part—to bear burdens, and yet appear to do nothing of the sort, the burden and bearing members being alike transformed into portions of the great vertical stream of piers, pointed arches, groined vaults and vaulting shafts. The simplest way of obtaining this effect was to leave out base and capital altogether. It took some time, however, for architects who had always regarded a capital and a base as the natural extremities of a shaft to get rid of the tradition, and when at last they seem to have done so, it was found that a base of some sort was essential to safe construction, and that there were serious artistical objections to dispensing altogether with the capital. When capitals were totally omitted, as sometimes was the case in splendid examples—Cologne among others—the eye became sensible of an unpleasant dubiousness as to the point from which the arch sprang, and when the moulded or many-shafted pier was the stem from which arose a system of still more numerous divergent ribs and mouldings, the capital was needed to cover the junction of the two systems, its omission necessitating the very disagreeable alternative of the “discontinuous impost.” Elaborate devices were therefore invented for denying and, as far as possible, reversing in their visual effects the nature of bases and capitals as constructive members. Mr. Ruskin condemns a large class of Gothic capitals as “unnecessary and ridiculous” because they have “no bearing power.” Now we hold that this expressed absence of any increase of power at the point of the capital is the only condition under which capitals could have been admitted into Gothic architecture, and that they are neither “unnecessary” nor “ridiculous” because they perform what we have seen to be the important function of marking the termination of the shaft or pier and the commencement of the arch. Another, and a very good reason for the existence of capitals in Gothic architecture is one and the same with that which constitutes the merit of the horizontal channels under the Doric ovolo, namely, that they really add to the ascendant vigour of the members on which they occur by opposing to that vigour an obstacle to be conquered. Mr. Freeman, whose remarks on some of the means of producing the effect of aspiration in Gothic architecture are particularly valuable, rightly says, “When there is no strife there is no victory: the vertical line cannot be called predominant unless the horizontal exist in a visible condition of subjection and inferiority.”

NOTES AND COMMENTS.

SOME years ago Mr. GEORGE MURRAY, of the Museum of Natural History, gave an account in *The Architect* of the *Merulius lacrymans*, the organism which is the cause of dry-rot. The French have of late taken to study the subject, and the *Temps* has had several communications on it. M. CRIÉ, a professor of Rennes, says that for years the *Merulius lacrymans* has been his favourite study, and he has collected evidence of a great many accidents caused by its presence in scaffolding and timbers employed in construction. He believes that the danger arises from a destruction of the woody elements, and that it is absurd to suppose the exterior of a piece of wood always appears superficially sound while the interior is decomposed. He also says it is an error to believe that the danger arises only in damp or imperfectly-ventilated places. Timber which presents parasitic alterations and lesions will be found in dry positions. M. MANGIN, of Douai, is of opinion that the fungi can be destroyed by applying sulphuric acid. He mentions a case of a house where dry-rot appeared forty-five years ago, and a floor was destroyed. The rest of the wood was washed with the acid, and since no trace of the fungus is perceptible. He believes that if the acid were applied as soon as the wood-work was complete, there would be no chance for the *Merulius*. Mr. MURRAY found that paraffin was the most efficacious destructive.

THE PICTET family is closely associated with the intellectual development of Geneva. Sir J. D. FORBES says that towards the close of the last century the city had nearly reached the zenith of its reputation as a nursery of the sciences, for "the most eminent and independent of its citizens were proud of being also amongst its instructors, and the office of professor was then, as it still is, considered one of the most honourable in the State." At that period MARC-AUGUSTE PICTET was, according to FORBES, known and esteemed by the learned throughout Europe. He was a great authority on heat, and among his good deeds was the establishment of meteorological observations at the convent of the Great St. Bernard, which are still continued, and are among the most important that have been made. M. RAOUL PICTET, who is one of the most eminent of the present citizens of Geneva, has resolved to uphold the zeal of his family for science in the worthiest manner. In connection with the exhibition which is to be held in 1896 he proposes to set up what he simply calls "un établissement scientifique," but which will be a palace dedicated to the sciences of which Geneva was the nursery. In it the applications of science will be exemplified on the largest scale, and one of the lecture-rooms will accommodate 350 people. As is only natural, there will be as complete a collection of apparatus connected with thermodynamics as can be obtained, in order to explain the developments of that branch of science since 1791, when PICTET published the important work which he modestly called "Essai sur le Feu." As a further experiment on a large scale, M. RAOUL PICTET intends to show what can be done in reducing temperature by the construction of a circular gallery and restaurant, which will remain uniformly cool and refreshing throughout every summer. This work must recall what was anticipated by PIERRE PRÉVOST when dealing with the "Movable Equilibrium of Heat." An Institut Raoul Pictet, which is also to be set up, will be a further addition to the scientific resources of Geneva.

WHILE the staff and students of the English school at Athens are pottering about barren spots and performing feats of easy measuring, the French and Germans are increasing their triumphs as explorers. According to the last account the French have discovered the caryatids and frieze of the Temple of Apollo at Delphi, and expectation is on tip-toe about the treasures that will follow. It should be remembered that not only the Greeks, but Phrygians, Lydians, Persians, Assyrians, Phœnicians, Italians and the Hyperboreans themselves, says LUCIAN, sent offerings to Delphi. The temple was undoubtedly plundered at least eleven times before NERO carried off a hundred statues from

it, and other Romans and Goths were afterwards busy in the spoliation of a sanctuary that had acquired an universal reputation. But the eagerness of the vandals to seize their prey may have caused little treasures to be trodden into the soil, which now would be more precious than jewels. Nor can we suppose that all parts of the temple were ground into rubbish. That the site of the building was for ages covered with humble huts is not to be deplored, for the place became in consequence too mean to excite the cupidity of later investigators. Besides the temple, there is much else in Delphi which is likely to reward exploration if properly conducted.

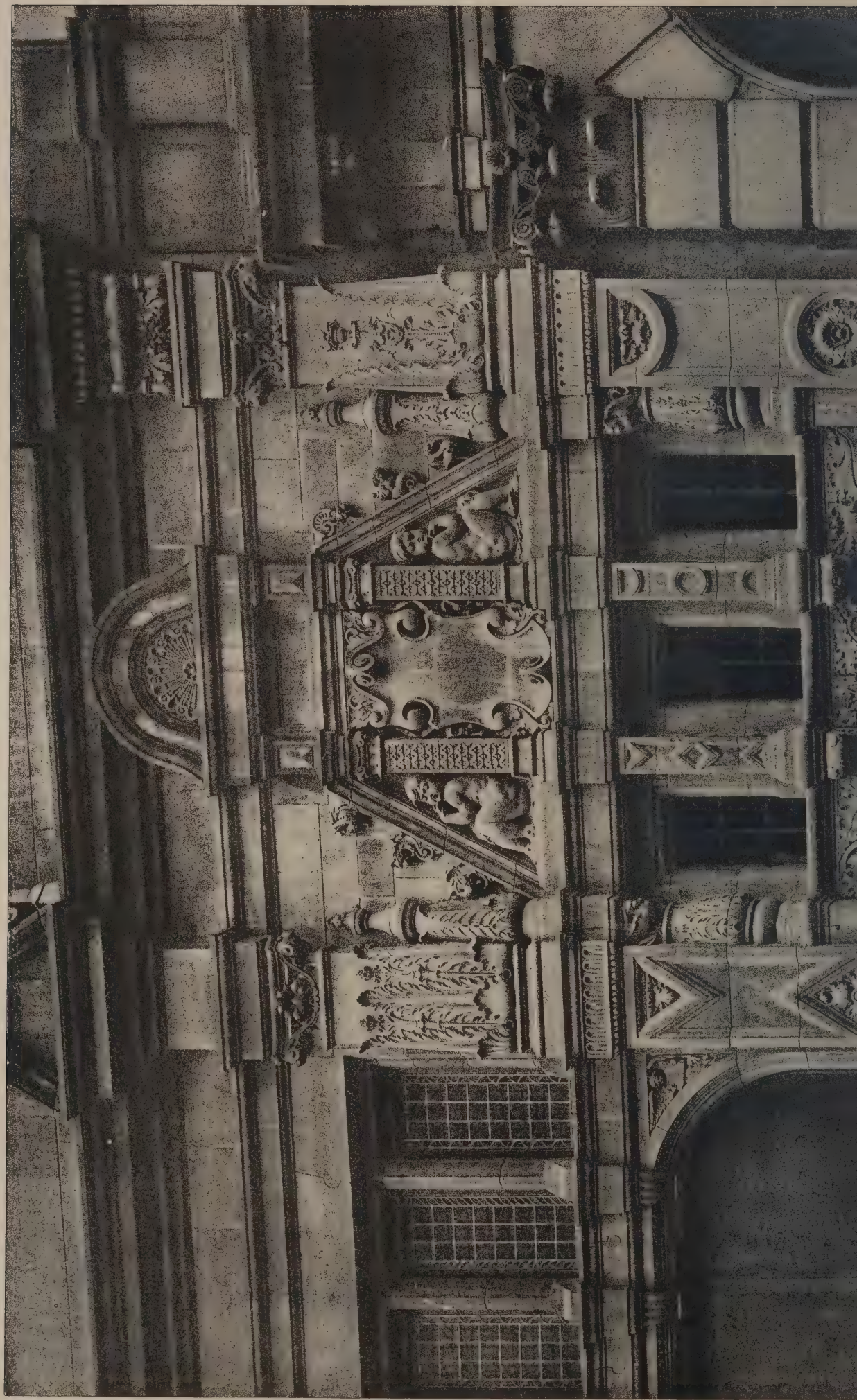
A CONFERENCE of representatives of Metropolitan local authorities and others was held at the Vestry Hall, Paddington, last week. After hearing an explanation by Mr. H. H. COLLINS of the general character of the London Streets and Buildings Bill, the following resolution was passed, with only one dissident:—"That this conference, whilst fully admitting the expediency and justice of dealing with land, and regulating the construction or reconstruction of buildings thereon in such a manner as may be conducive to the public interest, considers that many of the clauses in the Bill are neither just nor expedient, inasmuch as they would tend to check rebuilding and injuriously retard the development of freehold and leasehold estate; and, further, that compensation should be given where property is taken under compulsion."

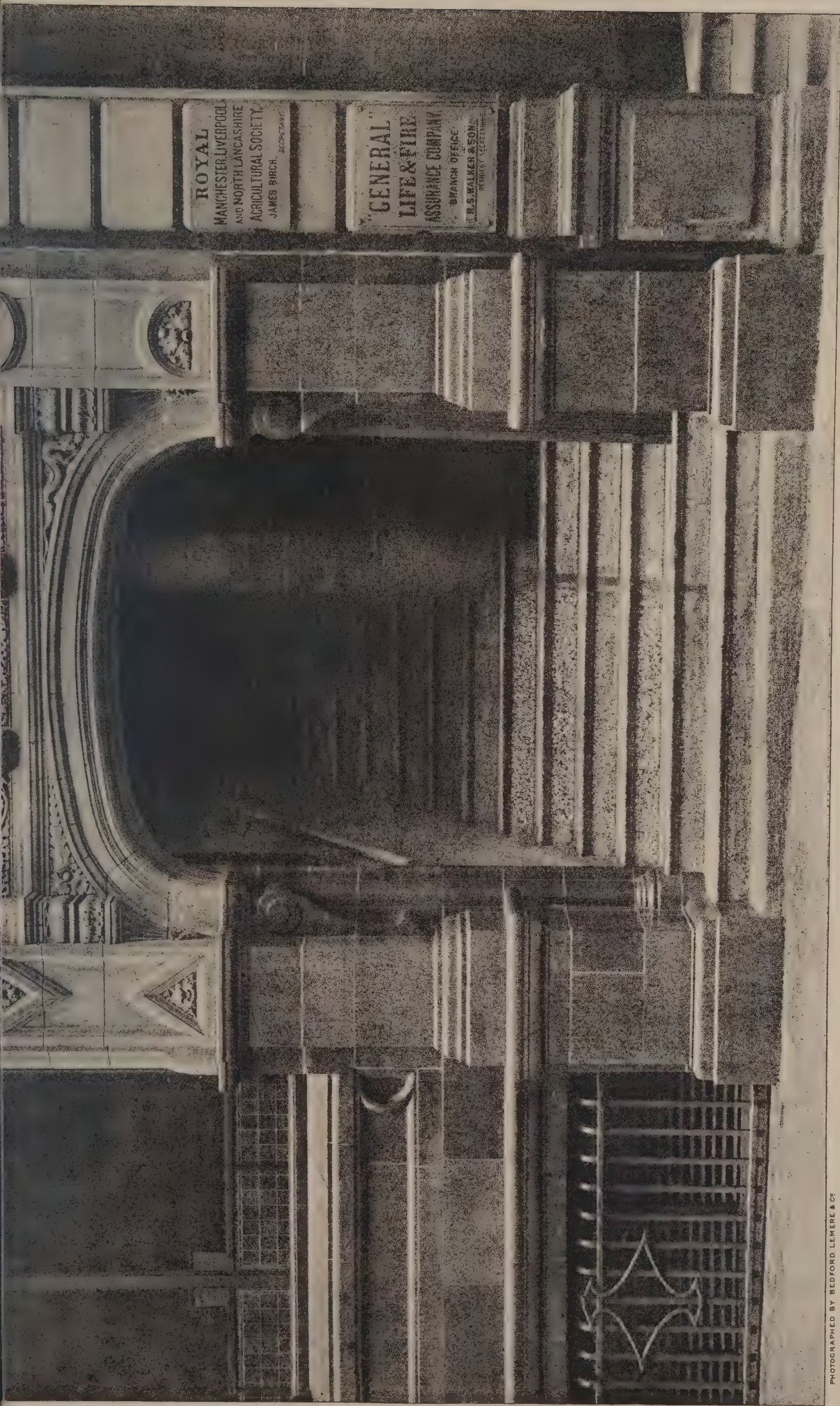
EXPERIENCE shows that it is most difficult to employ landscapes in wall-decoration, especially when figure subjects are to be seen in the same room or building. French artists endeavour to attain the end by the introduction of conventional forms in order to suggest that the picture is not an ordinary landscape. M. PAUL ROBERT has solved the problem in a novel way. In 1886 he was offered a commission for three immense panels which were to adorn the staircase of the Musée des Beaux-Arts in Neuchâtel. M. ROBERT wished to represent the district as nature had created it, and at the same time to express the desire of the people for the symbolising of their loyalty to Protestantism. He has therefore surrounded the landscape scenes with figures which represent all the virtues, and are as expressive as any to be seen in the churches of the Catholic cantons. The three panels have required the unremitting toil of eight years, and are probably the most remarkable of the modern examples of wall-decoration.

AMERICA is not the only country where custom-house officers become a torment to artists. The Italians appear to have resolved that they will outdo all the rest of the world in obstructive regulations. The majority of the pictures sent back from the Chicago exhibition appear to have gone through adventures by land and sea before they reached their owners. The adventures of Italian works are not yet ended. Those which belonged to artists in Rome did not arrive in Genoa until February 24. It required no less than forty days before they could overcome the difficulties of the way between Genoa and Rome. Having reached the capital, the pictures are still kept in durance because some formality was not gone through in Chicago. When natives are treated so harshly, English travellers in Italy need not complain of their experience.

It is proposed to ask a vote of 4,000*l.* from the French Chambers in order to pay for the expenses connected with the competition for designs for the international exhibition of 1900. The architects will be allowed to deal with the existing buildings on the Champs de Mars according to their discretion. There will be no stipulation in the conditions about the retention of any of the galleries remaining from the exhibition of 1889. If the money is granted no time will be lost before arranging the competition, in order that a design may be selected before the close of the year. It is proposed to adopt a new system of arrangement, and instead of exhibiting machines apart, they are to be introduced in the vicinity of the objects which they produce.

The Architect, April 27th 1894.





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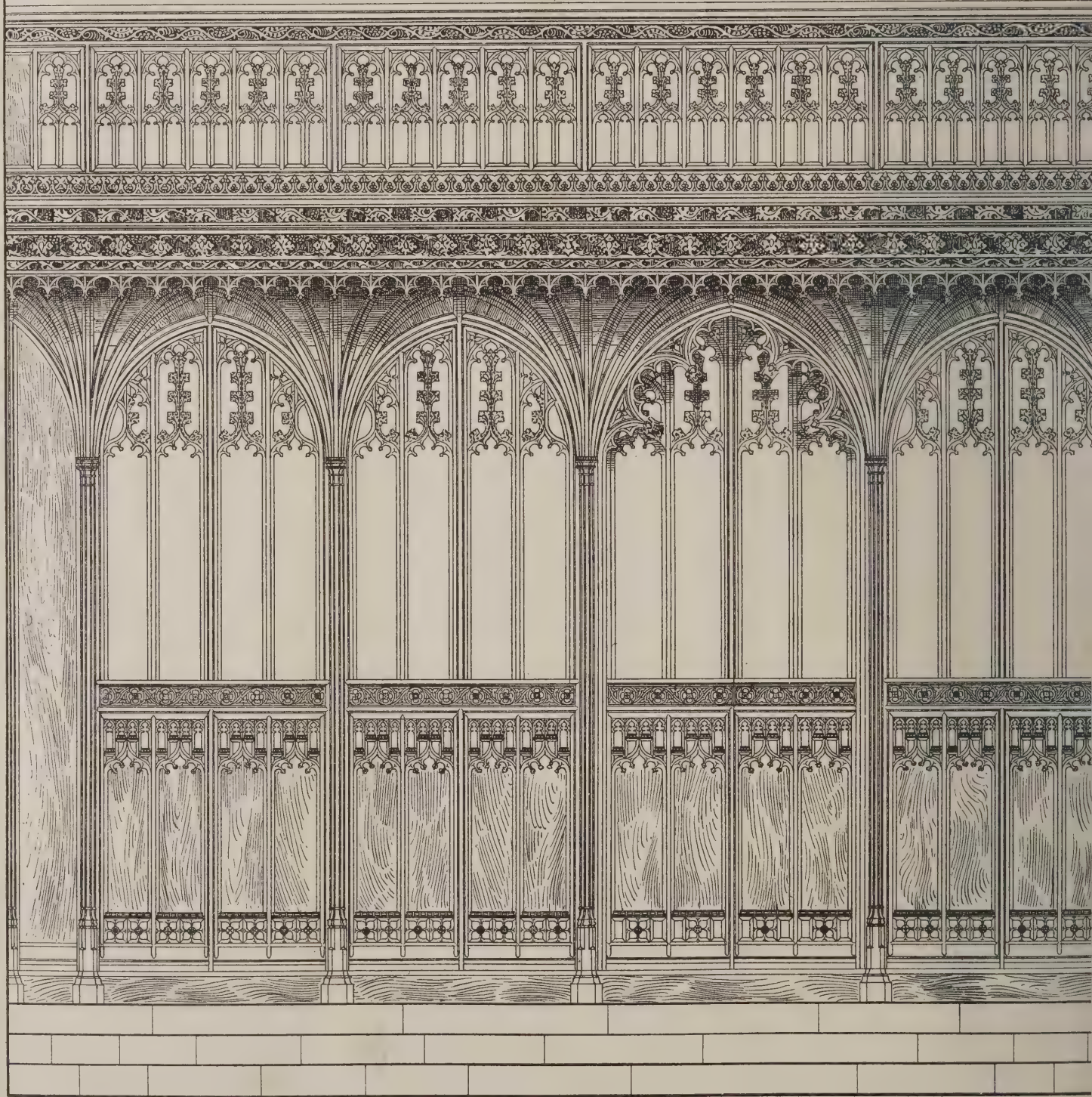
ADELPHI BANK, LIVERPOOL: THE PORCH.
W. D. CARÖE, M.A., Architect.





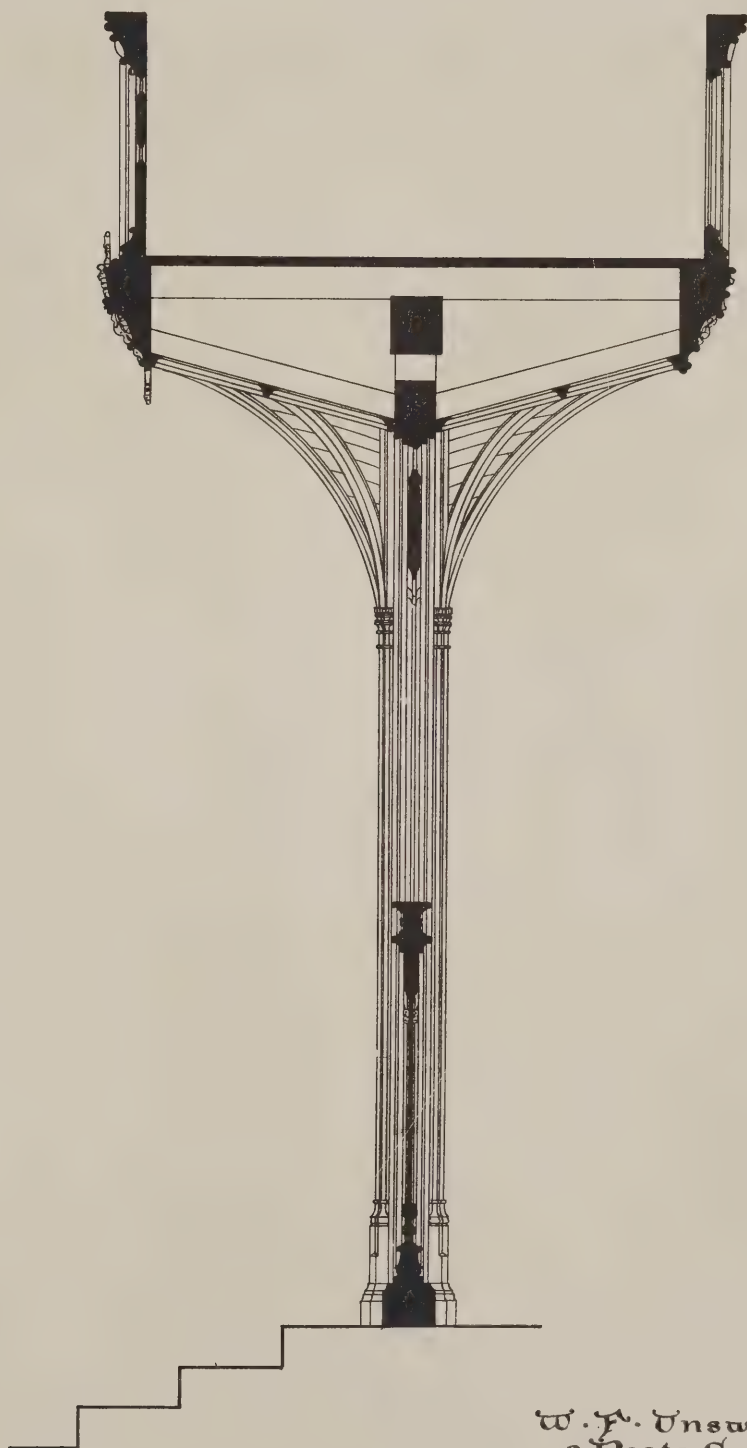
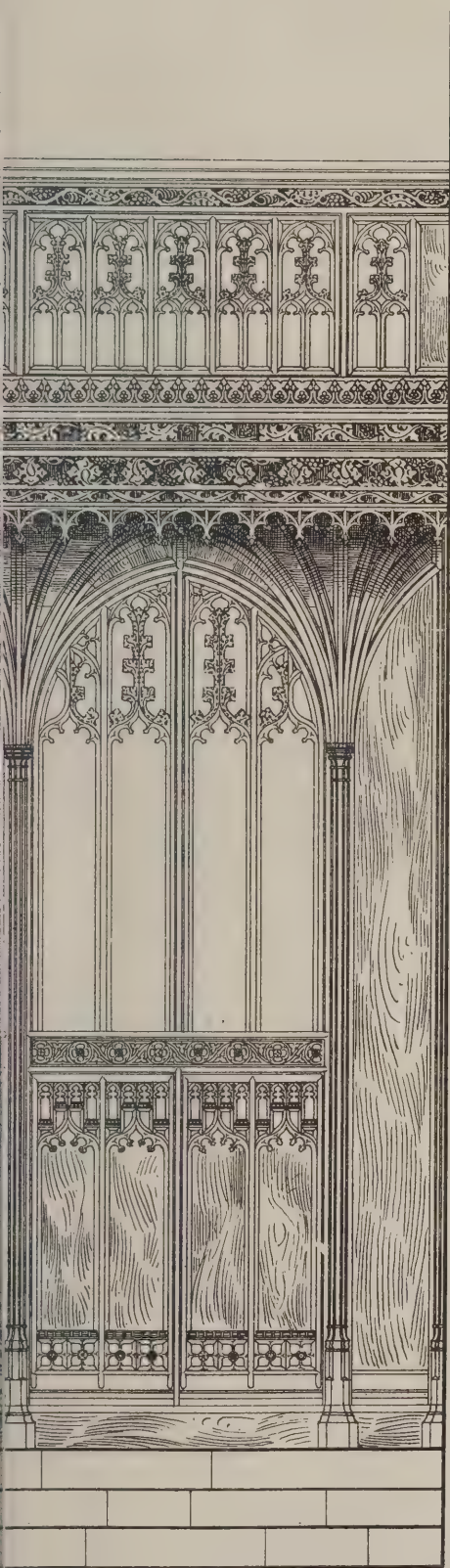
S. Mary's : Remsing

Restoration of Rood Screen



West Elevation

April 27th 1894.



Section

W. F. Unsworth
2 Poets Corner
Westminster

ILLUSTRATIONS.

ADELPHI BANK, LIVERPOOL—THE PORCH.

NEW OFFICES, "NORTHERN DAILY TELEGRAPH," RAILWAY ROAD, BLACKBURN.

THIS building, which we illustrate in our present issue, has just been completed for the North-Western Printing and Publishing Company, Limited. It occupies a most convenient and commanding site close to the principal entrance to the railway station. The buildings are admirably arranged for the purposes for which they are erected. On the ground floor very commodious accommodation is provided in the shape of a large general office for the transaction of public business, private offices for the managerial, editorial and reporting staff, with cloak-rooms and all other conveniences in connection therewith. The main entrance is at the corner of the building, as shown in the drawing. On the same floor, and approached from the side street, is a very large machine-room and rooms for the receiving and despatching of parcels, &c. Leading from the machine-room is a convenient office for the supply of papers to the news-agents and news-boys' rooms; these rooms have separate entrances from the back street. The first floor is occupied by a very commodious compo-room, stereo-room, office, and other conveniences. The basement is very extensive, and contains large paper and other stores, damping-room, boiler-house, fan-room, dynamo-room, &c. This floor has separate entrances from the back roads. The elevations are of Accrington bricks, with buff terra-cotta dressings from Burmantofts, Leeds. The dome of the tower is covered with copper. The building is fireproof, and the construction throughout is of the best possible character. The machinery and other fittings are of the most modern and approved make. The heating and ventilation scheme has been carried out by the Sturtevant Engineering Company, Queen Victoria Street, London, and the electric-lighting installation by Mr. THOMAS BARTON, of Blackburn. The contractors for the building are Messrs. JOHN HIGHTON & SON, Witton, near Blackburn, and the whole of the works throughout have been carried out from the designs and under the superintendence of Messrs. STONES & GRADWELL, architects, Richmond Terrace, Blackburn. Mr. EDWARD LEWTAS, of Blackburn, was clerk of works. The total cost is about 20,000*l*.

ST. MARY'S, KEMSING—RESTORATION OF ROOD-SCREEN.

THIS is a most interesting piece of old work, the detail being very refined, and the carving most delicate in treatment and executed in a masterly manner. It is without doubt one of the finest examples of this date of work to be found. The lower portion was in a fair state of preservation, but in the upper part much of the tracery had disappeared. There were a few perfect pieces remaining, which left no doubt as to the original design. The groining and rood-loft over had entirely disappeared. Traces of coloured decoration are still remaining, but are almost entirely obliterated.

The restoration has been most faithfully carried out by Mr. UNSWORTH, architect, and the work executed by Mr. HITCH, sculptor.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute of Architects was held on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

The decease was announced of Colonel Haywood, F.R.I.B.A.

The business of the meeting was the reading of papers in connection with the art standing committee, on the subject of furniture in conjunction with architecture, under the title of

Furniture: Domestic and Ecclesiastical.

Mr. JOHN BELCHER read the first paper, and remarked that the subject selected was one that should occupy the attention of architects. What dress was to individuals as indication of position and character, so was furniture in relation to buildings. In tracing the first origin of furniture, he dated it from migratory races—the chest in which they carried about their possessions, and which served as table, seat, &c., being the progenitor of the press, cabinet, dresser or sideboard, to which legs were added when locomotion was no longer the custom:

With fixed and permanent abodes came in the interlacing of furniture with buildings as fittings. For transitory purposes furniture should be selected for general utility, adapted in kind, size and scale to its surroundings, and the movable objects should bear proper relation to the fittings; absence of proportion and scale would reduce and spoil the apparent size of a room. The selection of disproportionate furniture was a common error into which inexperienced persons fell who purchased ready-made furniture of a sloppy description. Among the best work of the past Mr. Belcher instanced work in Italy and the Netherlands, then that of France, and later, in the eighteenth century, that of Chippendale, Heppelwhite and Sheraton, combining a maximum of strength with a minimum of material in elegant forms. In all periods there had been recognised formulæ which characterised good work, and these were described. Also in all good work form and construction were the result of long tradition, and characterised by directness and fitness of purpose. Furniture might be, no doubt, decorative, but should not be used as a means of decoration, which would be an abuse of purpose. The work should be the product of thought and time, for smoothness and polish of surface would not supply the defects of hurried work and absence of thought.

Mr. C. F. A. VOYSEY, on the subject of domestic furniture, alluded to the prevalence of merely depending on upholsterers for furniture; display, gilding and veneer there was, but simplicity, repose, harmony and dignity were wanting. Much of this was due to the spirit of revivalism. Mankind was still very much in a monkey stage, mocking and mimicking old and new work, good and bad. Commercialism also offered its rewards all round to the best mimics. Many, however, though not artistically trained, happily had revolted against the tawdry pretentiousness of the bulk of modern furniture, and encouraged the reproduction of old and simple furniture that had been designed with intelligence to meet human needs, and were not the outcome of any spirit of revivalism. It was clear, therefore, there must be a logical basis for design of furniture. But all must be impressed with the present utter want of harmony between furniture and architecture—except in jerry buildings. Still, he thought, there was hope, for there were signs of change in a right direction and a widespread feeling that simplicity would lead to truer richness. The carver, metal-worker, &c., should exercise restraint. Concentration of ornament to hide cheap construction, bad workmanship and material, must be avoided. Elaboration covered a multitude of sins, and he would add virtues also, as was apparent in the deadly dullness of the design of the bulk of modern inlay, which destroyed the beauty of the wood into which it was put. The paper concluded by condemning all in the way of mechanical reproductions, and advocated the cultivation of creative faculty. However faulty the work of the designers, if only conscientious it would be interesting, and not as now a funeral procession of dead styles.

Mr. ALDAM HEATON read a paper on "The Theory of Hangings." He observed at the outset that he should confine himself entirely to the practical side of the question. The word "hangings" came, he believed, from the Mediæval house, with its tapestry hangings, and had got transferred to pasting on walls paper that did not hang. Without entering on the subject of tapestry, Mr. Heaton gave an exhaustive description of fabric for hangings, &c. These as a rule should be fairly dense in texture, and in their nature suggestive of warmth and protection; they must be firm and not flaccid, and must go into good folds, the character of the folds being a matter of primary importance. The use of cotton fabrics he condemned, for cotton deteriorated most fabrics utterly, and made one suspicious of the rest. Wool he placed first in importance, including also goat's and camel's hair, the woollen process producing softness and sense of warmth, and the worsted process firmness, crispness and springiness. Silk came next, but was used in general only as a facing, being backed up by other material. Incidentally it was mentioned that so fine was the filament that a thread reaching from London to Edinburgh could be sent by post for 2*d*. After cotton came linen and jute, the latter producing a fairly respectable velvet. Dyes faded in cotton, except in the case of Turkey red and indigo blue, far more quickly than was the case with silk or wool. Serges and flannelling fabrics gathered dirt more quickly and looked shabby sooner than worsted and wool. For purposes of utility jute was probably a more useful fibre than cotton. Tapestry, embroidery and crewel-work were out of reach of most on account of cost, and here damask weaving came to the rescue of the multitude, but for sake of cheapness there were temptations to swamp it with cotton. Mr. Heaton then proceeded to speak of velvet, praising the old examples, and condemning what is now fashionable and known as plushett, though German worsted velvet with admixture of goat's hair was a useful and beautiful fabric. Proceeding to speak of chintzes,

Mr. W. WOODWARD, rising to order, asked what the subject had to do with architecture?

The PRESIDENT replied the subject before them was furniture.

In concluding his remarks, Mr. Heaton gave the following lists under headings good and bad of available drapery materials in order of merit and demerit, viz. good : old tapestry, twills, satins, &c., made from long wool or goat's hair, woollen cloth, silk fabrics if firm, oriental tent coverings, velvet of wool and mohair, camlet and moreen, and woollen serge if on a worsted warp ; bad : cotton velvet, low art serge on cotton warp, soft cotton fabrics and silk plush. The paper then finished with a reference to church hangings.

Mr. W. D. CARÖE, on the subject of church furniture, remarked that many churches in this country were not worthy of their purpose and especially were shoddy in respect of furniture. The architects of the churches ought to have been consulted as to the furniture and fittings of the churches. The architect too often was not consulted in these matters, for instance as to hangings, brasswork, embroideries, &c., and worst of all not consulted when an organ was to be introduced into an old or a new church. Mr. Caröe entirely condemned one specialty of pseudo-Gothic, viz. pitch-pine. If economy demanded its use it should be untouched and unvarnished, and thus, its grossness of texture being toned down, in a few years would be unnoticed. The prevalence of the use of pitch-pine was a curious problem. Some doubted if an edifice could claim to be Gothic without. He, however, would do without it or use it according to his rule ; if it must be varnished, he would say stain it. Early English and geometrical woodwork only seemed worth study from an archaeological point of view, modern designs in these styles being general failures. Nothing, however, to his mind, was more harmonious and beautiful than much of the German, French and English work in which Renaissance detail was grafted on Gothic ideas, though Sir Frederick Leighton had condemned the lack of restraint to be found in much of the later German woodwork. The *cinqe cento* and later woodwork of Italian churches had much to tell of perfect harmony with Gothic forms as seen in modern designs. There was also a field for study in French and Flemish work of the sixteenth and seventeenth centuries. Mr. Caröe concluded his paper by referring to the responsibilities and opportunities of the modern organ builder as to the external appearance and fitness of their work. It was no exaggeration to say that when let loose in a church the organ builder, speaking generically, was the veritable bull in a china shop.

Mr. ALMA-TADEMA proposed a vote of thanks to the authors of the various papers. Some one, he said, had told him not to spend so much time in putting cabbages and furniture in his pictures. He had not, however, changed his ways. To live in houses with bare walls would not do. It was necessary to have seats to sit on, tables at which to eat, various articles in which to put things away in. He would not be too hard on any one because he preferred one particular style to another. Any style he would allow so long as the application was suitable to our actual wants. There was no new form to be invented, though it could be suggested. The present period of civilisation embraced all periods of the past. Every one was free to think as he liked, and there was certainly a great diversity of thought. Some thirty years ago a friend of his had called archaeology the handmaiden of science, and if he might say so, it was also the handmaiden of art. Speaking historically of furniture, he said the most ancient seat we knew was the Egyptian—hollow, extremely comfortable to sit in and very low. The Greeks and Babylonians had a higher and a square seat. From the Romans Mr. Tadema adverted to the Americans, and then came to our seats of the present day. He praised the Chippendale period as one of the finest in regard of furniture. It must have been a clever architect to have done so well, or if he was an upholsterer he had shown himself to be an architect. Architects should study how to give us comfort in houses, churches, &c.

Lord EGERTON OF TATTON seconded the vote of thanks. He said he had had opportunities of seeing furniture in most parts of the world and could confirm what Mr. Alma-Tadema had said, that some of the oldest seats were the most comfortable. He had sat in the marble seat in the theatre of Athens, on which was inscribed the name of the ancient high priest. He thought there was much to be learnt from the ancients in regard of comfort in furniture. In the present day there was the custom of imitating every kind of furniture, and the latest craze was Japanese work ; excellent as Japanese work was, the beautiful examples of furniture abroad should not be neglected, especially the work in Italy. The stalls and fittings of choirs and churches in Italy he believed were more worthy of study than in any other country. The Italians were doing a good work in publishing monthly details of all the best furniture and fittings. The cost was only two or three shillings, and it included full-sized working drawings, plates, illustrations, &c.

Mr. L. KNOWLES, M.P. for West Salford, considered that rectors should not have the power over churches that they possessed. What made matters worse, the rector had to consult the rectorial sisters, aunts, &c. A reredos would be handed over to the village monumental man, the roof to the

village carpenter, and all the bad work would be credited to an architect.

Mr. W. WOODWARD, speaking purely from the architectural point of view, said he would distinguish between the architectural finish of a house and its furniture.

[A person present, whose name did not transpire, during the course of Mr. Woodward's remarks rose to order, and asked what those remarks had to do with furniture. No reply being made, Mr. Woodward continued, and, on the same person rising again to order, the President gave his opinion that Mr. Woodward was not out of order.]

Mr. WOODWARD contended that architects could not do justice to clients if they were to undertake to design chairs, wall-papers, &c. He had an easy chair he sat in all day, but it had not been designed by an architect. He praised the designs of Mr. A. Welby Pugin, which were exhibited.

Mr. J. R. CLAYTON referred to his personal friendship with Mr. Pugin, who designed with great rapidity and in a singularly condensed way.

Mr. J. D. CRACE also referred to the excellence of Mr. Pugin's drawings.

Mr. W. AUMONIER, as an example of what should not be followed, referred to the crude designs shown at the last Arts and Crafts Exhibition, and deprecated any falling back on the babyhood of art.

The PRESIDENT, in putting the vote of thanks to the meeting, coupled with the names of the readers of the papers those who had lent drawings, fabrics, metalwork, &c., that night for exhibition, mentioning among other names those of Mr. Pearson, Mr. Norman Shaw, Mr. W. K. Shirley, Mr. James Brooks, Mr. Crace, the South Kensington authorities, &c.

The vote of thanks was passed by acclamation. Mr. John Belcher replied in acknowledgment, and the meeting was adjourned.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE Peeblesshire residence of Sir Charles Tennant, known as The Glen, was visited on Saturday by the members of the Edinburgh Architectural Association. The mansion-house is in the valley of the Quair, the nearest railway station being at Innerleithen—Scott's St. Ronan's Well—and the five miles drive on by Traquair village and the old parish church, and skirting the hill with "The bush aboon Traquair," is an exceedingly pleasant one. The estate of The Glen stretches along the Quair valley for miles, and the house with its hilly environment and rugged cast of scenery might well call up the memories of the Highlands. In 1852 the estate came into the present proprietor's hands for about 33,000*l.* At that time an old mansion-house stood near the site of the edifice of to-day, and the land afforded a hard struggle for existence to some fifty families. Sir Charles, then Mr. Tennant, besides erecting a handsome residence, spent large sums of money in laying out the extensive grounds, and now from 150 to 200 families are attached to The Glen. Skilful management and liberal expenditure have made it one of the finest residential estates in Scotland. The major part of the present mansion-house was erected in 1854 from plans by the late David Bryce, architect, Edinburgh, and eighteen years later it was enlarged from designs by Mr. John Bryce. It is a stately Scottish baronial edifice, built from Swinton stone, and very elaborately decorated. With its towers and turrets, crow-stepped gables and quaint figures, the structure is a handsome pile, and has well earned the admiration of the many tourists who visit The Glen. Indoors comfort has been especially studied, and in this the architects have been eminently successful, so much so that in this respect the house is a typical country residence.

The members arrived at The Glen in the early part of the day. Mr. John Bryce, the architect, and Mr. T. Fairbairn, hon. secretary, were of the party. After a glance at the rural entrance lodge and the fine approach, a move was made for the house. Mr. George Herdman, estate factor, received the visitors, and the housekeeper, Miss Bruce, led the way over the mansion. The noble entrance hall panelled in oak and with a billiard-table, first attracted attention, and then a move was made to the drawing-room in the southern wing. The windows of this charming room command the Quair valley, looking its very best in the spring sunshine. A most elaborately decorated ceiling withdraws the eyes for a few moments from the pictures, which are the chief attraction. Sir Charles Tennant is well-known as a generous art patron, and in The Glen is stored a splendid collection of works in oil and water-colours. A landscape by Turner—*Forthill*—has a good position in the apartment and the Scottish Academician Ewbank's *South Shields Harbour* is nicely hung. There are fine examples of Creswick, Clarkson Stanfield, Roberts, Boughton, Topham and Lawrence. A boudoir opens off the drawing-room, and while the latter was dedicated for the most part to the English Academicians this bright little room has the walls covered with some of the best efforts of two of our Scottish artists. There are, for instance, from the brush of

W. E. Lockhart, *Burns's Funeral, The Auld Brig of Ayr*, and two views of Dumfries. More numerous even are the examples of the late Sam Bough, including such fine works as *Lincluden Abbey, Field of Bannockburn* and *Ellisland*. Clark Stanton and Barret are also represented. A visit to the library, with its oaken bookcases heavily laden, and an inspection of portraits of the Tennant family there hung, together with the truthful presentments of the Ettrick Shepherd, the author of the "Seasons" and the Laird of Abbotsford, was next followed by a survey of the dining-room. A splendid view is had from the windows of this large-sized room. The Fethan valley stretches before the eye, with Minch Moor in the distance, where the road winds to Innerleithen, and where the country residence is of Mr. Thorburn, M.P. for the county. As a foreground there is The Glen shrubbery, with the well-kept tennis-lawn close to the house, and the little rivulet of the Kilburn provided with sundry miniature cascades. This stream is better known as Lucy's Burn, associated with Laidlaw's touching ballad of "Lucy's Flitting," in which the old mansion-house is commemorated. Pictures again command notice, and on the walls of the dining-room are examples by Watts, Erskine, Nicol, Alexander Fraser and a pretty river scene from the brush of G. Paul Chalmers. Retracing their steps to the hall, the party next ascended by a fine oak staircase to the floor above. A framed certificate on the corridor wall shows that at the Royal Jubilee Manchester Exhibition Sir Charles Tennant had a splendid collection of his pictures out on loan. A charming little room—Miss Margot Tennant's boudoir—received a due meed of approbation. Sitting at the window a pleasant view is had of the terraced grounds, with the upper part of the Quair valley, and to the west the bracken-covered Birkhill. A bright wall-paper and a carpet of deep blue, flecked with white, make the room cheerful, and a little cottage piano has the post of honour. Books are everywhere. Scott's novels, Edgeworth and Sterne are authors easily noticed; and the much-talked-of novel "Robert Elsmere" is on the adjoining shelf to a complete edition of Fenimore Cooper. Several paintings and engravings are on the walls, including Sam Bough's *Aberdeen*. Near the boudoir are two airy rooms, formerly occupied as day and night nurseries, and now known as Miss Tennant's rooms. The latter—the bedroom—is a quaintly-furnished apartment provided with many curios, antique nick-nacks and old china, and in every corner and nook well-laden bookshelves, on which are a number of religious works. Old-time prints are on the walls—hunting scenes mostly; foxes' heads and brushes are artistically arranged, and there is an array of riding whips depending from hooks. Recesses are formed by turrets at two angles of the room, and one of the little circular enclosures with bare stone walls and diminutive stained-glass windows is fitted up with a prie dieu.

After a careful inspection had been given to the house, and the architectural features closely scanned, an ascent was made to the flagstaff tower, and a grand sweep of the landscape enjoyed. This concluded the indoors part of the proceedings, and a tour was next made through the magnificent domains of the gardener. On the way the extensive stables drew attention, and a small snuggerly or smoking-room of Mr. Edward Tennant's, which is so filled with preserved trophies of the chase that it resembles a museum, was visited. A walk through the hothouses, under the guidance of Mr. James M'Intyre, head gardener, was a pleasant experience. Mr. M'Intyre is well known as a successful exhibitor, and at the Edinburgh show recently he had a considerable share of the honours. Grapes, pines and strawberries were seen in various stages, and in the orchid house, for which The Glen is noted, there was a splendid show. Partly driving and partly walking, the Edinburgh visitors then had a glimpse of a portion of the demesne. Higher up the Quair valley an artificial loch of some ten or twelve acres extent has been constructed, with islands, and with a picturesque boathouse. A footpath leads from here over the hills to the Yarrow valley; and St. Mary's Loch, it may be mentioned, is by a hill path only two hours' walk from The Glen. Within easy reach of the mansion-house are the attractive residences of the factor, head-gardener and head-keeper, and there is a neat schoolhouse for the estate children, with dwelling-house attached for the schoolmistress. A well-appointed dairy is in the vicinity of the gardens, and a covered-in tennis-court has been erected nearer the lodge gate. There is a post-office established for the estate, and at present a telephone wire is being brought out from Innerleithen.

During the course of the visit lunch was served in a summer-house, and one of the members of the party, Mr. Balfour Paul, Lyon King of Arms, Edinburgh, proposed a vote of thanks to Sir Charles Tennant for having given them permission to go over The Glen, and to Mr. Bryce for the explanations he had furnished in regard to the building. Mr. Herdman briefly replied, and said he was quite certain that Sir Charles would, if at home, have been glad to have met them, and would be pleased to learn that they had had a pleasant visit.

THE GLASGOW RAID.

THE printsellers in Glasgow who were compelled by the chief constable to remove some photographic reproductions of modern pictures from their windows, having informed the artists of the circumstance, received the following replies:—

2 Holland Park Road, Kensington, W.:

April 17, 1894.

Dear Sirs,—I learn with surprise and regret, from your letter of the 12th inst., that Glasgow—alone, I think, among the large cities of Great Britain—still lags in the stage in which works, inspired simply by the desire to express the dignity and beauty of the noblest work of creation, the human form, awaken only suggestions of obscenity. This, however, cannot be dealt with from without, certainly not by action on the part of the artists who produce these works. Time alone and the increasing influence of the more enlightened among your citizens, who are no doubt many, can be looked to to bring about a more wholesome and, let me add, cleaner attitude of mind.—Yours faithfully,

FRED. LEIGHTON.

The Avenue, 67 Fulham Road, London, S.W.:

April 18, 1894.

Dear Sirs,—It seems rather strange that I should be asked whether I consider a picture which I have painted objectionable on the score of decency. If there were anything indecent in it I should not have painted it. As a matter of fact, there is nothing in the picture which is indecent, and it is simply as insulting as it is idiotic to suggest such a thing.—Yours truly,

E. J. POYNTER.

74 Fellowes Road, South Hampstead,

London, N.W. : April 14, 1894.

Dear Sirs,—I am astonished that a request to remove the prints you mention should have been made in Glasgow—a city considered here as the art centre of Scotland.

I quite agree the matter should be taken up, and have every confidence that you will have the support of every art dealer and artist in the kingdom.

It is impossible that such a narrow and ignorant command should be recognised as final.—Yours faithfully,

ARTHUR HACKER.

2 St. John's Wood Studio,
Marlborough Road Station, N.W.:

April 20, 1894.

Gentlemen,—I confess that the action of your chief-constable in suppressing the exhibition of the works you name has not changed my views on the nude in art.

The figure of Justice is generally clothed and always blindfolded, the sword (I blush to think of it) naked, and the scales empty.

From my earliest youth I wondered why she was sightless. The problem has been solved in Glasgow. I take it she may not see the difference (a not very subtle one) between the naked prostitute and the pure unconscious type of female beauty. It is almost time Justice began to see something.—I am, &c.,

SOLOMON J. SOLOMON.

Messrs. Connell & Sons have also received the following letter from Mr. Arthur Lucas, the publisher:—

31 New Bond Street, W., London:

April 19, 1894.

Gentlemen,—As you invite my opinion upon the question of the public exhibition of reproductions of paintings of the nude and semi-nude, I must confess that, coming as I do of a family of painters, and having been engaged throughout manhood in art publications, it is difficult for me to understand the attitude of the chief-constable of Glasgow in requesting you to remove from your window such works as *The Bath of Psyche, Diana and Endymion, A Visit to Æsculapius, Orpheus, The Judgment of Paris*, and *Syrinx*, all of them works of truest art and of the utmost purity. He must be a debased brute indeed to whom any one of these could suggest impurity. But there are nudes and nudes, and whilst I have nothing but admiration for works of the above order, there are many (almost invariably by foreign painters) in which the nude is introduced in such a way as to degrade art and to debase the spectator. I would have such painters publicly flogged by the common hangman, and the men who deal in their wares prosecuted as public nuisances.—I am, gentlemen, yours faithfully.

ARTHUR LUCAS.

Dr. J. Hopkinson, F.R.S., will deliver the second "James Forrest" lecture at the Institution of Civil Engineers on Thursday next. The subject will be "The Relation of Mathematics to Engineering."

DOORWAY IN THE CHURCH OF THE ROSARY, TERLIZZI.

THE doorway of the church in Terlizzi (Apulia) was, like the rest of the front of the building, covered with a thick coat of whitewash. The Italian Government ordered that the door should be revealed, and were rewarded by a remarkable example of sculpture. The ornament, it will be observed, runs around the sides and upper part of the door, and consequently the elements which compose it are turned in different directions

according to position. The curves of the branches are stiff, but the sculptor may have tried to imitate nature. The upper relief in the arch is probably the strangest representation of the Last Supper that has been carved. In order to display the viands, the table becomes a sort of arch, and the Apostles appear as busts placed on it. Apparently they are Normans. The frieze represents the Annunciation, Nativity and Crucifixion, and the whole sculpture may be considered to be the work of some primitive amateur, and probably he was a Norman soldier.



DOORWAY IN THE CHURCH OF THE ROSARY, TERLIZZI.
By Anselmo da Trani.

THE EXPLORATION OF SILCHESTER.

FOR something like fourteen centuries, says the *Daily News*, the site of the once-flourishing Roman city of Calleva, in North Hampshire, better known to latter times as Silchester, had remained practically undisturbed by those potent weapons of modern archaeological research, the spade and the pick, when the late rector of Strathfieldsaye began, in an irregular way, to dig, with results interesting in themselves and rich in promise of future discoveries. Since then, however, a Silchester Exploration Fund has been formed, and the Society of Antiquaries have taken up the task in a systematic fashion, mapping out the whole area, extending to more than 100 acres, within the ruined and ivy-clad walls and the surrounding fosse, into square divisions, called by them "insulae," and devoting themselves to the examination of these, one by one, in a way which promises to place us eventually in possession of all that the remains of this once-important city can teach regarding the domestic life of the Romans in these islands. Meanwhile, with a view to sustain interest in these labours, they have instituted in the Society's rooms at Burlington House an annual exhibition, of which the fourth of the series was opened to the public on April 24.

Fortunately for the explorers, the church and a farmhouse are now the only buildings to obstruct their operations within the area, and, with the exception of some acres of pasture, the whole is arable land. The fourth season's excavations were begun early in May, and carried on till October 19. It is of interest to note that out of the Society's modest income for the past year, 374*l.* went in wages to the diggers, numbering some forty men all told, who are mostly labourers from the neighbourhood. They may be seen wheeling their loaded barrows in the elaborate and beautiful coloured model of the recent operations prepared by Mr. G. E. Fox and his brother enthusiast, Mr. St. John Hope, which, next to the great plan hanging on the walls, will attract the attention of visitors. A curious feature about the site is that it forms an irregular polygon of sixteen sides—an unusual form for a Roman city; but Calleva is believed to have been the site of *Caer Segont*, the more ancient capital of the *Segontiaci*, who once inhabited this part of England, and it may be that the Roman occupiers found its present configuration ready to their hands. The drought, by hardening the land, proved last summer a serious hindrance, but nearly nine acres were nevertheless explored, and much brought under observation. One condition, at least, is fortunate. Roman London is found at 16 to 20 feet below the present surface of the City, but the ground floors of the Roman buildings in Silchester are, as a rule, at a depth of little more than a foot or a foot and a half. It is not supposed that this once-flourishing centre of Roman life suffered anything like sudden destruction. In digging at War Bank, near Keston, Kent—supposed to be the site of a suburb of the great Roman city of *Novio Magus*—and elsewhere, unmistakable evidences of destruction by fire—the probable work of Saxon or Scandinavian invaders—have been found; but the tokens revealed so far at Silchester suggest that the ancient city simply decayed after the decline of the Roman power—shrank by degrees somewhat as *Winchelsea* has shrunk in later times, then became a village, and ultimately faded out—for the modern village of Silchester is some half-mile distant. The peculiar and most interesting feature of last year's operations was the light that they tend to throw upon the form and arrangement of the two distinct types of Roman dwellings—one known as the "courtyard," the other as the "corridor" type. In the division marked on the great wall-map as *Insula VIII.*, an unusually perfect house of the "courtyard" type was uncovered and a model of it made before it was covered in again; for it is to be observed that the covering-in process, though laborious and costly, is deemed to be the best for preservation. The "courtyard" style, as will be expected, was the more luxurious and important. It generally consisted of three sides, around which the various buildings were arranged. Adjoining to this unusually perfect model of a "courtyard" house is another house of the corridor kind. This is simply a long house consisting of a row of chambers, with a corridor on either side. These buildings flank the main street of the city, which passes straight from north to south. All the streets, indeed, are laid out in this Roman fashion, direct from point to point. This reminds us that the great drought of last season was not entirely a misfortune; for the consequent withering of the clover and vegetation along its course led to the discovery of a hitherto unnoted street, running from the north wall to the south wall of the city, and forming the eastern boundary of *Insula VIII.* Even learned antiquarians have been apt to forget that differences of climate necessarily led to essential changes in the form and arrangements of Roman dwellings. The houses in Britain and in northern Gaul were, indeed, entirely different in their arrangements from those of *Pompeii* and the countries skirting the Mediterranean. Our Roman masters shivered in our east winds and hated our damp atmosphere. Hence their dwellings here were more closed in, and had, as a rule, no

great peristyles or open atria. In *Pompeii* hardly an instance has been found of means for warming houses. In Silchester, on the contrary, there was scarcely a room without a "hypocaust" under its floor, with an adjoining furnace in which charcoal was burnt, the heat thus generated and stored being thence circulated through the walls by means of fireproof flues formed of brick and tile.

Within the area of the present explorations is the Forum and Basilica, with the adjoining baths; also a circular temple with its adjoining small enclosure, supposed to have been a temporary "pen" for victims. The amphitheatre, which measures fifty yards by forty, stands at some 150 yards outside the north-east gate. Though now overgrown with trees, its double entrances and five ascending ranges of seats are still readily distinguished. The antiquities found last year, though not so numerous as those of the previous season—a circumstance attributed to the unusual hardness of the soil—include many objects in bronze, iron, bone, glass, and even wood. Several important architectural remains were also discovered, among which is an absolutely unique object found in a pit—being the greater part of a "stele," or turned pillar, bearing a legible monumental inscription in the ancient "ogham" characters. On this find Professor Rhys will doubtless have something to say. Hitherto no ogham inscription has been discovered east of Devonshire or the river Severn. The occurrence of this unexpected and undoubted example so far east as the Duke of Wellington's estate at Strathfieldsaye has occasioned a flutter in the western wing of Burlington House, which only perhaps an earnest member of the Society of Antiquaries can fully appreciate. The general collection of Silchester objects which will be on view next week is very considerable. They include coins—from those of *Vespasian* to those of *Honorius*, which recalls the fact that according to *Nennius* it was in the time of *Honorius*—that is, early in the fifth century—that the so-called "Usurper" *Constantine* was crowned in Calleva, where, according to an old local tradition, either he or his son *Constans* sowed three grains of wheat within the walls which had the mysterious virtue of protecting the inhabitants against poverty. Gold coins of the Celtic type have ere now been discovered at Silchester; also many inscriptions, among which is a fragment of an altar, "To *Hercules* of the *Segontiaci*." For the rest, the finds have mostly consisted of seals, rings, glass and personal ornaments, mosaic flooring, and so forth. A noteworthy object shown on Saturday was a curious squat earthenware bottle, belonging to the latest stratum of relics. It is in shape like two very large circular buns, placed flat-side to flat-side, and having in the centre of one of the convex sides a very short neck. A tiny perforation near by fulfils the obvious purpose of the spigot hole in a barrel. Altogether about thirty-six out of the hundred acres have now been excavated and planned, from which it will be seen that the Society have yet some years of hard, and we trust fruitful, work before them.

THE FREE CLASSIC REVIVAL OF 1870-80.*

(Concluded from last week)

SUCH were the beginnings of modern Queen Anne. From small school edifices it developed into an harmonious and well-defined type of domestic building—very different in its letter from the stiff and starched appearance of its prototypes, being marked by breadth and freedom of treatment and in many cases by great richness of detail. The movement for an improved architecture was not confined to England; the architects of the United States soon caught their enthusiasm, and the Centennial Exhibition of 1876 served to intensify the feeling of patriotism. If Queen Anne architecture were dear to Englishmen, it was reasoned, it should be doubly so to us. In England the history of architecture could be traced back for centuries. In the United States the case was different. The early colonists landed in America while Jacobean architecture was at its best, but they could give little thought to style or details; protection from the elements and savage foes were the first requirements. Later, when they could give more attention to architecture as an art, Queen Anne ruled the popular taste and our colonial mansions were built and decorated under the influences that surrounded the thought and literature of the time.

Queen Anne or Early Georgian is therefore our starting-point in architectural history. It has been well to revive a taste for its quaint and home-like character, not merely for its own sake, but as a stepping-stone to something better and more enduring for the future.

Let us now briefly glance at the various constructive features embraced in what has thus been outlined as Queen Anne architecture.

* An address by Mr. George C. Mason, jun., delivered at the Architectural School of the University of Pennsylvania, and published in *Architecture and Building*.

Construction.—In the Renaissance of Palladian detail and Dutch brickwork welded together as the principal factors of Free Classic we can distinctly trace the influence of three systems of construction.

1. In dignity, as in age, stands the cottage or Old English style, claiming descent from the heavy Tudor mansions of rough stone, unhewn timber and white concrete filling, usually termed "magpie work," from the startling contrast between their white panels and tarred timbers. Of these old mansions numerous examples still remain; they were, for the most part, erected during the fifteenth and sixteenth centuries, but in some instances a much earlier date may be assigned them. Their construction is of the most substantial character and consists in great part of oak framework of large scantling, tenoned and pinned together, the spaces between the timbers being filled flush both sides with a composition of well-beaten clay, straw and chalk, which has become almost as hard as stone. Imbedded in the composition are stout oak laths held in position by cross sticks, to which they are bound by hazel withes, no nails being used in any part of the work.

2. Queen Anne proper, founded on the houses of Holland and the Netherlands; a thoroughly appropriate system of construction for a country where brick is the vernacular building material, and one which, perhaps, of all others, is the most easily adapted to the requirements of city streets, with but little width for the façades and with lofty gables to give additional storeys to meet the various needs of traffic and domestic life.

3. The style without a name, but which in the early years of the Renaissance gathered to itself a heterogeneous mass of details, both insular and continental, combined with a picturesque grouping of parts to form a well-defined and pleasing whole. This later phase may well be called "Free," but as it appears to be simply a stepping-stone to something better and is still in process of amalgamation and expansion, I propose to call it the Victorian Transition.

The originators of modern Queen Anne were all men trained in the Gothic school and their watchword was "true construction." This term seems to be the most elastic and enduring of all the rules of architecture. It is, however, applied mostly to the works of a revival period, and is frequently used in advocacy of new methods and in condemnation of the old.

The architects of the Victorian Gothic school had had it impressed upon their minds by the teachings of Pugin, Eastlake and others, that true construction did not exist after the Middle Ages; the period of massive timber framing, heavy tables, mantel trees and settles, put together with wooden pins and disdaining all curves and wavy lines. For a time these professors of artistic truth were implicitly believed, and architects came to look upon stucco, plastering, glue, veneers, broken pediments and applied ornamentation as monstrous emanations from diseased brains, bewildered and carried off their balance by the great upheaval of the Renaissance. The rapidity with which a change in sentiment was achieved is one of the most remarkable instances in architectural history. The worshippers of "savagery" and all the elegant diction of the "Seven Lamps," the plaster ornament breakers of 1860, became ten years later the loyal subjects of Queen Anne, accepting without question the tenets of Stuart and Revett, the Adam Brothers and even of Nash and Wyatt, who carried the extravagance of applied ornament to its utmost limit.

In studying the constructive features of the Queen Anne Renaissance we find many examples of richly ornamented façades, combined with an affected picturesqueness and quaintness unthought of two hundred years ago. How are we to account for this change in favour of greater richness and profusion of detail in a professed revival of the pure and simple forms of the past, and for the well-established fact that modern Queen Anne brickwork owes much of its effectiveness to the teachings of an earlier school—that of the Tudors?

Art brickwork as we find it used in English architecture is not simply an outgrowth of the Dutch school introduced on the accession of William of Orange. For centuries it had been employed with success, particularly in Norfolk and other "brick districts." Under the Tudor sovereigns moulded and carved brickwork attained a high standard. The buildings erected under their rule were frequently enriched with delicately-carved and wrought string moulds, gable ends, chimneys, cornices, sharp in outline, crisp and spirited in detail. Even under the Stuarts, Inigo Jones and his great successor, Wren, executed some noble works in this material. Unfortunately for art, Parliament in 1625 established the rectangular dimensions of bricks, which thenceforth were moulded in one dreary pattern, a block of burnt clay 9 by 4 by 2½ inches. In 1784 Parliament again interfered and levied heavy taxes upon all bricks modelled, whether such bricks were spoiled in the burning or not. This tax was in its action almost prohibitory of any attempt at establishing a high grade of workmanship. In the long interval between 1625 and the repeal of the tax in 1850 workmen in clay forgot their cunning and all desire for improvement had come to a standstill. The Victorian Gothicists made strenuous efforts to reform so dis-

creditable a state of things, and, after struggling for years against the conservatism of brick masters and the ignorance of labour, attained their ends. Thus, when the School Board Act of 1870 was passed, it found them ready with trained mechanics at their command. The opportunity was not lost and the new Queen Anne was born. In 1850 the revival and expansion of that style would have been impossible. In 1870 the building world was ripe for the change. The architects themselves, after receiving their early education under the leaders of the stucco and plaster school of the Georges, had become purified and refined by the art teachings of the Gothicists. The result was a spontaneous movement to develop a new system of construction with lintelled openings and square fenestration—Queen Anne modified and elevated by Mediaeval traditions. A transitional manner, but a sensible one; a sudden fashion; if you will, a craze; but it is a monument which will be looked back upon with satisfaction, as a bold and successful step toward the solution of the great problem of domestic architecture, how to make every man's home his proper dwelling—how to combine Sir Henry Wotton's three conditions of the art of well building, "commodity, firmness and delight."

Esthetic Qualities.—Having thus followed Queen Anne architecture through the various phases of its development, it but remains to refer to its claims to artistic excellence, and answer, if possible, the question so frequently heard ten years ago, "Is Queen Anne high art?"

Two thousand years ago Vitruvius laid down the following rules as the basis of good architecture:—First, order, method and regularity. Second, fitness of arrangement, general disposition and contrivances adapted to locality and other circumstances. Third, uniformity. Fourth, proportion, being the relation of parts or quantities, by which harmony and grace are obtained. Fifth, character, which dictates the special aspect of the work according to its purpose. Sixth, analogy, consisting in those resemblances and ideal significances which assimilate the works of man to those of nature. Seventh, economy, not merely the vulgar economy of the purse, but that which combines utility with beauty, admitting nothing superfluous and allowing nothing to be overlooked.

Sir Henry Wotton tells us in the quaint language of his day that "in architecture, as in all other operative arts, the end is to build well." Other writers have alluded to architecture as the "politeness of building" and as "the art of building with expression." Nothing, however, so happily expresses the fundamental law which should govern the preparation of an architectural design as these words of Roscoe:—"Utility and beauty are bound together in an indissoluble chain, and what the great Author of nature has joined together, let no man put asunder."

Will the Free Classic of the Queen Anne reformers bear the test of a critical comparison with the "Seven Lamps" of Vitruvius, or the elegant diction of Roscoe? Are such designs true exponents of "high art," and will they meet the requirements of modern life and its complex and artificial conditions?

We have seen that the United States received their colonial methods of building direct from England, but here the connection ceases, except in sentiment. If we compare a number of designs for English and American country houses, with their accompanying plans, we will, I think, discover that in reviving a taste for Queen Anne composition the architects of the two countries have adopted different ideals as to the inception and development of their eclectic systems. The Englishman, naturally conservative, clings rigidly to his first ideas of domestic planning, and, although varied and often enriched in detail, the exteriors of his Queen Anne houses are in most instances simply reflections of earlier works designed for the School Board of London. The planning of their houses is irregular in the extreme, symmetry and balance of parts is ignored, and the communications between the various apartments complicated and often tortuous. Their long and narrow corridors, and the infrequent use of the furnace or steam coil, as a means for procuring an equable diffusion of heat, supplemented by open fireplaces, necessitates the screening of doors by placing them in out-of-the-way angles to prevent draughts. The humid climate of England renders the verandah objectionable, and the windows, rarely fitted for blinds, are grouped together and divided by light and graceful mullions—a relic of Tudor practice.

The American architect started to perfect his revival with less precedent and conservatism to contend with. He could therefore adopt any system he pleased, or, by combining several styles, compose a thoroughly eclectic design. Truth compels the confession that he took full advantage of his opportunities, and his Free Classic became free indeed.

No style of domestic architecture can be good or partake of high art qualities that cannot be claimed as a true exponent of the family and social life of the period to which it owes its birth and development. A whimsical fashion in dress, in equipages, or in the etiquette of society can be tolerated without injury to national advancement. Such fashions are transitory, springing suddenly into notice and as rapidly passing

into disuse. With architecture it is different. Her follies are wrought in durable form. We see an ultra Queen Anne house erected during the height of the revival period, and its quaintness and odd conceits attract our notice and perhaps enlist our passing commendation. If we live in it we put up with its soon apparent incongruities, and for a time all goes well. But, when we tire of four by four-inch fenestration, glazed with rough cathedral glass; with the lines of the quaint tower, several inches off the vertical, and bulged in the centre of its height, to give the effect of age; with the rough and, at first sight, massive walls, of lath and plaster, glittering with broken glass; with ceilings so low that we are unable to fit our rooms with chandeliers, and thus diffuse a proper light over apartments rendered gloomy with artificially darkened walls and panelling, what are we to do? If the house is well built, it should be in better heart and condition one hundred years hence than the colonial mansions erected prior to 1760 are to-day. These colonial mansions, built and furnished for the wealthy merchants of the seaboard towns, may well command our admiration and careful study. As a rule, they are entirely unfit for the domestic life of to-day, and their construction is faulty and badly designed when viewed in the light of the best modern practice. They should, however, be studied, because they are true exponents of art building, in that they show in every line and moulding good common sense—the use of materials according to the best ability and knowledge possessed by the artisans who erected them, and a sturdy manhood which wrought by main strength artistic works out of the crude materials and slender mechanical appliances of the colonists. A study of these old mansions seems to lay before us something of the mental strength of the men who erected them—men who were fully up to and even ahead of their time, and who aimed to do their best, and what they did was good. Such being the case, are we to suppose that had the colonial architects and builders continued in practice down to our own times, they would have gone on in the old way, or rather behind their own best period of construction? To revive, under the title of “Queen Anne,” and to meet a popular fad in the last quarter of the nineteenth century, the hewing out of huge beams with an axe, leaving them as large as possible to reduce manual labour to a minimum? No; they were too advanced in sentiment for such weakness, and would, no doubt, have developed by steady growth a sensible and correct national style of domestic building, founded upon colonial precedents; but taking into consideration all the advances in science and art, and above all in machinery, which, although frequently decried by “high art” amateurs, has done more to improve the art and science of American building than all else besides.

The advanced Queen Anne designer of the early revival period took a different stand and used different arguments. He told us in all seriousness and with much enthusiasm that the domestic building of the colonists was far in advance of modern work in homelike comfort as well as in picturesque aspect. He pointed to the huge beams and hanging knees which support their floor, the rudely chamfered edges doubled into shape with an axe, as evidences of the care and skilful manipulation of the workman. He called upon us to admire the hand-made sashes, with muntins an inch and a half in width, glazed with rough and greenish glass; the mouldings, all hand-made, showing all the wavy lines and irregular sections inseparable from hand-work, and then triumphantly asked, “Can your boasted machinery turn out such work as that?” I answer, emphatically, No, it cannot; and for this we should be thankful. Would such men as the colonial builders, whose best work is their monument, have spent their time in hewing out beams of oak 10 or 12 inches square by main strength and patience, if they had possessed the circular saw driven by steam power? The weight of these huge beams, of badly-proportioned section, forced to support a surplus of width with comparatively slight depth, wrought serious injury to the building of which they formed a part, settling floors, hollowing roofs and ridge lines and doing far more than time in rendering these old mansions picturesque suggestions for a revival of “high art.”

Thus we have followed the revival of 1870, its gradual development and culmination about 1880; and now, twelve years later, our architects begin to feel that the sound common sense that underlies the mental nature of our people is encouraging the growth of true art culture. This feeling reacts upon our architects, and with better educational facilities than any of the men of middle age have ever possessed, we are moving out on truer and more deeply laid plans for the improvement and development of our national architecture. So far we have had in this country no fixed standards by which the educated architect could be tried and his professional position established. Unlike the practice of law and medicine, the field has been free to all, and previous training not required. The establishment of architectural schools at the Massachusetts Institute of Technology, at Columbia College, at Cornell University, at Champagne, Illinois, and within the last four years at our own University, with well-trained and enthusiastic professors at the head of each, with carefully selected assist-

ants, is already doing much toward an improvement in students and in raising the standard of our architects in the eyes of society. This student system must in time create a body of men well trained, enthusiastic, and bound together with an *esprit de corps* hitherto unknown among the great body of practising architects. The dictum passed by such a body upon questions relating to their art will be received with respect by the laymen who employ them, and our American architecture will thus receive an impetus and acquire a nervous strength in construction and composition which at present we find exemplified only in the works of a few highly-trained—generally self-trained—practitioners.

The Queen Anne revival, viewed apart from the incongruities that became engrafted upon it, has proved a movement of great interest to the profession. Although adopting a worn-out and debased art as the foundation on which to erect their eclectic system, the revival has given to us in the works of its best masters much that is beautiful and honest in theory, and added to real domestic comfort. To Americans, Queen Anne or Early Georgian is the starting-point in architectural history. Let us then accept the position, and aim to emulate the old masters in their endeavours to do the best with the small means at their command. Let us build strongly, honestly and conveniently, eclectically, if we will, and our nineteenth-century architecture, developed from and founded upon Queen Anne, will realise the ideal of Skelton, who tells of the early masters who, centuries before the advent of Queen Anne or Free Classic architecture, were—

Building royally
Their mansions curiously,
With turrets and with toures,
With halls and with boures
Stretching to the starres;
With glass windows and barres;
Hanging about the walls
Clothes of golde and palles,
Arras of rich arraye,
Freshe as flowres in Maye.

GLASGOW BUILDING TRADES' EXCHANGE.

A GENERAL meeting of the members of the recently formed Building Trades' Exchange for the city and district of Glasgow has been held, for the purpose of considering the report of the committee appointed to draw up a scheme for the organisation of the Exchange. Mr. Andrew Gray, who presided, said it was very gratifying that the matter of the Exchange had been gone into so actively, and he was glad to see present representatives from the architects, measurers and builders in the city. They wished to have the hearty co-operation of all connected with the building trade, as the Exchange was intended to assist all connected with the trade. He had not the slightest hesitation in saying that he believed that before long they would have one of the best Building Exchanges in the world, not even excepting any of the flourishing exchanges in America. The report regarding the organisation of the Exchange was then submitted. The Association is to have a capital of 10,000*l.*, divided into 1,000 shares of 10*l.* each, and the membership is to be of a corporate and non-corporate character. There is to be an executive council of twenty-one members. The report was adopted, and Mr. W. M. Cunningham was elected secretary, and Sir William Arrol president. Various committees, including those on arbitration and education, have to be appointed.

THE BATH PUMP-ROOM ANNEXE.

AT last week's meeting of the baths committee of the Town Council the proposal for the erection of an annexe to the Pump-room was considered. Mr. J. M. Brydon, the successful competitor, produced two plans which he had prepared. These were lettered respectively “A” and “B.” “A” provided for a promenade-room running in the same direction as the existing Pump-room, that is, from Stall Street towards the abbey, with additional offices, the whole to cost 19,000*l.* The “B” plan provides a promenade-room running from the direction of Cheap Street towards York Street, the dimensions being 60 feet by 40 feet. On the right hand of the entrance from the churchyard ladies and attendants' rooms and a parlour would be arranged, while on the left there would be cloak-rooms and a smoking-room for gentlemen. Down each side a kind of corridor would run, ending in a terrace at the southern end overlooking the present Roman baths, which would be covered by a single-span roof, the elevation of the whole being the same as the existing Queen's Bath. Care would be taken not to interfere with any of the Roman remains, while the building itself would be 37 feet from the abbey at the nearest point. For the purpose of this plan it would be necessary to pull down

Mr. Moody Davis's premises, but the further half of the block would not be needed. The corridors would have low roofs, but the promenade-roof would form a dome. The cost of "B" plan would be just under 20,000*l*.

It was moved that the plans should be left at the Guildhall for further inspection by the members of the committee, and that Mr. Brydon draw up a description which might be printed and circulated amongst the members.

An amendment was proposed by the Mayor, and seconded by the ex-Mayor, that the committee recommend the "B" plans to the Council for acceptance.

After discussion the amendment was withdrawn and the original motion carried.

SIR SIMON PRESTON'S HOUSE, EDINBURGH.

A TABLET with the following inscription has been placed on the wall on the west side of the entrance to the Royal Exchange, Edinburgh:—"On this site stood the mansion of Sir Simon Preston of Craigmillar, provost of the city of Edinburgh, 1566-67, in which mansion Mary Queen of Scotland, after her surrender to the Confederate Lords at Carberry Hill, spent her last night in Edinburgh, June 15, 1567. On the following evening she was conveyed to Holyrood, and thereafter to Lochleven Castle as a State prisoner." This tablet, marking the site of so interesting a tenement associated with Queen Mary's history, has been erected as the outcome of a motion made in the Town Council last year by Dean of Guild Miller, who has since greatly interested himself in the matter. In his researches the Dean has had the benefit of the antiquarian knowledge of Mr. Peter Miller, one of the ex-bailies of the city, who has drawn up a memorandum on the subject, founded largely on a scrutiny of the sasines or title-deeds of the property in this locality. In this document Mr. Miller says:—"That the house occupied by Sir Simon Preston, provost of the city in 1566-67, when Queen Mary was lodged in his house, was on the north side of the High Street, forment the Cross, is proved by the letter, written the day after the occurrence took place, of J. Beaton, brother of the Archbishop of Glasgow, wherein, among other incidents related concerning Queen Mary at that time, he says:—'The Lords brocht her Majestie to town, quhair they arryvit at 10 hours. They logit her Majestie in the Provost's lodging, forment the Cross, upon the north side of the gait.' (See Laing's 'History of Scotland,' third edition, 1819, appendix page 109.) Sir Simon Preston was provost of the city of Edinburgh at that time. Sir Simon Preston's family owned the mansion at the Cross from 1493 till after Queen Mary's time. The house was some time afterwards sold to Alexander Mauchan, advocate, and it was sold subsequently by his heirs to Walter Stewart, writer, of Ballachtoul. The exact site of the house of Sir Simon Preston is ascertained from Edgar's map of 1753, before the Royal Exchange was built, as it shows all the closes in that locality. The Ordnance Survey of the locality in 1859, which shows the lower ends of Stewart's and Pearson's Closes, also supplies us with evidence by which it can be determined, on the line of the High Street, where the closes named open on that street. From the sasines referred to, it appears that there were two tenements between Alexander King's Close and the west side of Preston's mansion, and that mansion was bounded on the east by Preston's Close, afterwards named Stewart's Close, and that close formed the west boundary of Alexander Pearson's house. From these it is shown that Preston's mansion stood on the west of Stewart's Close. The survey plans show that Stewart's Close opened on the High Street, where the entrance to the Exchange now is, so that Preston's house stood partly on the entrance to the Exchange and partly to the west of it."



Fireproof Construction.

SIR,—Some short time ago there appeared in one of the building papers a letter from a northern architect to the effect that "Some little time previously he had constructed a mill or factory on the latest fireproof principles. Some time afterwards he received an intimation that the mill was on fire, and in a very short space of time it was burned to the ground, although it was supposed to be fireproof."

It is a well-known fact that in buildings of this description, although the floors are to all intents and purposes fireproof, as soon as the columns and main girders which carry the same get red-hot, they bend or buckle under the weight they have to carry and let down the lot, roof as well, into the furnace which is burning beneath. I thought a good deal about this

matter at the time the letter appeared, but could not then see my way clear to answering the same; but now I am in a position to do so, and take this opportunity through the medium of your paper of announcing, for the benefit of this gentleman, as well as others whom it may concern, that I have obtained provisional protection for an invention by the use of which neither the columns, main girders, or floors can either bend or buckle, even when subjected to the most intense heat, thus making buildings fireproof beyond all doubt. I have many details and improvements which will be included in my complete specification, but in the meantime, in the interests of the public, I am willing to give architects and others (bona-fide) an opportunity of at least considering my invention.—Yours faithfully,

CIVIL ENGINEER.

32 Lydford Road, Maida Hill, W.

GENERAL.

Members of the Architectural Association are informed that through some misunderstanding the Westminster Town Hall is not available for the Architectural Association *soirée* on May 4, but that the Holborn Town Hall has been taken for the performance of the play for that date.

An Exhibition of works of past and present students of the City and Guilds of London School of Technical Art, established in Kennington Park Road in 1879, will be held in the hall of the Skinners' Company, Dowgate Hill, from May 1 to May 9. The exhibition will include works of sculpture, modelling, engraving, drawing, painting, design, house decoration, wood engraving, &c.

The Paisley Burns Statue Committee have requested the following sculptors to send in models for a statue of Robert Burns, to be erected in Paisley, at a cost of 1,300*l*.:—Messrs. John Tweed, F. W. Pomeroy, R. W. Colton, Wade, Whitehead, and Charles H. Allen, London; W. Birnie Rhind, W. G. Stevenson and George Webster, Edinburgh; Kellack Browne and William Sheriff, Glasgow.

A "Pig" of Roman Lead has been found on the moors near Matlock. It weighs about 170 lbs., has an inscription on its upper face, and in all respects agrees with the numerous other pigs of Roman lead found in various parts of Britain. The inscription, divested of ligatures, is P·RVBRI·ABASCANTI·METALLI·LVTVDARES, or "(the lead of) P. Rubrius Abascantus, of the Lutudarensian mine." Abascantus may be supposed to be the lessee of the mines, which were State property by Roman law.

The Surveyors' Institution will meet on Monday, April 30, when a paper will be read by Mr. Harold Griffin, entitled, "Weekly Property as an Investment." The annual dinner will take place at the Holborn Restaurant (Venetian Room), on Monday, May 28, at half-past six.

The Liverpool Architectural Society hold their annual general meeting on Monday, May 7, when the officers and council for the forty-seventh session will be elected, Mr. Henry Hartley being nominated for re-election as president.

An Anonymous Donor, who has been defraying the cost of the restoration of the battlements and clerestory of Kidderminster parish church, has decided to undertake the restoration of the tower, which will be recased with stone under the superintendence of Mr. J. A. Chatwin, architect, of Birmingham. This will entail a cost of several thousand pounds additional to the amount involved for the work already undertaken.

Mr. A. E. Cokayne, of Ilkeston, died suddenly on Tuesday night. He was the author of a comprehensive history of Haddon Hall, and was collaborator with the Duchess of Rutland in her literary work. Mr. Cokayne was an authority on heraldry.

Mr. S. S. Stanley gave an address on "Church Bells" at the annual meeting of the Warwickshire Archaeologists' Field Club just held.

The Royal Society of British Artists have elected the following members, viz. Messrs. Robert Christie, Reginald Machell, E. H. Read, Montague Smyth, Frank Spenlove Spenlove and Holland Tringham.

Mr. Herbert R. Lloyd read a paper on "A Group of Worcestershire Houses" at the Midland Arts Club, Birmingham, which was illustrated by lantern slides, shown by Mr. R. K. Dent. Many views of sixteenth and seventeenth-century half-timbered houses were shown.

The Nineteenth-Century Art Society have settled on Tuesday, May 1, for the reception of works of art intended for the Summer Exhibition (the thirty-second) at the Conduit Street Galleries.

The Members of the Carlisle Architectural, Engineering and Surveying Association have just held their third annual dinner and smoking concert at the Coffee House Hotel, Mr. Higginson, architect, president of the association, in the chair. There was a very large gathering, including several visitors.

The Architect.

THE WEEK.

THE appointment of Mr. E. J. POYNTER, R.A., to succeed Sir F. W. BURTON as Director of the National Gallery will give general satisfaction. It is preferable to confide so important a post to an artist rather than to an amateur or even an officer of engineers. Mr. POYNTER, by his *Israel in Egypt* (which is now an attraction in the Guildhall Gallery), *Atalanta's Race*, *Stoning of St. Stephen*, *A Visit to Esculapius*, *Meeting of Solomon and the Queen of Sheba* and other paintings, has demonstrated that he knows more about past life than is to be derived from historical primers. His lectures also are evidence that he has carefully studied the histories of all the schools of art. Mr. POYNTER, therefore, may be considered as having prepared himself for his present position by an effectual course. A German would say it is better to undergo training as an assistant, and afterwards to have charge of small galleries, before undertaking the responsibilities attached to the directorship of the most important collection in a State; but there are advantages in possessing the technical knowledge which is not obtainable in a bureau. Mr. POYNTER's association with South Kensington does not accredit him with the public, but as he always acted in an independent manner and endeavoured to minimise the evil effects of the departmental system, it would be an error to suppose that he became degenerated, like so many artists who had accepted official positions. Mr. POYNTER is the son of the late AMBROSE POYNTER, architect, who was associated with the organisation of the schools of design, and was a pioneer in the endeavours to overcome the indifference to art which prevailed among manufacturers and others.

THIS year's exhibition of the Royal Academy will not be memorable on account of one work, but it is likely to be attractive. There are nudities enough to tempt the Glasgow bailies to invade Burlington House and vindicate the cause of morality. In one instance the presentation of the undraped model is to be excused. By some odd attraction plain men have a wish to be represented by Mr. HERKOMER, and having painted so many portraits of them, it is natural he should for relief wish to paint a figure which was not concealed by black clothes, and did not suggest wealth. As Sir J. E. MILLAIS is absent, Mr. FILDES has obtained a chance to become the fashionable portraitist. His likeness of the Princess of WALES is so successful as alone to warrant a claim on that position. The immense example of decoration for a Boston library by Mr. SARGENT is the largest and most obtrusive example that has appeared in Burlington House. Another novelty is Mr. A. GOODWIN's celestial cathedral in blue, for which his water-colour drawing of Mont St. Michel in the Society's room was evidently one of the studies. It is as remarkable as any of JOHN MARTIN's attempts. The picture is only one of many colour experiments in the exhibition, and this year colour rather than form claims interest. In the sculpture-room Mr. GILBERT's design for the tomb of the Duke of CLARENCE will excite interest.

THE name of the Belgian painter, ERNEST SLINGINEYER, who has just died in Brussels in his seventy-first year, was almost unknown to the frequenters of modern exhibitions. Although he retained a large studio, he rarely worked in it of late years. M. SLINGINEYER married a baroness some years ago, and he gave up art for politics. As a representative he was always eager to serve art in Parliament, and from time to time he delivered eloquent speeches in its support. He was well qualified to become a minister of art, but we believe he never held office. M. SLINGINEYER was a pupil of WAPPERS, and was so precocious that he was able to produce his colossal picture of the "Vengeur" myth, which many consider to be his masterpiece, before he attained his twentieth year. His aspirations were towards monumental art, and the majority of his paintings could only be hung in public buildings. M. SLINGINEYER believed

in tragedy; hence battle scenes or catastrophes like the Destruction of Pompeii were his favourite subjects. When GALLAIT, DE KEYSER, and others of his countrymen, instead of epic themes, produced pictures of historical episodes, M. SLINGINEYER's style became old-fashioned; in reality, people found it was not pleasure to attempt to realise his subjects, while his rivals never attempted anything which the simplest could not enjoy. To many of the Belgians he seemed to be a successor of DAVID, whose theories and practice belonged to a sort of prehistoric age. His later contemporaries preferred anecdotes on canvas, while he painted history in the style of men who were accepted as great masters. Fortunately for him his activities were turned into a new direction. He retained a hankering after art, and it was not agreeable when he visited his studio to be surrounded by immense pictures which no Government would purchase; but the indifference did not make him bitter towards the younger school, and he spoke of contemporary painters with admiration, although they did not care to become his imitators.

STUDENTS of French Gothic and all who propose to undertake a journey in the French provinces will find it an advantage to possess the new number of the American *Architectural Record*. Among the contents is a chronological summary of the French cathedrals prepared by Mr. BARR FERREE and arranged in tabular form. About sixty years ago DE CAUMONT introduced summaries in his "Histoire," which was a *résumé* of a course of lectures delivered in Caen, and in 1843 the Abbé BOURASSÉ compiled a table for his book on the cathedrals; Mr. BARR FERREE's table is far more elaborate than the earlier attempts. He is not satisfied with giving particulars of the buildings which are at the present time accepted as cathedrals, but includes also churches which formerly were used as cathedrals, ruined cathedrals, temporary cathedrals, and churches which replaced former cathedrals. As a consequence, the number of buildings of which records are given is increased. The Abbé BOURASSÉ notices eighty-one buildings, while Mr. BARR FERREE has two hundred. The former employs six periods. Mr. FERREE describes the work executed in each century, an arrangement which required far more labour. The tables will be found most useful, not only to tourists, but as a chronological guide to one important class of buildings.

THE insertion of an architect's name in a prospectus may henceforth be taken as evidence that he was architect to the company in spite of other evidence to the contrary. That is the moral to be drawn from the judgment given by Mr. Justice WRIGHT in *CREWE & SPRAGUE v. Brixton Theatre Company, Limited*. The plaintiffs claimed that in November 1892 they were retained by the defendants to prepare the plans and procure tenders for the structure, which was to cost 13,000*l*. This work was done in due course, but in December the company dismissed the plaintiffs, as alleged, from their engagement, and engaged Mr. FRANK MATCHAM. The defence substantially was that the plaintiffs did the work for one BLACKMORE, and not at the request of or for the company, which was not incorporated at the time. The learned Judge, however, held that as the names of the plaintiffs were inserted in the prospectus as architects, and there was a paragraph stating what arrangements the company had made with them, in his opinion, although the plaintiffs could not establish the whole of their claim, yet they were entitled to something for their plans, and he suggested a settlement. The company had, it appears, made no use whatever of the plans, nor had they seen them. As it was found impossible to arrive at terms, his lordship gave judgment for the plaintiffs for fifty guineas with costs. The amount claimed was 1,000*l*.

THE award in the competition for the proposed meat market in Bradford Street and Cheapside, Birmingham, has been given by Mr. MURGATROYD, of Manchester, who was appointed as judge. The design by Messrs. ESSEX, NICOL & GOODMAN has been selected, Messrs. COSSINS & PEACOCK's design obtains second prize, and the third prize is awarded to Messrs. BATEMAN's design.

ARCHITECTURE AT THE ROYAL ACADEMY.

THE visitor to the Architectural Room is likely to be surprised at first by the exceptional largeness of several of the drawings. There are, however, others which are unusually small, and as a result the average number of drawings is attained. The names of many of the exhibitors are familiar, but this year some appear for the first time in the catalogue. London, as usual, holds possession of the larger part of the wall space, but Leicester, Chester, Bolton, Manchester, Liverpool, Brighton, Exeter, Gloucester, Harrogate, Kettering, Cardiff, Llandaff, Reading, Edinburgh, Glasgow, Douglas (Isle of Man), &c., have a share of it. The collection has, therefore, some claim to be considered as representative.

It may be inferred from the drawings that English Renaissance and Flemish continue to be esteemed as the most fitting styles for secular buildings, and that churches are generally Gothic of a somewhat elastic species. But there are signs of a slight agitation which may be interpreted as a preliminary to a nearer approach towards Italian. If clients were sufficiently courageous to pass the threshold of the room, it is not unlikely that many of them would be fascinated not only with the decoration in graffito of a house in Lisbon, by Mr. FORMILLI, but with the character of the house itself, and Scotsmen would conclude that, as the faceted masonry shown in the lower part was also to be seen in Crichton Castle, it deserved to be adopted for their London houses. There are also drawings of additions and alterations to buildings, like those which are seen in the "Vitruvius Britannicus," that men who contemplate building would consider as having a stateliness and repose which are not attainable in styles that allow the different parts to enter into competition with each other for prominence. Jardine Hall, Dumfries, and Wickham Hall, the former being entrusted to Mr. E. J. MAY, and the latter to Mr. W. MILLARD, are examples of old-fashioned houses which should not be considered as of obsolete types.

Domestic work is in the ascendant this year. The demand for picturesque country houses is suggested by the number which appear on one of the very large drawings by Mr. A. B. MITCHELL. There are also examples by Mr. H. O. CRESSWELL, Mr. HARRISON, Mr. E. A. HILL, Mr. CUTLER, Mr. V. T. JONES, Mr. W. COLES, Mr. H. FIELD, Mr. B. CHAMPNEYS, Mr. A. VIGERS, Mr. GUY DAWBER, Mr. REDFERN, Mr. BEDINGFIELD, Mr. M. H. B. SCOTT, Mr. W. T. WALKER, Mr. E. P. WARREN, Mr. A. GIBSON, Mr. A. N. PRENTICE, Mr. P. M. HORDER, Messrs. NIVEN & WIGGLESWORTH, Mr. L. J. WILLIAMS, Mr. R. A. BRIGGS, Mr. J. BROOKE, Mr. P. WATERHOUSE and Mr. A. M. POYNTER. They are of a class which can be attained without imposing onerous sacrifices on the owners, and deserve to be prized as homes. The smallest and cheapest reveals an endeavour to avoid the commonplace, while retaining a type that will not be wanting in simplicity.

There are large country houses, such as Welburn Hall, Kirbymoore-side, by Messrs. DEMAINE & BRIERLEY, which, among other effective parts, has an open arcade or approach on one side, laid out on a curved plan; Motcombe, Dorset, and North Mymms, by Messrs. ERNEST GEORGE & PETO, which might be taken for excerpts from "Nash's Mansions"; Ashcroft, by Mr. W. F. UNSWORTH; Culford Hall, which has more of an Italian character than is common now; Athelhampton Hall, with its ancient garden, by Mr. INIGO THOMAS; Endall's Manor, by Mr. BELCHER; the interiors of Hurstbourne, Hants, having elaborate woodwork; Elm Bank, Kettering, by Messrs. GOTCH & SAUNDERS; Abbot's Leigh, by Mr. F. C. LEES; Test Court, Chilbolton, arranged to form three sides of a court, &c. The majority of those mansions may be accepted as English in character and as consistent in details.

The town houses are more varied. The buildings in Norfolk Street and Arundel Street by Mr. JOHN DUNN, in which terra-cotta is largely used, would be more appreciated if placed in wider streets, and they have an air of prosperity that befits them as offices. The proposed new premises in Kingsland, by Mr. C. V. JOHNSON, correspond with other examples in the room in showing strong arching over the shop windows, by means of which the upper storeys will not appear to be carried by a signboard and a sheet of plate-glass. The Conservative Clubhouse, Glasgow, by Mr.

EDIS, is Scottish to a slight extent, for the upper part is not quite so plain as the remainder of the elevation. The houses in the Melbury Road, by Mr. H. RICARDO, have more of the Old Court suburb style about them than many others in the road. Mr. C. F. HAYWARD's row of mansions opposite the British Museum is in red brick, with stone dressings, and the storeys are well adapted for flats. A terrace at Stoke Newington, by Messrs. BOOTH & ANDERSON, we suppose is also intended for several tenants besides the shopkeepers, if we may judge from the proportion of window openings to solid parts. The immense windows seen in the upper floors of Mr. IVOR PRICE's houses in Cannon Street, Dover, we suppose became necessary because the rooms are likely to be used for business purposes. Mr. J. J. STEVENSON's Porches were worth special representation, for modern houses are too often considered to be worth attention only on account of the general effect. Mr. H. HUNTLY GORDON's Offices for the Ocean Accident Guarantee Corporation are almost unique in the exhibition, as they are an adaptation of Gothic, but the windows are ample.

Two of the designs for the buildings in Bath are shown. Mr. BRYDON's additions to the Pump Room are more satisfactory in the interior view, for the pair of façades, with their pediments and columns, appear to be merely stuck on the principal front. Messrs. BAGGALLAY & BRISTOWE's treatment of the great Roman bath is interesting from its Classical character, and the introduction of figures on the piers would increase the effect. The Homœopathic Hospital, by Mr. W. A. PITE, is a plain but well-proportioned brick building, and patients should be grateful for the avoidance of a flight of steps to the entrance. The design for the Walsall Town Hall, by the same architect, we imagine, was not appreciated because of the number of doors which lead to the balcony. The Municipal Buildings, Rotherham, by Mr. LOVELL, has the advantage of distinctly suggesting the different departments. The Public Offices and Technical Institute, Leyton, by Mr. TULLOCH; the Victoria Institute, Worcester, by Messrs. SIMPSON & ALLEN (shown in five views); the Northampton Institute, Clerkenwell, by Mr. MOUNTFORD, are characteristic examples of the buildings that now find favour with committees. A building such as Mr. HORSLEY proposes for the St. Helen's Technical Institute, or that by Mr. JEMMETT for the Darlington Municipal Buildings, runs the risk of not being adequately appreciated. If the Gower Street front of University College, London, can be completed by Professor ROGER SMITH, as it appears in Mr. BREWER's drawing, the dismal street will be improved. Another scheme for improvement is seen in Mr. STATHAM's courageous study for remodelling the front block of the National Gallery by raising and altering the dome and introducing copies of the campaniles of St. Paul's. The gain would, however, be not worth the labour; WILKINS's work cannot be mended, and it is wiser to let it stand as a sort of gauge to determine the progress of architecture in London. The new P. & O. Offices, Leadenhall Street, are an excellent example of Mr. COLLICUTT's town buildings, but we trust the panels under the windows which display the stages of ship-building will not suffer at the hands of mischievous boys. Buildings for education are not numerous. It is interesting to compare the designs for the choir schools of Magdalen College, Oxford, which were prepared by two Associates, Sir A. W. BLOMFIELD and Mr. G. F. BODLEY, and opinions will differ about which is the more successful. Expense apparently was against Mr. BODLEY. The Collegiate Buildings at Ampleforth, by Mr. BERNARD SMITH, and some anonymous co-operator, recall WELBY PUGIN's treatment not only in design but in the manner of getting up the drawing. The premiated design for Harringay Board School, by Mr. BUTLER, corresponds with the normal type for the Metropolis. Mr. E. B. LAMB's small art school is rather quaint, but storeys can be added without much inconvenience. The South-Eastern Agricultural College at Wye, by Mr. P. B. CHAMBERS, is a long low L-shaped building—a sort of continuous cottage that is better adapted for use than a lofty building. Mr. FAIRLEY's drawing of the Board School at Armadale, West Lothian, was lately reproduced in this Journal. Mr. ROBSON's Ashton Grammar School, Dunstable, is a compact block, a chapel-like hall forming the central part.

WATER-COLOUR SOCIETY.

"SUMMER EXHIBITION" may be interpreted as applying not merely to the season, but to the character of the drawings which are now to be seen in the room of the Water-Colour Society. With one or two exceptions everything relating to winter has been kept out, and as the majority of the drawings are of native subjects, the exhibition therefore testifies to the beauty which is still to be seen in England. On that account more delight can be derived from what is presented in the room than from much larger exhibitions.

As in most other places where modern art appears, it becomes evident in the Pall Mall Gallery that the spirit of innovation [is trying to assert itself. There are little

which have taken place. It is no longer supposed that water-colour drawings are cabinet gems which cannot be examined too closely. They have now to assert their power in large rooms or galleries against backgrounds which are deep in colour, and in proximity to *bric-à-brac* of a variety of materials. As a consequence, not only are drawings turned out on a larger scale, but they are manipulated in a manner that will "tell" at a distance. The paper is operated on to an extent that would appear incomprehensible to DAVID COX, and he was supposed to go to extremes in the employment of coarse grounds, and the colours are applied of a thickness that will bear measurement. In any exhibition the experiments which have for object the extension of the art would appear



SUNDOWN AND THISTLEDOWN.—TOM LLOYD.



WHITEHALL.—H. M. MARSHALL.

drawings of flowers which WILLIAM HUNT would have enjoyed, and on the walls, as well as on the screens, there are examples which seem inspired by an old-fashioned spirit. Among the artists who are mentioned by THACKERAY in the article on the Gallery, which appeared half a century ago, there is only one survivor, viz. Mr. G. D. FRIPP, but PROUT, BENTLEY, TAYLOR, CATTERMOLLE, NASH, OAKLEY, WRIGHT and FIELDING would be able to say their influence has not entirely come to an end. Nevertheless, they could hardly help expressing astonishment if they were able to see the extent of the changes

remarkable, but in a gallery where the traditions of a more simple and quiet treatment are respected they become astonishing. Old and new methods are so successfully exemplified, it is not easy to be a partisan of either side.

Roman scenes would now seem to be indispensable in every exhibition. Mr. BULLEID's *Morning Greeting*, a girl asleep on a couch with a child kissing her hair, is tender in spirit. The details of architecture and of the inlaid couch are carefully treated. It is not easy to express marble in water-colours, and the artist has therefore introduced drapery to protect the panels. Red and brown are the dominant

colours. Mr. RADFORD probably comes nearer the reality when in his *Puellula Mala* he represents a little Roman vixen—it may be the child of a slave—who has torn a crimson robe, and does not appear to be contrite for the misdeed when complaint is made against her. The two drawings are more solidly painted than Mr. T. R. WEGUELIN'S *Battle of Flowers*, which is indefinite in detail, and might be only a study for a picture. He has discovered an interesting subject in *Venetian Gold*, which represents the trouble which ladies endured in dying their hair in Venice.

sand from the shore—is one of his happiest compositions. The *Chapel of the Sangreal* is a decorative piece by Sir E. BURNE-JONES; the three knights are attended by three angels, and there are also three angels adoring in the chapel. It is difficult to persist in the production of mystical figures throughout the year without becoming mechanical. It is no wonder that in the drawing before us neither mortal nor celestial beings appear to have any sincerity in their devotion. They are probably more suited for church decoration on that account. The difference between lacka-



MARKET, SEVILLE.—BIRKET FOSTER.



EVENING.—T. R. LAMONT.

The *Canephora*, by Miss PHILLOTT, is a graceful figure of a girl carrying a basket of flowers, who is placed against a wall of coarse masonry, as if to suggest the origin of the caryatids. The *Beadsman*, by Mr. WAINWRIGHT, is another of those large heads of monks he prefers, and shows his usual vigour. Mrs. ALLINGHAM'S *In the Garden* is apparently a portrait, and is preferable to many that are supposed to be more observant of the laws of the art. Mr. J. PARKER'S *Sand for the Floors*—French girls removing

daisical and genuine religious emotion will be apparent from a comparison of the drawing with Mr. HENSHALL'S *Gethsemane*, which is as impressive as any of the ancient versions of the scene. But there is no scope in England for talent which can vivify scripture scenes. If we could imagine Mr. HUGHES'S *Trifles of this Sort* to represent a young member of the Sheffield trade expounding the mysteries of an ill-shaped cruet and "plate" to his bride, without any suspicion of the vulgarity of the theme, the success of the drawing would

be unquestionable, and the technical execution merits the position it has been awarded in the room. But it is an insult to the memory of one of the best beloved of English writers to identify the scene with ELIA and his cousin BRIDGET. CHARLES LAMB was gifted with exquisite taste, and he was not likely to go into raptures over hideous table-knives and other appliances for the dining-table. If Mr. HUGHES condescended to read the essay from which he professes to have taken an extract, he would have found that ELIA, who was no longer young, describes himself and his cousin as rejoicing over a "set of extraordinary old blue china," but he is like the majority of English artists, and cannot conceal the weakness of his knowledge. It may be the picture was ordered by some Sheffield manufacturer, whose productions it represents, and who is eager to see it placed amidst the RUSKIN collection. Mr. GLINDONI'S *A Ward in Chancery* is neither better nor worse than a great many of his drawings, in which probability is sacrificed in order to "make the unskilful laugh." It is a pity so much skill in drawing and in suggesting character is not turned to better account.

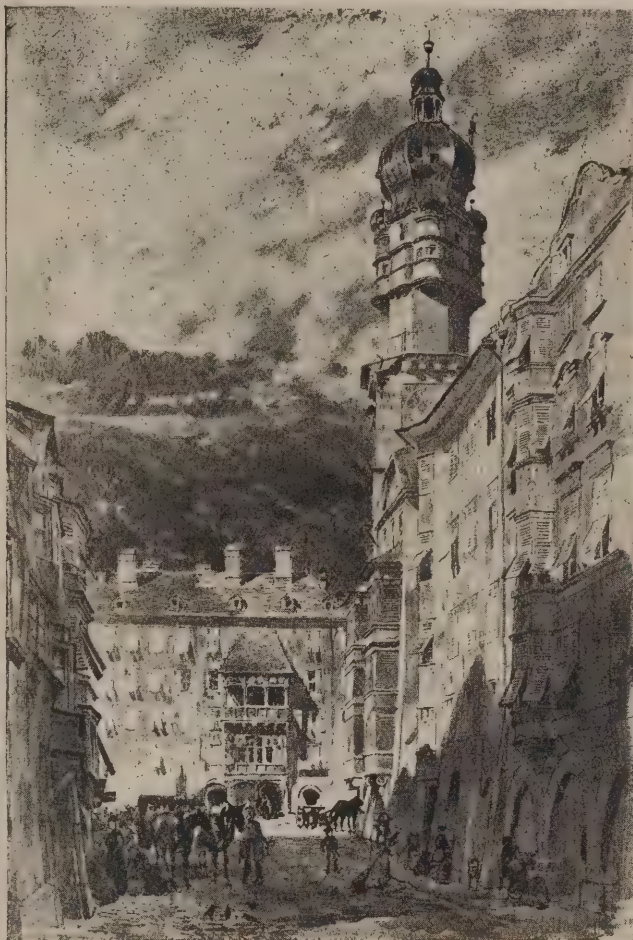
There are several pictures in which the figures, although only subservient, are not exactly puppets like those which CLAUDE said he gave away with the landscape. Mr. TOM LLOYD has imparted a touch of pathos to his *Desolate and Oppressed*, although the man and woman, who are tramps, recall other pictures. The figures in *Sundown* and *Thistledown* also are old acquaintances, and so are the river, punt and bank, but the whole is so well put together that, in spite of its bad position, the drawing was among the first to find a purchaser. *Mecca Pilgrims Returning to Cairo* is one of those combinations of Eastern architecture and figures by Mr. CARL HAAG which never become monotonous. The painstaking execution may be considered as out of date by those who admire Mr. A. MELVILLE'S *Tangiers*, which is undoubtedly clever, although the figures are like impressions

on bad blotting-paper of sketches or of figures in a better style, as they appear at an immense distance. Mr. R. W. ALLAN has made a name with similar efforts to express remote appearances, but Mr. MELVILLE'S are on a larger scale. The figures in Mr. BIRKET FOSTER'S *Market* may be strangely like Surrey girls, but how effectively they place themselves in their positions! Neither PHILLIP, LONG nor BURGESS have formed better groups, and the buildings, which are as commonplace as if they were erected by a

County Council, are rendered with a fidelity that must have been painful to a hand that was only accustomed to depict rose-covered cottages. Eighteenth-century formalism has inspired Mr. LAMONT'S *Evening*. If we can accept SHAKESPEARE'S authority, bowling was one of the games in which ladies could take part from the time of RICHARD II.

Landscape is the pursuit of the majority of the members. Mr. H. M. MARSHALL gives views from Dordrecht and Edinburgh, but most of his drawings are, as usual, derived from London. We do not quarrel with him for suggesting that buildings can be elastic at the desire of an artist, but there is no use in suggesting that Sahara would be a region of calm and serene air if compared with a London street. Hereafter it will be supposed that we were enveloped in an atmosphere that was copper-coloured and palpable. Mr. NORTH, A.R.A., in his *And so the ever-running year follows*, recognises that vegetation is not always brown, but Mr. EYRE WALKER is more faithful to the old belief. Mr. W. CALLOW'S *Château d'Amboise* lies rather low,

but he suggests the fine colour of the old masonry. Sir F. POWELL'S *Calm* is a seascape, for which the title is no misnomer. Mr. A. GOODWIN'S *Whitby Abbey* is one of the best views of a favourite subject, but the red light that darts from the sky is so intense that one imagines it must be a sort of symbol of something unknown. Mr. ROOKE'S *Mont St. Michel* shows the noble building above the roofs of the houses, but the contrast is too violent. We prefer it to



INNSBRUCK.—S. J. HODSON.



CHÂTEAU D'AMBOISE.—W. CALLOW.

Mr. A. GOODWIN's view, in which the abbey is seen through blue glasses. Mr. C. GREGORY's *New Winchester* is capital, and more charming than the title suggests. Mr. E. A. GOODALL's *Bay of Naples* is an attractive rendering of a subject that is almost hackneyed. Mr. HENRY's *Head Wind* will make many visitors long to escape from town, for the waves are not appalling to landsmen. Mr. HODSON's architectural scenes grow in interest. This year he gives two drawings of Innsbruck, one a street view, which is taken in the right direction; the other the so-called Maximilian tomb, with the rows of princes of the House of HAPSBURG. Numerous as are the views of Niagara, it may be doubted whether one representing the place "after long drought" was drawn before Mr. A. W. HUNT made the attempt. Mr. S. P. JACKSON has an impressive view of *Bamborough Castle*. Mr. W. CRANE has among his drawings one showing the *Approach to the Chapter-house, Wells*, which does not do justice to the peculiar steps. There are many other drawings which are deserving of the attention of visitors, and on the whole the exhibition can be considered as having more than the average amount of interesting works.

THE MOROSINI PALACE, VENICE.

THE palace in the Campo San Stefano which belonged to the naval commander and doge, Francesco Morosini, who lived in the seventeenth century, has been the subject of litigation. According to the *Scotsman*, the last heir in a direct line died in 1887 intestate. The claims of twenty-one heirs, chiefly Germans and Hungarians (for the Morosinis had married into the royal house of Hungary), to succeed to the palace and its precious contents were, after a long law suit, admitted. In 1889 they threatened to bring the property to the hammer, whilst the syndic of Venice and the other authorities were anxious to secure it, so as to preserve it intact as a specimen of a doge's house, and a show-place which would add still further to the attractions of their unique city. The city is not rich enough to buy it, but the authorities have succeeded in holding from off it the sacrilegious hands of the spoilers during these past four years. A month ago it seemed as if they were to be beaten. At last the heirs were to have their booty and the palace was to be broken up. A paragraph has been going the round of some of the English journals that June would bring round the auction day, and there was foundation for the report. However, its hour of peril has been its hour of victory. Count Morosini, who is descended from another branch of the family, has stepped into the breach. He has bought the palace and all its contents. At present he lives in the well-known palace on the Grand Canal, the Ca d'Oro. That palace has just been bought by Baron Franchetti. Probably he intends to live in it himself, and Count Morosini will flit to his newly-bought property in Campo San Stefano. It is understood he has already agreed to the request of the municipality, and will open the unique palace on certain days to the inspection of visitors, so that the travelling public as well as Venice may be congratulated on the happy termination of the question of this old doge's palace, which has remained to this day exactly as Peloponnesiacs left it. It is crammed full from floor to ceiling of all things rich and rare—things having an intrinsic value, but in many cases a greater historic one. Such, for example, are the *fanales*, or lanterns, hung on the walls of the great entrance-hall, which were taken from the ships Morosini commanded, and which show in order every grade of command he held, from that of a petty officer to commander of the fleet. Spoils of his Turkish wars decorate every room, and pictures by Titian and by other masters, and by Longhi, the Hogarth of Venice.

TESSERÆ.

Conventional and Imitative Art.

DECORATIVE art, as exhibited in its latest examples—such as the artistic cretonnes, the delicate wall-papers and encaustic tiles which the new æsthetic revival is making familiar to us all—depends for its effect almost entirely on immediate sensuous gratifications, though these are often of a comparatively high order. It gives us abundant visual stimulation by its pure and exquisite colours harmoniously combined, by its pleasant alternations of light and shade, by its novel tints curiously sought out and effectively disposed. It yields us the highest pleasure of form in its graceful, flowing and continuous curves; in its lissom sprays of straggling foliage, which nevertheless lead on the eyes unresistingly through their most natural muscular sweep; and in its symmetrical disposition of fruit and flower and animal form. But in its purest and most evolved types it never attempts directly to imitate nature. At

most, it takes a hint from some natural object, which it conventionalises, as we say—that is, renders in symmetrical arrangement and artificial colouring. Its sole object is to give us the largest possible amount of sensuous pleasure by means of colour, simple or combined; and of form, sinuous or symmetrical. If it imitates nature, it does so only incidentally, and it owes nothing to the accuracy of the imitation. Imitative art, on the other hand, may incidentally afford us similar sensuous pleasures, but in its most developed types it has shown a tendency to rely more and more upon the exclusively intellectual and emotional factors of æsthetic feeling. It takes some object in external nature, and endeavours to represent it on a plane surface, in colour, in chiaroscuro and in perspective. It tries to set the scene before our eyes as nearly as possible in its true lineaments, its actual relations, its total visible aspect. The whole growth of artistic technique has been the perfectioning of this process. From the single plane of the Egyptians and the floating background of the Chinese, art has advanced to the scientific perspective of the present European style. From the primary colours of the savage and the brilliant hues of the Mediæval artists, it has arrived at the comparatively sombre delineations of modern landscape painters. In doing so it has become from day to day less decorative and more imitative. It has to a great extent given up the attempt to please us by bright primaries, by gilding, by symmetrical arrangement, by curves and wave-lines not to be found in nature. It has largely abandoned the purely sensuous gratifications, except so far as these may be really found in the objects which it copies; and it has learned to rely on the intellectual pleasure of skilful imitation, combined to a slight extent with plot-interest and sundry complex emotional feelings.

Lysippus the Sculptor.

Lysippus was a native of the city of Sicyon, in the Peloponnesus, and flourished about 324 B.C. He was at first a worker in brass, but afterwards devoted himself to statuary, studying nature, by the advice of Eupompus, rather than following the manner of any master. He excelled all those who had preceded him in the nicety of any individual parts, and more particularly in the beauty of the hair. He lessened the size of the head, which had been exaggerated by the ancient sculptors, and made the body more slim so as to increase the appearance of the height. He used to say that former sculptors represented men as they were, whilst he made them as they appeared to be. His reputation was such that his name was included in the famous edict published by Alexander, when he conferred on Apelles the sole right of painting his form, on Lysippus that of executing it in bronze, and on Pyrgoteles that of engraving it on precious stones. He is said (Plin. xxxiv. 7) to have produced 1,500 works of art, any one of which was sufficient to stamp him as a man of talent. Of these we can only mention a few of the most celebrated. There was one at Rome, the removal of which from the Baths of Agrippa to the palace of the emperor, by order of Tiberius, had nearly caused a sedition. The populace clamoured for its being replaced, and Tiberius did not deem it prudent to deny their request. It was a statue called Apoxyomenos, representing, as its name implies, a man scraping himself in the bath with a strigilis, an instrument to clean the body of the particles of sweat. He executed many statues of Alexander, representing him at different periods of his life; and he so managed that a slight bend of the head, for which Alexander was remarkable, became rather a beauty than a deformity. One of these statues was so much admired by Nero that he caused it to be covered with gold, to the great grief of all true lovers of the art of sculpture. He executed a very fine bronze statue of Cupid with a bow, for the inhabitants of Thespis; also equestrian statues of twenty-five Macedonians who fell at the passage of the Granicus, and which Metellus caused to be transported to Rome. It has been supposed, though without any clear proof, that the celebrated horses of Venice formed part of this group. There is a statue of Hercules in the Palazzo Pitti at Florence, which bears his name, and has in every respect a strong resemblance to the Farnese Hercules, excepting the position of the legs. This likewise has made it be supposed that the statue of the Palazzo Pitti is a copy of the Hercules of Lysippus, and that the Farnese is an imitation on which Glycon thought he might engrave his name, on account of the change he had made in its position. Lysippus had as pupils his own sons, Dahippus, Bedas and Euthycrates (Plin. xxxiv. 8).

Greek Vases.

Greek vases may be divided into five periods, assigning approximate dates of antiquity, as follows:—First archaic period, previous to the eighth century B.C.; second archaic period, from the eighth to the seventh B.C.; third archaic period, from the seventh to the sixth B.C.; fourth, the finest period, from the sixth to the fourth B.C.; fifth, the decadence, from the fourth to the second B.C. The peculiar characteristics of each period are as follows:—The first archaic period: of these, the earliest

specimens of Greek fictile art, most are discovered at Athens, Corinth, Melos, Camirus in Rhodes, and Etruria. They are very rude, painted in reddish brown or black, on ash-coloured ground, with chevrons, concentric circles, stars, &c., and primitive representations of men and animals. The vases of the second archaic period are abundantly supplied from Camirus in Rhodes, as well as other parts of Greece. They show a great improvement in the drawing of the figures; they are usually of cream-coloured clay, painted with crimson and white, and red on black, the details being scratched with a point, the style of ornamentation being two or more rows of animals (real or imaginary), of birds, harpies, sphinxes, &c. In the third archaic period are found the most valuable Greek vases, of a more artistic character than those which precede it. The figures are painted in black, on a red ground, and the designs are confined to a square tablet between the two handles, the rest of the vase being painted a lustrous black. Mythological and heroic subjects are now introduced, and complicated groups of figures, chariots and occasionally inscriptions. The fourth is the best period of Greek art. These vases may be especially distinguished by the design being left red, the ground filled in with black, and the details of costume, features and anatomical delineations produced by black lines. Sometimes are found black figures on red and red figures on black on the same vase. This may be considered a transition from the archaic to the more artistic style. The fine vases of Nola may also be attributed to this period. The fifth period may be called the decadence, and dates from the accession of Alexander the Great, B.C. 336 to B.C. 186, when it is presumed the fabrication of painted vases altogether ceased, shortly after the edict of the Roman senate against the celebration of the bacchanalian festivals in that year.

Chinese Bricks.

It is certainly not for want of materials that the Chinese have not already acquired a fame for architecture, as probably no country in the world could show a greater amount of building or could surpass it in abundance and excellence of material fit for building purposes, which are similar to those commonly used by other nations, namely, bricks, timber and hewn stones; of the first named there are several descriptions, each being suited to a particular purpose; for instance, to construct massive walls such as the walls of their cities bricks a cubit in length and a span wide are not uncommonly used, while the walls of ordinary houses are built of bricks of much smaller dimensions, some of them approaching the ordinary European standard. The difference in the form and size of these bricks is very variable—some are flat, being about 10 inches long, 5 inches wide and 1 inch in thickness; others are 14 inches wide and 3 inches thick, while those in most common use are about 7 inches in length, 3 inches in thickness and 2 inches in width. Besides bricks, curved and plane brick tiles are used in roofing common buildings. In Pekin the palaces and some of the temple buildings are tiled with glazed yellow tiles, having a very brilliant effect in the sunshine. Flat tiles are used in flooring their courtyards and houses; sometimes they are met with as large as 2 feet square and are exceedingly hard and compact in texture. All bricks and tiles made by the Chinese are of a dull grey colour, and hence the sombre grey tint of walls and buildings throughout the country. The fuel employed by the Chinese brickmakers is straw and not coal. Nevertheless Chinese bricks are very durable, hard and compact in structure. Their colour is not owing to any peculiarity of the soil of the alluvial plains throughout China, which is not very well adapted for brickmaking purposes, on account of containing lime; this is proved by the red tint bricks assume when baked in brick ovens constructed after the European model and heated by coal. Chinese bricks are invariably marked with a stamp, and some of the very ancient ones found in the structure of their temples and other buildings bear the date, the place of their manufacture and more frequently the name of the building they are intended for, in this respect reminding us of the marks on the ancient Egyptian bricks. Being of a very fine even texture, bricks and tiles are easily planed so as to join very closely. They are also easily sculptured to form the great variety of ornamental work found over their doors or inner apartment walls.

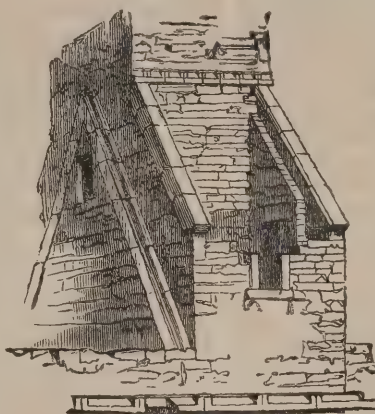
Notre Dame at Mantes.

The vaulting is with oblique groins, as at Beauvais. Generally with oblique groining, the piers are usually alternately larger and smaller. In this church the direct arch between the greater piers seems to be formed on an equilateral triangle, or nearly so, rising on the capitals of the shafts; but on the smaller piers the perpendicular line is continued considerably above the capital, and the direct arch between them is consequently very obtuse. Perhaps it was this whim which attracted the admiration of Soufflot, who is said to have been lost in astonishment at the *hardiesse* of the vaulting, although the nave is only 34 feet wide. The boldness of the architect is, however, sufficiently conspicuous in other respects, for the piers of the chevet are only 1 foot 11 inches in diameter, to

support a vaulting which rises 102 feet 6 inches (English measure) from the ground. One of them is consequently crippled, and has been banded and supported on every side with iron. Gabriel, one of the companions of Soufflot, in his examination of this church, contends that the six columns of the chevet might all be cut away, and that, nevertheless, by the scientific disposition of the stones, the upper part and the vaulting would remain secure. This, indeed, would be something wonderful.

A Mayo Gable.

The accompanying woodcut introduces us to the modes in which ancient builders in Ireland applied stone different to what is attempted at the present day. It represents a portion of an abbey tower in the county of Mayo, constructed with Moyne stone. The gable shown on the



side of the tower is formed by an increase in thickness of the walling of about 6 inches, and on the outline of the gable a semicircular channel is formed with carefully walled stone; on this the ends of the slates rested, and instead of having lead, now usually employed, or plaster, to prevent the water from getting between the wall and the end of the abutting roof, the water was allowed to find its way into the channel or gutter which the slates or other covering overlapped—a mode of construction both ingenious and model.

Decay of Stone.

A cubic foot of toadstone has different weights, according as the stone is more or less decayed, that which is most decayed being the lightest. There is a stratum of bluish grey ragstone in Westmoreland, which lies under the limestone; large cobbles of this sort of stone which are exposed to the air are decayed to a certain depth from the surface, whilst the inward part seems entire; a cubic foot of the outward part of one of these stones weighed 2,378 ozs., when the inward part of the same stone weighed 2,603 ozs. to the cubic foot. This ragstone is very hard, but the same phenomenon may be noticed in a stone still harder. The Cambridgeshire black flint weighs 2,592 ozs. to the cubic foot; the same flint, being in part decayed and become externally white, though black within, weighed 2,414 ozs., and when become wholly white 2,400 ozs. to the cubic foot; the general reason of this seems to be that the pores of the decayed body are augmented. Kirwan has well explained the manner in which nature operates in decomposing stones. "Flints, jaspers, petrosilex, felspar, granites, lavas and ferruginous stones have frequently been said to be decomposed by the air, and the observations of Mr. Greville and Sir W. Hamilton have removed every doubt I entertained on this head. With regard to ferruginous stones in which the calx of iron is not much dephlogisticated this decomposition is easily understood, for this calx gradually becomes more dephlogisticated by the action of water and air, attracts water and fixed air and loses its adherence with the silicious or other stony particles; this is seen to happen to basalts, toadstone, ferruginous limestones, &c. In other stones this decomposition may arise from their containing calcareous earth in a caustic state or manganese, for these will gradually attract water and fixed air and then swell, burst and loosen the whole texture of the stone, as we see happen to bricks that contain lime. Thus also glass is decomposed by long exposure to the air, the alkali attracting water and aerial acid. Mortar, on the contrary, hardens by long exposure to the air, because, though the aerial acid be attracted, yet a great part of the water exhales." The changes produced by the long exposure of bodies to the air, and the causes of them, deserve a more minute investigation than has hitherto been bestowed on the subject.

Public Taste.

The taste of a people, which is to art what public opinion is to legislation, is formed, like public opinion, by habitual social intercourse and collision. The more men are brought together to converse and discuss, the more the principles of a general national taste will become both diffused and refined. Less to their climate, to their scenery, to their own beauty of form, than to their own social habits and preference of the public to the domestic life, did the Athenians and the Grecian republics generally owe that wonderful susceptibility to the beautiful and harmonious which distinguishes them above all nations, ancient or modern. Solitude may exalt the genius of a man, but communion alone can refine the taste of a people.

NOTES AND COMMENTS.

WHEN we find in four months REMBRANDT, WEDGWOOD, BASTIEN-LEPAGE, and the buildings and history of Malta are treated, it will be evident that the "Portfolio Monographs" (SEELEY & CO., Limited) will be as varied as art itself. The latest part, by Mrs. ADY, is devoted to the French painter who in 1876 was contending for the Prix de Rome, and before the end of 1884 was lying in the graveyard of his native village, Damvillers. A life that was so glorious and so brief would excite the sympathy of the sternest critic, and it was one which must appeal to every sensitive woman. Mrs. ADY has written about the artist with a tenderness that befits the subject. BASTIEN-LEPAGE was a type of the earnest artist. The son of peasants who wished to see him happy in some humble Government post in their district, he could not resist the desire to become a painter. Fortunately, he was able to secure a sortership in the Paris Post Office, and his spare hours he offered to painting. To make the most of them he concentrated his powers on his studies, and the habit remained with him. When he made a name he allowed himself little relaxation. As the late ALBERT WOLFF wrote, "His fellow-artists saw him scarcely. To some of them he was a peasant who had yet to be civilised; to others he was simply a bear. He lived by himself, and was supposed to be unsocial; he spoke but little, and was said to be proud. He appeared to despise talk, or at least he was not anxious to refute his critics by speech, and in this spirit he acted to the end." For a time BASTIEN-LEPAGE was compelled to follow the prescribed academic course, but his soul was in revolt against it, and after two failures to gain the Prix de Rome he allowed his inclinations to guide him, and he painted what he saw, instead of endeavouring to imitate ancient artists. Realism was in the air, and he became one of its most faithful exponents. If he were accustomed to Paris ways he might have produced Impressionist vagaries, but his familiarity with country scenes saved him. He produced pictures which were as faithful as MILLET'S, without being gloomy. His *Joan of Arc* suggested how easily he could utilise the peasants to depict the deepest emotions. The fidelity which is seen in his pictures of lowly life qualified him to be one of the greatest of portraitists. All sides of his genius are described by Mrs. ADY, and it is needless to say the illustrations of BASTIEN-LEPAGE'S works are numerous and successful.

AN edition, corrected to 1893, of Mr. ELLIS MARS-LAND'S "Rules and Regulations affecting Building Operations in the Administrative County of London" has been published by Mr. B. T. BATSFORD. It contains not only the by-laws of the County Council under various Acts, but the special regulations which are enforced in the City of London, in the various vestries and district boards. The book is therefore a guide which will be helpful not only to architects and builders, but to all who have any concern about houses in the Metropolis. The size of the book adapts it for carrying in the pocket, and from the arrangement the information that is sought can be found without loss of time.

ONE of the grievances of owners of houses in new districts arises from the demands for making-up roads adjoining their property. The majority of people have a notion that streets and roads are paid for out of some general fund in all cases, and when they receive an order to pay what seems to be a preposterous amount, they become embittered towards authority. It may be allowed it does not seem to be equitable that an individual who happens to own a corner plot should have to pay for two stretches of footway which are devoted to public use. It is harder still when a man who may own nothing that runs on wheels is mulcted for the cost of a carriageway. A case of the latter kind was before the judges in the Queen's Bench Division on Wednesday. The Corporation of Derby having absorbed a suburban district, gave the usual notice about the carriageways as well as the footways being taken over. In due course the sum of 15*l.* 10*s.* was claimed from the frontager, who became the defendant in the action. As he did not pay he was summoned. He admitted his liability for so much of the expense as related to the footway, but maintained he

was not bound to pay for the carriageway. The magistrates agreed with him, and the Corporation therefore appealed. It is remarkable that Mr. Justice CHARLES and Mr. Justice COLLINS, who heard the appeal, considered that notices which included the expense of the carriageway ought not to have been sent, yet they gave judgment for the Corporation, and the case was sent back to the magistrates. The reason for that course was that the defendant had not adopted the proper procedure. When before the magistrates it was for him to show that he was not the frontager, or that he had no premises fronting the street, or any other defence which offered an answer as to the whole. But the defendant was not able to offer such an answer, and had to admit that he was liable as to part. It became, then, a question not of jurisdiction, but of amount, and could only be disputed by a notice under section 257 of the Municipal Corporations Act, the time for which had passed. It is hard on the defendant and his neighbours to have to sustain a contest for which they have to pay the expenses of both sides. Would it not be wiser for the Corporation of Derby to admit that in trying to keep down the rates they were rather hard on the inhabitants of the Letchurch suburb, and come to terms without further litigation?

IT is difficult to understand the action of the Liverpool Corporation in dealing with the proposed Northern Hospital. The DAVID LEWIS trustees, having the disposal of an immense sum of money, arranged to expend a part of it on a hospital "which would be unequalled and unsurpassed by any hospital in the world." But before entering upon the arrangements the trustees wish to have an adequate site. The Corporation are willing to grant a piece of ground in Gibraltar Street, containing 360 square yards, and a strip of land between the site of the present hospital and the Lancashire and Yorkshire Railway, containing 1,545 square yards, besides contributing 15,000*l.* towards the cost of construction. The trustees consider the ground offered is of insufficient area. They say a proper site will cost about 75,000*l.*, and they ask the Corporation to contribute one-third of that amount. An amendment was proposed at the meeting of the Council on Wednesday to the effect that the Corporation grant should be increased to 25,000*l.* When the voting took place there were twenty-six given on each side, and the Deputy Lord Mayor gave his casting vote against the amendment. Eventually it was decided to refer the subject once more to the finance committee, when it is to be hoped wiser counsels will prevail.

THE Council of the Bristol and Gloucestershire Archaeological Society have proposed that a photographic survey of the county be commenced under the auspices of the Society, that an executive committee be appointed to draw up a scheme for carrying out such a survey, and that such committee consist of three delegates from each photographic society in the county, and as many members of that Society as should be equal in number to all the other representatives. When the survey was suggested to the Council it was contemplated that it should be confined to archæology, and such a survey only would be inaugurated by the Society. If, however, it was generally wished that the survey should be extended to other studies, such as natural history, geology, botany, &c., representatives of the various societies and clubs connected with such studies would naturally be invited to join the executive committee, with a view to drawing up rules for the scheme thus enlarged. At the meeting of the Society which was held last week, Mr. H. S. PEARSON was able to give information concerning the progress of the photographic survey of Warwickshire. In 1829 the subject was first brought before the Birmingham Photographic Association. In 1890 a survey council was appointed, and since that time no fewer than 2,100 permanent photographs of archæological interest in the county have been taken. Two public exhibitions of these pictures have been held, and 1,600 of the prints have been presented to the public library for reference. The remaining portion of the photographs will also find their way to the same building. Copies of portraits were lately included in the work of the survey. From the success attained in Warwickshire it might be supposed that similar organisations would be established throughout the country, but the counties are only slowly adopting the idea.



INA PHOTO SPRAGUE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.

D. LADY,
(POEM.)
FAIRFAX-MUCKL



THE WEIRD LADY.

From the "Weird Lady" by J. M. W. Turner.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

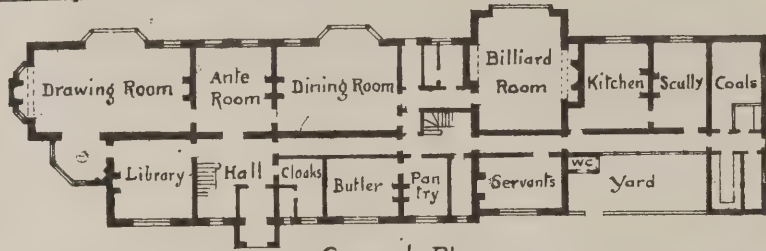
May 4th 1894.



INX PHOTO SPRACUE & CO 4 & 5 HARDING STREET FETTER LANE E.C.

BIRMINGHAM.
HEATLE, Architects.

West-Coomb · Sussex ·



Ground Plan

HCFraser-Arch^t



May 4th 1894.



Horace C. Trade
March 1894

ILLUSTRATIONS.

THE WEIRD LADY.

THE illustration is reproduced from a large drawing by Mr. LOUIS FAIRFAX-MUCKLEY, which was exhibited in the Royal Academy in 1890. The scene is taken from one of the late CHARLES KINGSLEY's poems. It relates to HAROLD the Earl, who for a time was enthralled by the Weird Lady in a charmed castle over the sea. At last he was able to return to his own country:—

Earl Harold came to his castle wall;
The gate was burnt with fire;
Roof and rafter were fallen down,
The folks were strangers all in the town,
And strangers all in the shire.

Then he went to a nunnery where the burial service was being chanted for one of the sisters—his own lady—who died for the love of a traitor knight:—

He stayed the corpse beside the grave;
"A sign! a sign!" quod he,
"Mary Mother, who rulest heaven,
Send me a sign if I be forgiven
By the woman who so loved me."
A white dove out of the coffin flew;
Earl Harold's mouth it kist;
He fell on his face, wherever he stood,
And the white dove carried his soul to God
Or ever the bearers wist.

The artist has represented the scene in the last verse with adequate dramatic power, and it will be admitted that the task was not easy.

WEST-COOMB, SUSSEX.

WAREHOUSE, BIRMINGHAM.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. The house list for the ensuing session, as nominated by the Committee, was read out, Mr. E. W. Mountford being nominated as president, and Mr. Booth and Mr. Earle as vice-presidents.

In the absence of Mr. R. A. Briggs, who was unable to attend, Mr. GOLDSMITH, hon. secretary, read the following paper on

Modern House Planning.

When I began to consider what I should tell you about house planning, its difficulties and what to plan and what to avoid, I found that it would be impossible to confine myself entirely to the plans, as the elevations, sections, details and, indeed, the whole building should grow in your head as you plan. Nothing should be left to chance, and as you plan your building you must have in your mind's eye not the lines you put on the paper, but the building itself as it will look when finished, with the lights and shadows, doors and windows, full lights and cross lights, and indeed the whole building finished and furnished and ready for occupation.

I have always found that the easiest method to start on planning a building is to draw it out—plans, elevation, sections and perspective to a very tiny scale, such as 32 feet to the inch, and I generally make these sketches in an ordinary architect's pocket-book, with the paper lined in squares. One can erase and alter very easily and quickly with such a small scale. Then when I have the whole thing thought out I begin to work out the building to eighth scale, when I, of course, put in all the details of the plan, &c.

After the very interesting and deeply instructive paper which our learned professor—Professor Kerr—has read in another place on "Town House Planning," and to which I have but little to add, I will confine my remarks to country and suburban house planning, particularly as I have had more experience in that class of house.

Well, now, let us start at the beginning. A gentleman comes to one of us (I wish these gentlemen came more frequently) and wants us to design him a house. He has bought a plot of land which he considers admirable—beautiful views, near a station, gravel soil, water and gas laid on, and the land having a gradual slope to the south. Nothing could be better; an ideal site in every way. Well, what sort of a house does he want? what accommodation? what does he like? and last, though not least, how much will he spend? He answers these questions, and he probably impresses us with some point he considers most important—some crank, such an one as I remember a client once had when he came to me, and, in telling me what his requirements were, impressed upon me most seriously that he did not want any licentious curves about his

house. Well, I did not want to give him any such wicked things; but I saw he had been reading Ruskin, which is a very good thing for all of us to do.

I never like a client to go too closely into the plan of the accommodation, as it is liable to hamper one and influence one too much in looking impartially at the proper planning required. As long as a client gives me roughly the sizes of the rooms and their number, and generalises about their position, I am happy. One must, of course, "draw out" our client as to the style of the house he wants. Does he like the old manor-house style, with mullions half timber-work, or does he want sash-windows? His answer will be the "cue" to the whole building. If he likes mullion windows, tiled roofs, half timber-work and lead lights, I know what he wants; but if, on the other hand, he says, "Oh, sash windows, of course, and good square rooms; none of your tit-bits and pokey windows and corners," then I know my gentleman, and eighteenth century shall be his portion.

We have now a basis to go on, and we will take the house of the manor-house style first, although the general arrangements of the plan would not be affected even if we took the house with the square rooms first, as I shall presently show.

We will say our client wants a drawing-room, dining-room, library, hall and kitchen offices on the ground floor, and about five or six bedrooms, bath-room, &c., on the first floor. We go down and see the land our friend has bought, and note on the plan of the ground the direction of the views, the falls in the ground, and the proposed position of the gardens, tennis-court, carriage-way, &c. And here I would interpolate that the public must be taught that the general arrangement of the gardens is distinctly an architect's duty. Why people should think that an architect's work stops short at the house I can never imagine. The public expect us to design the mantelpieces, panelings, &c., in a house, and then, for no earthly reason that I can see, they wish us to hand over the finishings and furnishings of the house to some firm of decorators, and the garden, which is the setting and frame to the house, to the landscape gardener, so that he may work his sweet will in designing curlywig paths and flower-beds in the shape of pears, sausages, or any other atrocity that commends itself to his "fuzzy-wuzzy" brain. However, I hope that by degrees the public will understand that it is as much the duty of an architect to arrange the gardens and furnishings as it is for a painter to choose the frame for his picture. But to return to our plan, and to what nearly everyone will take our advice about, and that is the position of the house.

Where it is possible, and I have generally found it so, it is best that the entrance front, with carriage drive, should be towards the north, so as to allow the garden front to be towards the south, in which front you will have your windows to the drawing-room, and to as many of the other reception-rooms as you can. I would here, however, mention that it is never advisable to place your house directly north and south. It should be "tipped up," as it were, on plan, either towards the north-east angle or towards the north-west angle, so as to allow the sun to glint, at one part of the day, on the north side. The side of a house which never sees the sun is sure to be cold, and to cause the rooms to be cold also and cheerless. My experience is that, in the East of England, you should "tip up" your house on the north-west angle, and in the West of England on the north-east angle, and then, when possible, arrange a belt of trees in the direction of the "tip" to shelter the house from the gales, which in the East of England would come from the east in most cases, and in the West of England from the west, as these heavy gales generally come from the sea. I have often noticed this small thing, which will show that we architects must have our eyes everywhere. In the East of England the trees slope to the west, whilst in the West of England they slope to the east, showing plainly from what quarter the heavy gales come. Therefore, when you are going to build a house in a new (to you) locality, see which way the trees slope and "look out for squalls," because on that side you must arrange there shall be the fewest number of windows, and mind you see that your walls are prepared for the squalls. Well, now as to the disposition of the rooms.

We start with our entrance porch and vestibule, and do not cramp them. There should always be a covered porch to a country house, so that callers may be under cover whilst the servant is answering the bell, and it protects also the entrance door. There should also be a vestibule with folding doors to prevent the draught from the front door coming into the hall. In porches I have often noticed architects put seats, but I always think this is a work of supererogation, as I have never heard of callers at the present day being so tired that they could not wait till they were ushered into the house, and there are usually better positions to be found for seats for the inmates of the house. The details of the porch, vestibule and hall should not be meagre. They are, as it were, the frontispiece to the house, and a good impression on entering should always be contrived. A speculative builder, whose name I dare say many of you would know if I mentioned it, who had

made his pile on rather small-class houses, was once asked how he had been so successful, and his reply was:—"Well, yer see, I always put a Corinthian cornice in the front portercio." We do not want to copy our friend exactly, but, without being snobbish, we can make our entrance look inviting. "Welcome the coming and speed the parting guest."

I always try and arrange that the hall can be used, if desired, as a room, and it is also very economical planning. And if you put it in the middle of the plan you can have nearly all your rooms opening into it and so save passages. Brillassavarin said, "A dinner without cheese is like a pretty woman with only one eye." Well, I think a house without a good hall is like a woman with no eyes at all. And remember that passages, except for the purpose of giving access to rooms, are all waste space. The problem therefore is to do away with as much passage space as possible. "A passage saved is a room gained," we may say. In the hall at one end you can put a bow window, and near it the fireplace, with a cosy seat, well out of the draught, and at the other end of the hall there would be the entrance and vestibule above referred to. The front door should not be far from the pantry and kitchen, so that the servant will not have far to come in answering the bell. Either in the hall, or just off of it, the principal staircase should be placed, and if possible it should be in such a position that people either going up or coming down the stairs are not in full view of the entrance door. Very effective features can be made of a staircase like this, as may be seen from the designs of many architects I could name. As a rule never cramp the size of your staircase window.

Now let us take the pantry. The pantry must be near the kitchen, and also near the dining-room. And as we do not want to know directly we come into the house in the evening what we are going to have for dinner, nor to let anyone who may happen to come into the house know that the dinner we are going to have will be stewed steak and onions, the kitchen must be shut off by a lobby. What easier thing than to make this lobby into a serving-lobby, with a sliding hatch and double doors? This therefore means that the dining-room must be next this lobby, and thus we get the position of the dining-room. Again, as most people think of themselves first, and as we have not got so far in England as to put our servants in better positions than ourselves, what more natural than that we should put the dining-room towards the south, and the pantry and, if necessary, the kitchen towards the north?

Now then about the kitchen offices, and I fancy some one says, "But you have said nothing about the drawing-room and library." "Quite true, my friend, I haven't." But if you are designing a house for a gentleman, and that gentleman has a wife who is a housewife, woe betide the architect who has not arranged the kitchen offices properly. I remember once designing a house for a lady, and taking the sketches to her, and before she had even seen the plans she said, "Where have you put the housemaid's closet?" Luckily, I had not forgotten it, and had put it in a proper position, but believe me these little (apparently little) matters are the soul of a good plan. In the kitchen, consider seriously this point, the position of the range, so that it (1) shall have a good light on it, that the cook can see into her pots and pans, and (2) that it shall be so placed that the smells can be taken up into a ventilator and not wafted through the serving-lobby into the house. A serving-lobby will prevent a part of the smells coming into the house, but care should be taken to prevent them getting even into the serving-lobby. My experience is that the best place for the range is opposite the door leading to the serving-lobby. The scullery will, of course, be immediately next the kitchen, with direct communication. Then north of the scullery you will place your larder. The position of the larder is important. It must face the north. As Napoleon's answer, during his Russian campaign, to his officers when they were continually questioning him, was always the same, "North," so you in your planning campaigns must remember "larders north." Some architects put their larders with communication from the kitchen, but I think the communication is much better from the scullery. Kitchens get hot, and hot air coming through into the larder is not a good thing for the food placed there. Larders should have lots of ventilation, and I fancy the mistake nowadays is that the architects make the windows too small. I think a larder window should never be smaller than 3 feet by 1 foot 6 inches, and it should have a sheet of perforated zinc instead of glass. Directly out of the scullery, or immediately next it, the coal-cellar and servants' water-closet should be placed. I think the best arrangement for access to these is to have a covered way. You can, of course, let them open into the scullery, but I think it is better they should have their entrances into the kitchen yard or court. It is a much cleaner and sweeter arrangement. To your scullery you will probably have your tradesmen's entrance; arrange this so that the tradesmen need not pass the servants' water-closet. As to wine-cellars, I fear they do not receive the attention they deserve. People do not, I fancy, "lay down"

wine like their grandfathers used to, or else they arrange that their wine merchants keep it for them. Anyhow, my experience has been that only quite small wine-cellars are required, and in most cases they have been kept for economical reasons (generally to save the expense of excavation) on the ground-floor. This is not a bad arrangement if you put hollow walls all round them, and the iron bins you can buy now allow for a large quantity of wine to be stowed in a very small compass.

We will now go back to the hall, and in passing through it we must consider the ground-floor water-closet and lavatory. In every fair-sized house there should be these apartments arranged on the ground floor, and they are difficult apartments to arrange, as they should be out of the way, and at the same time easy of access and easy to find without showing too apparently what they are. Where I often place them is under the landing and stairs, and if the walls are of brick and the ceiling pugged and plastered, I do not think that any inconvenience is likely to arise from this arrangement. Where the mistake has so often been made is to put only 1½-inch or 2-inch partitions to them, but if you put 4½-inch brick walls in cement to them, I do not think it possible that anyone will herald his presence there to the whole household when using the flushing cistern, which, as we know, certainly rings out its clarion note in a somewhat clear and aggressive manner.

Let us, however, pass on to the reception-rooms. We have already decided the position of the dining-room—at one end of the hall, not far from the entrance vestibule, which position was tied by the position of the pantry. A dining-room should be a parallelogram on plan, and it should not be too much cut up with bays and oriels, &c. These are for the drawing-room. The great points to consider in a dining-room are:—(1) That it shall be wide enough for the servants to get easily round the table when the people are seated; (2) that the sideboard shall be close to the serving-lobby and door; (3) that the fireplace shall be far enough away from the table that the persons seated at table shall not be roasted during meals (an angle-nook fireplace will obviate this in a narrow room); and (4) that if the window is at the end of the room and behind the end of the table, it shall not have a light in the middle, so that the host or hostess, or whoever is sitting at the end of the table, will be eating in comparative darkness, and, like the lady in Gilbert's opera, "might very well be taken for forty-two in the dusk with the light behind her." If you must have a window at the end of the dining-room, put a mullion in the middle of it, if a mullioned window, or put two windows with a pier in the middle, and then contrive a window in the side wall, we will say towards the east, to get the morning sun. I think the best arrangement, however, for lighting a dining-room is to put the windows on the long side of the wall and an extra subsidiary window in the end wall. Then your hostess will eat in comfort and bless you, her architect, that you have with true gallantry considered not only her comfort, but the proper setting to her charms.

Well, now we come to the drawing-room. This, with the library, will probably be on the opposite side of the hall to the dining-room, and this is not a bad arrangement. A dining-room, after a meal has been served in it, ought to be aired, and it is not agreeable for people going in or coming out of the drawing-room to be running up against the servants either laying or clearing away the lunch or dinner "things." Besides, we still keep up the old fashion of going in to dinner in procession. Alas! not many old fashions are kept up nowadays, so let us preserve those we can; and the procession across the hall is a pretty sight, and reminds one of what the polonaise or the minuet used to be.

The position of the drawing-room and library will probably be south and west. Perhaps, too, the library will have a window towards the north. It would, however, be better to keep the window towards the west. The drawing-room can well face the west as well as south, so as to get the sun before setting; and as a rule the drawing-room is not much used before the afternoon. In the drawing-room you can show off all your little tit-bits, bows, oriels, bays, seats, &c. A drawing-room need not be, and is generally better for not being, a plain parallelogram. An L-shaped room is always cosier for a sitting-room, and besides, a room of this shape can be much more prettily furnished. If you cannot arrange the L-shape, throw out a large bow window at one end or on one side, near the end of the room. A drawing-room may have many windows, only remember that there should be always a part of the room near the fireplace which will be well out of any draught from any window or door. The library will be probably next the drawing-room, and bear in mind that it will be necessary to arrange your windows and doors so that book-cases may be fitted up round the room. If your client's wife is a woman who has much "society," and gives dances, &c., you should arrange your library so that, by having sliding doors in the wall between the library and drawing-room, she can throw the two rooms into one, and make one big room for dances. In planning the drawing-room and library you should remember that the arrangement should be "telescopic"—either that the

drawing-room can be compressed into a snug boudoir or opened out into a large ball-room.

Now let us go up the stairs, and in designing the stairs make the treads wide and the risers low. The old, easy staircases we find in old houses used to be 6 feet and 7 feet wide, whilst their risers were never higher than $4\frac{1}{2}$ inches or 5 inches. What a difference to the narrow ladder staircases we find nowadays.

On the first floor, in economical planning, the first thing to consider is the position of bath-room and water-closet. We must try and arrange the water-closet so that the soil-pipe shall enter the drain where the principal ground-floor water-closet does, so that the soil-pipe (and soil-pipes are expensive things) shall act as the ventilator. Therefore the water-closet must be, if not over, nearly over, the water-closet to ground-floor, and the best position for the bath-room is generally over the pantry. In any case it should be over some such office, so that in case of any overflow the water does not ruin some expensive tapestry or paper in a reception-room. If you put the bath-room over the pantry, you can take your waste-pipe to empty over the trap which takes the pantry sink. The bedrooms will be disposed over the rooms you have arranged on the ground-floor. When planning bedrooms, these things should be borne in mind. First, that you do not want so much light (otherwise windows) in a bedroom as you do in a sitting-room. One window to each bedroom will generally be sufficient. Secondly, always draw, when you plan the bedrooms, the position of the bed, placing it well out of any draught from window or fireplace and door. And, thirdly, always let your doors open so that when open they hide the room. I generally try to arrange that for a sitting-room the door will be in the wall at right angles to the fireplace and at the furthest corner from the fireplace, whilst in a bedroom the door will be in the wall at right angles to the fireplace but at the nearest corner.

The cistern-room should be over the bath-room, and it should be easily got at.

As to cupboards. Some housewives are crazed about them, and would like to have them sprinkled about the house as they sprinkle their bows and ribbons. But beyond a house-maid's closet near the water-closet, and a linen closet near the bath-room, so that the hot-water pipes or cistern can keep the linen aired, I do not see the necessity of putting many cupboards about. There are, of course, the cupboards in kitchen, scullery and store-room, but I think cupboards in bedrooms are unsightly things, and that wardrobes are much more useful. This is a matter, however, in which you will be guided by your client.

Well now, gentlemen, we have discussed the general arrangements of a house and the disposition of the different rooms. The individual tastes and idiosyncrasies of the client, and the exigencies of the site, will cause us sometimes, however, to alter in detail the positions of the rooms, but I think if we bear in mind the following points, where they will be possible, we shall not go far wrong in our plans:—

1. Have a good porch and hall, with the staircase not in full view of the entrance.
2. Have your pantry as near as possible to the entrance.
3. Have your dining-room and kitchen near your pantry and near each other.
4. If possible let all, or nearly all, your reception-rooms face the south; the kitchen and stairs and offices can then face the north.
5. Let your drawing-room be "telescopic" if possible.
6. Have your bath-room over your pantry.
7. Have as few passages as possible.

As to this last, which I would say is one of the most important, I would also add this. Never skimp the width of your passages. Three inches is worth three times as much in a passage as in a room. The three inches would not be felt in a room, whereas it would be very much felt in a passage; and I think the great problem in all house planning is to reduce as much as possible the necessity of passages, but where you have one, make it a wide one. No passage ought to be less than 3 feet 9 inches. Although we can copy (though not slavishly) the forms of the houses of the sixteenth, seventeenth and eighteenth century, their quaint gables, bay windows, oriels, turrets, porches, &c., we must adapt them to our modern ideas of plans. We can assimilate their good points and expurgate their bad.

Now let us consider the differences between designing a house for a client who likes these fine old houses, mullioned windows, oriels, &c., and designing a house for a client who wants sash windows and plain square rooms. In the one case you are not fettered; you can throw out a gable here, a gable there, and the more haphazard the design the more happy it seems to be. I have often felt that the backs and sides of some houses designed nowadays are more interesting than the fronts, and I think it is because the irregularity has not been studied. Studied irregularity is never pleasing. It is a fraud, and frauds are always seen through even if they cannot be explained.

Studied regularity, on the other hand, if there is nothing incongruous in it, is pleasing. We admire the tact, the skill and the thought that has been expended on it. But, for goodness' sake, do not let us go back to the times when, to conform to regularity, we have a staircase and landing with balusters showing through the middle of a window, so that the window-cill may be on the same level as the adjoining cills. If the cills must be on a level it is bad planning, and if they need not be on a level it is bad designing. As to the differences in plan between what I call the manor-house style and the eighteenth-century style, in a nutshell I would say, where in the one style you have irregularity in the disposition of the rooms, in the other you have regularity. In the one style you may put your bays out of the centre of the rooms and where they happen to come. In the other style you must think out before you decide on the general disposition of the rooms where you will have your bays and porticoes.

Mr. Briggs concluded by explaining several plans of houses he had built in various parts of Middlesex and other counties.

Mr. FRANCIS HOOPER proposed a vote of thanks to Mr. Briggs for his paper, coupling the name of Mr. Goldsmith for reading it. He thought it was advisable for an architect to show his client a garden plan. Local materials, he thought, ought, as far as possible, to be adopted, and the design to be harmonised with local architecture. The remarks as to the aspect of buildings he concurred with, though the remarks as to prevailing winds on the coasts were new to him. He thought great care should be used as to the position the fireplace should occupy in a room, as also the position of windows. The fireplace should be clear of the door and of draughts. Doors were also liable to be put in the wrong place.

Mr. BERNARD DICKSEE seconded the vote of thanks. He differed from Mr. Briggs as to the arrangement of the dining-room window.

Mr. BRODIE advocated the provision of ample cupboard-room, even one in which a portmanteau could be unpacked.

Mr. FLETCHER thought that few persons liked angle fireplaces except on paper.

Mr. BEALL and Mr. GOLDSMITH also made some remarks.

The PRESIDENT said Mr. Briggs, in his paper, seemed to have covered the whole ground of planning a house. He did not think, from an artistic point of view, that rooms should be too lofty. One feature he had noticed in some of Mr. Ernest George's houses was the arrangement of a chamber over a corner fireplace in a room 16 feet high, approached by an internal staircase, whence the lady of the house could see all who entered the room. Windows of bedrooms should face the rising sun. A room should never face due west. Architects should plan the furniture with the buildings, especially in regard of bedrooms. The vote of thanks as proposed, and further coupled with the names of Mr. Belcher, Mr. R. Blomfield, Mr. Ernest George and Mr. Newton, who had lent drawings, was passed by acclamation, and the meeting terminated.

CŒUR DE LION'S CHARTER TO NORWICH.*

ON May 5, 1894, we shall reach an interesting anniversary in the history of our city. On that day the citizens will have enjoyed 700 years of self-government, for on May 5, 1194, King Richard I., by the charter here displayed before us, granted the city to the citizens and their heirs, with the right of choosing their own governor from among themselves, subject to the king's approval. The actual "granting of the city to the citizens" is perhaps hardly brought out in the charter so definitely as might be expected, which no doubt accounts for the fact that this charter has sometimes not received the attention which it deserves, being, for instance, ignored by the compilers of this roll of the governors of the city. There can, however, be no doubt that the citizens were then for the first time made lords of the city. They paid the king 200 marks (133*l.* 6*s.* 8*d.*) for the privilege, which is thus recorded in the Royal Exchequer Roll of the following year:—"The citizens of Norwich have granted to the king 200 marks for having confirmation of the liberties of their city, and for holding the city in their own hand, so that they may answer for the due farm (or fixed rent) at the exchequer."

I have called King Richard's grant the first grant of self-government to the citizens for want of a better way of expressing what was given. But it is necessary to observe that, although this is a truth, it is very far from being the whole truth. The subject of the political condition of boroughs in early times and the exact character of the privileges they enjoyed, is a very obscure one, and I can claim no absolute certainty for the attempt I am about to make to explain the political condition of Norwich at the time of King Richard's charter and the benefit the citizens derived from it.

* A paper read at the annual meeting of the Norfolk and Norwich Archæological Society, by the Rev. W. Hudson.

It would take far too long to discuss all or many of the numerous matters touched upon in the charter. We may pass over those which concern the rights of the citizens as traders in other places. Our business is with the citizens at home, and (what we shall see was even more important) their relation to the king, who was their lord. I am anxious to keep this point clearly in view, that (apart from their commercial dealings with outsiders) the two great objects the citizens had to provide for were (1) to satisfy the demands of the king as their rightful lord, and (2) to manage their own internal affairs to the best advantage, so far as they were allowed to do so.

The same thing is true now, though under widely different conditions. The rulers of the city have to satisfy the requirements of the Imperial Government, as well as provide for the efficient administration of the city. The latter province of duty is tenfold more complex than it was in King Richard's day. As regards the former, the great difference is that in the days we are speaking of the Imperial power was centred in the person of the king, whereas now it is hard to say where it is. I could almost imagine that our mayors or town clerks would sometimes prefer to deal with a king who, though a trifle capricious, was yet always ready to give very substantial privileges in return for a handsome present, and who asked for money and very little else, instead of the miscellaneous host of heads of Government departments, who seem to spend their time in devising how many distracting orders they can send down to worry the brains and disturb the peace of local administrators.

Keeping this twofold aspect of municipal life and action in view, I will found my observations on three points of the charter. First, the grant of the city to the citizens; secondly, the title and office of the governor they were authorised to elect; and thirdly, the "husting" court, which they were allowed to hold once a week. If we can arrive at an understanding of these three points, we shall have a fairly clear conception of the municipal life of Norwich in 1194.

First, then, who were the citizens to whom the king granted the city? Our best help towards answering this question is to be obtained from the account given in the Domesday Survey of King William the Conqueror. In that survey Norwich is called a "villa" or town, and in it were 1,320 "burgesses." This was in the lifetime of King Edward the Confessor, say A.D. 1060. These 1,320 burgesses were not all circumstanced alike. They were under three separate jurisdictions or lordships. Fifty were under the lordship of the Bishop of Thetford, 32 under that of the Earl of East Anglia, and the rest, 1,238, under that of the king and the earl. The two former we have nothing to do with. The 1,238 were organised in what was called a "burgus," or borough. Of them the king and the earl had the "soc, sac and custom." The meaning of the two first words has been much disputed. In general terms they amount to this: that the burgesses had to seek their justice from a deputy of the king, and that all the money paid as fines for wrong-doing or as tolls or other like payments went to the king and the earl, the king taking two-thirds and the earl one-third. Then we are told, "This whole town rendered 20% to the king and 10% to the earl," besides some smaller dues. Now we have, I think, in these few details a very important clue to the political condition of the burgesses at this early date. Why does the survey so carefully specify the number of the burgesses, and to whose jurisdiction they belonged? Was it to ascertain the amount of the population? Certainly not. It was because each one of them held a tenement which was chargeable with a certain definite payment (in the nature of a rent) to the king if they were in the "burgus," to the earl or the bishop if under them as lords. The king's agent directly demanded this payment from the holders of these tenements. In this respect they were so many separate individual tenants of the king. On the other hand, when we are told that "whole town" paid a lump sum to the king and another to the earl, it is plain that this implies that they had the power of acting in a body. The king's agent did not collect that payment from them separately; they collected it amongst themselves and paid it to the agent through some accredited head of their own. Who that head was and what else they were allowed to do amongst themselves will come under the other two branches of our subject. At present I would point out that at the time of the Norman Conquest the burgesses were in some respects individually responsible to the king, in others they enjoyed a communal organisation as one body working and acting together.

The Conquest did not materially affect this condition. The Frenchmen who settled in Norwich were formed into a "new burgh," that is, they had their own separate and corporate relations to the king, as the older burgesses had. Soon after this, through the rebellion of Earl Ralph and the disgrace of Bishop Stigand, their jurisdiction fell into the king's hands. It appears also that in the course of two or three generations the distinction between the old and the new boroughs died out. There is mention of the two organisations in Stephen's reign, but (except possibly one doubtful

reminiscence) there is no trace of it afterwards. The "citizens," then, at the time of King Richard's charter, were, with a modification noted below, the burgesses mentioned in Domesday, with their individual obligations and communal organisations which we have there traced out.

We pass on to our second point, the right to elect a provost of their own—an important step towards becoming lords of their own city. What was a "provost"? I cannot help thinking that the word is an unfortunate one, and has led to a good deal of misconception. It was not the word used at the time, unless, perhaps, by the Frenchmen of the new burgh. The great mass of the citizens, speaking in their own English tongue, would call him their "reeve," or the "borough reeve." It was the Latin clerks who translated "reeve" into "prepositus," ruler, and the Norman-French turned "prepositus" into "provost." This is the history of the word. When we come to consider what kind of an office it described we are brought face to face with the much-disputed question of the origin of English boroughs. Some have thought that they were relics of the Roman occupation, a sort of political islands which survived the deluge of the Saxon invasion, and preserved, as in so many arks of refuge, the institutions of a bygone age. This theory has, I think, been quite discredited by scholars of the present day, even London (an undoubtedly Roman city) showing no trace of Roman institutions. Another theory, started by the courtly lawyers of the Tudors or the Stuarts, supposes that they were devices happily thought of by the early kings for the defence and well-being of their kingdoms. This is supported by no foundation of evidence. The latest theory is certainly the most reasonable. They were not relics of a former rule, nor an artificial invention of kings, but were the natural outcome of the increasing civilisation of Saxons and Angles, and more especially Danes. The influencing causes were not always the same. Most commonly, however, a town sprang up where some one or more commodities, such as fish or salt or iron, or foreign goods sought after by a settled population, could be procured and transmitted to those who needed them. If a powerful lord were there to protect the settlers so much the more was the town likely to develop. These two favouring causes are sufficient to account for the origin of Norwich.

Now, this being so, the townspeople being of the same race, habits and character as the country people, may we not reasonably expect to find them with similar institutions, only adapting those institutions to their differing circumstances? Our forefathers were much more clever than we are at making the same general principles give life to varying organisms. They did not, as we do, require every local organisation to measure itself by the same rule. What, then, was the condition of the country as these little commercial settlements (mere villages at first) grew up into important boroughs? It was divided up into a multitude of estates, which, long before the Norman Conquest, had assumed the form, if not the name, of a feudal manor—that is, each had a lord, who was as a little king in his own domain. Under him the greater portion of the land was held by tenants on condition of rendering certain services. Exactly a similar state of things is found in such a town as Norwich. The lord was the king and the tenants were the burgesses. The only difference was in the nature of the services. On the country estates the services were ploughing the lord's land, sowing his crops, reaping his harvest. In the town, where these services were not needed, the obligation was fulfilled by a money payment. Every burgess held what was called a "burgage" (that is, a piece of land with a house on it), for which he paid a rent called "landgable," or land rent. The 1,238 burgesses of Domesday were the persons who held these "burgage" tenements, and, as individuals, paid the "landgable" rent. When Richard gave the city to the citizens, and they became its lords, these rents passed into their hands. The list of the tenements was carefully preserved, and several such lists have survived from the time of Richard II. to that of James I. I am not sure that we should be right in concluding that the burgage tenants correspond exactly with the "citizens" to whom Richard granted the city. I think not. I think that even then, to become a "citizen," it must have been necessary to apply to the existing body of citizens for admission into their fellowship, and to fulfil the conditions of satisfying their inquiries as to character and credit, and also to pay an admission fee. Every organised society, such as even the burgesses of Domesday were, must exact some such guarantee from its members.

This concerned the separate obligation of each burgage holder to his superior lord, the king. But, as we have seen, they had already for many generations been banded together in some sort of corporate unity. For this purpose they must have had some head. Who was he? We may find an answer in the ordinary manorial organisation. In every ordinary manor the tenants elected one of their own number every year as a sort of foreman, who was called the "reeve," or, in Latin, "prepositus." The office was not looked upon as an honour. It was a burden which might not be refused. The duties con-

sisted chiefly in overlooking the tenants and labourers in their work, and (in general) being their responsible representative to the lord. He and four others also represented the township in the king's courts of justice. In a small manor the lord would deal with him directly, but in a large manor there was also another official, a bailiff. He differed from the reeve in this way. The reeve represented the tenants to the lord. The bailiff was the lord's agent, appointed by him, and representing his interests alone. In the time of Domesday, no doubt, the government of the "burgus" of Norwich was organised in this way. The burgesses in their corporate capacity would elect a "borough-reeve," who would be responsible for the lump sum which had to be collected, and would be their head in their internal self-management. The "lord's bailiff," through whom he dealt with the burgesses and their reeve, would at that time be the earl, at a later time either the constable of the castle, or, more generally, the sheriff of the county. But it will be observed that before King Richard's charter the borough-reeve was appointed by the king, not elected by the burgesses. Blomefield states that King Henry I. appointed the first provost in 1122, but there is no authority for this assertion. There is no reason why all the towns on the king's ancient demesne (as Norwich was) should not have had a reeve (as London had) from their first organisation as a "burgus." It is easy to see why the appointment fell into the hands of the king. Even in some country manors a powerful lord would claim the right to appoint the manorial reeve himself. The reeveship of a flourishing borough was too important an office to be left in the hands of the burgesses until the political necessities of the kings led them to seek their favour and pecuniary support by granting them this privilege.

The "provost," then, was the old "borough-reeve," who, although for obvious reasons of policy he had long been appointed by the king, was yet in his real character the chief citizen, the head and centre of their corporate unity. It was a great step which King Richard now enabled them to take. It amounted not only to placing in the hands of the citizens the choice of their own head, but to making that head for the future his bailiff or agent. Hitherto the reeve had been only half their own, and, moreover, between their representative and the king was the sheriff. Now their head was to be altogether of their own choice, and in the most crucial part of their obligations (the money payments) he was to deal directly with the king's chancellor at the exchequer in Westminster.

Our third point will bring us to what the citizens, no doubt, thought the most valuable part of the king's gift—the control of their own court of administration. "We have granted," says the charter, "that the husting may be held once only in the week." The "husting" was a local court. The word is of great interest, and, like "provost," has led to much misconception. The best known husting court is that of London, and Lord Coke and other great lawyers, who thought London had been the front and origin of all municipal life in England, maintained that Norwich and other places which had such a court derived their court from London. All the local evidence is against this theory. The court was not now established for the first time either in Norwich or elsewhere. This very same clause appears in a charter granted to London itself on April 23 of this same year. Yet the London court had been founded by King Canute nearly two hundred years before. It appears also in other contemporary charters, and especially in one to the citizens of Lincoln, with the significant difference, that instead of saying that the "husting" may be held once a week, it says that the "burward mote" may be so held. That is the "mote" or meeting of the burgesses. The "husting" then, was the old court of the burgesses, the "borough-mote," as it is sometimes called. We may pause for a moment over the significance of the word "husting." It is a Danish word, meaning "home-court." It is generally explained as describing a court or assembly held in a house instead of in the open air. Primitive assemblies were always held in the open air, and were so held in Norwich—most probably on Tomblond. Before the time of King Richard, however, another court or place of meeting had been established in the tolbooth in the Market. They may have both continued together for some time, as they did in London. Here, apparently, the opening court had at this time died out. All the business of the citizens was conducted in the tolbooth.

It has occurred to me, and very likely to other students (I know of one) that the reason why this court in a borough was called a "husting" was this: The name first occurs in London in the reign of Canute, the Danish king of England. Now, Canute had a body of soldiers called "hus-carls," that is, fighting men attached to his house or royal residence. May not the "husting" in London have been a special court attached to the "king's house" (not merely a court held in any house)? We may suppose that while for certain purposes the burgesses of London continued to assemble in the open air, Canute established in his "house" a court for dealing with such judicial matters as land disputes or inheritance. A similar

practice would, of course, be followed in Winchester, which was also a royal residence, and there the word "husting" was early in use. The practice would naturally be followed also in all the towns on the king's demesne, only, strictly speaking, the name "husting" would not be so appropriate. As a matter of fact, it never was used in Norwich by the people themselves. It was used by London clerks to describe a similar court to that which they knew by that name in London. The Norwich people called it their city (or borough) court. According to this theory, a "borough court" corresponded to the manorial court, the earliest name of which was "halimote" or hall-mote; that is, the "meeting held in the lord's hall," the court afterwards known as the "court baron."

In Norwich (though not a place of royal residence) there was, in Canute's time, one of the four great earls among whom he divided the kingdom—the Earl of East Anglia. To him we may well ascribe the establishment of such a court as the king's "husting," only, instead of summoning it in his hall, he held it in the "tolbooth," the official place where the king's toll was received. Here, also, in course of time the open-air meetings of the burgesses came to be held. It appears, then, that in King Richard's time the borough court included two separate functions. On one side of it was the old assembly of the burgesses, where they transacted the business of administering the city, admitting new members, regulating trade and perhaps dealing with debts and breaches of contract and other commercial matters. On the other side it was the king's court (not as king, but as lord of the city), in which were decided matters relating to land and inheritance. But although it was the court of the city, it could hardly be called the court of the citizens, for the president was appointed by the king, and the king took all the profits.

What King Richard's charter did was to give the control of this court, with all its profits, to the citizens. They for the future elected the provost, who presided over it. The fees, the fines, the tolls, passed into their hands. The laws and regulations they chose to lay down for the management of their internal affairs were no longer subject to the consent of their lord.

We may thus estimate to some extent what it was that the citizens of Norwich gained on May 5, 1194. It was not a municipal birth. They had been a "borough" for probably 200 years already. Nor was it a great municipal revolution or change of constitution. None such was made. What happened was this: Instead of feudal servants, or at best feudal tenants, they became freeholders of the city. It was as if the tenants on a large estate were told that, on payment of a fixed annual rent to the owner, they might have the estate and manage it for themselves and keep the profits. It was, indeed, only a beginning of self-government which they entered on. Their power did not extend over criminal jurisdiction. Perhaps if a thief was caught in the act they might take him and even hang him. But the right to punish all the petty offences which now come before our police magistrates was not granted till thirty years later, and numerous other privileges, administrative, judicial or commercial, were added from time to time.

In short, King Richard's charter placed the citizens of Norwich in the position of a young man just entering on the control of a large and promising piece of property. How they and their successors conducted themselves in their responsible position, what successes and failures they met with, what difficulties they had to face, and what changes they passed through, all these things have been told by Blomefield and others. Many details of how they did their work still remain to be worked out from the records which they left, and which have survived from within 100 years of this charter. It is a matter of congratulation that these valuable records will, before many weeks are over, be transferred from their present unsatisfactory receptacle to the safe and commodious muniment-room provided for them in the Castle Museum.

Looking back upon the 700 years which have elapsed since the granting of independence to the citizens, we may see that through most of that time Norwich has stood amongst the very foremost of English towns. If of late many others have rivalled and outstripped it, that is owing to natural causes which cannot be controlled. The city still ranks high, and while we wish that its prosperity may continue, we may in connection with our present subject express a special hope that it may never want wise and patriotic rulers, whose only aim shall be to administer its affairs for the increase of its welfare and for the common good of all its inhabitants.

A Meeting of the Badenoch district committee was held in Kingussie to consider offers for the erection of a new iron bridge on the Spey at Kingussie, to replace the existing timber structure. It was decided to build it at the site of the present bridge, and the committee accepted the lowest offer, which was that of Messrs. Sommerville & Co., Dalmeir Bridge Works, near Glasgow, the sum being about 3,264*l*.

EVOLUTION IN ART.

THE paper read by Mr. Henry Balfour before the Applied Art Section of the Society of Arts on "Evolution in Decorative Art" appeared in *The Architect* on April 13. Sir George Birdwood, K.C.I.E., C.S.I., presided at the meeting, and in opening the discussion said that Mr. Balfour had favoured the Applied Art Section of the Society of Arts with a paper of high scientific quality, to which they had listened with the deepest interest, and for which he had earned their most grateful thanks. It was difficult to offer any criticisms on it, for Mr. Balfour had treated his subject in so severely inductive a manner that one had to accept his conclusions, from the facts so carefully established by him, as self-evident principles. Moreover, while the traditional types of decorative art were yet in their mechanical stage, and were merely so many dead forms, and before the quickening spirit of art had breathed life and beauty into them, and they had thus become truly decorative, they excited no artistic sympathy in him, even though they might already have become symbolical. In his opinion, indeed, Mr. Balfour's most instructive paper belonged not so much to art as to ethnography, and for this reason the observations he ventured to offer would rather be round-about than on the admirable paper they had been privileged to hear that evening. The paper really dealt with changes in decorative types rather than with evolution in decorative art. The fact is that in art there is no such thing as evolution, but more or less isolated and veritable "creations"—for their law cannot by searching be found out—by men whose genius is a true divinity. These men found schools and styles, and after them begins a regular course of devolution, at every step worse devolved. This is really as true of "decorative" as of "fine" art; while the facts of devolution are even more strikingly and pertinently illustrated in historical than in unhistorical (*i.e.* "primitive" and "savage") decorative art. Thus Sir John Evans has shown (*Numismatic Chronicle*, xii. 127) the type of the laureated head on the gold stater of Philip of Macedon, in its passage through southern, central, western and northern Belgium, Gaul and across the Channel into Britain, passing through successive devolutions under the hands of its savage, or rather barbarous imitators, until it becomes in one series an ear of wheat, and in another a quatrefoil. Of course there may be change without devolution of type, and change with evolution, as when the Greeks took the symbolical palm-head of the Assyrian "Tree of Life," which owes all its interest to its symbolism, and transfigured it, unfortunately, with the loss of its symbolism, into both the "palmette" and the "honeysuckle," two decorative types of perfect beauty, and, indeed, rather created after an ideal archetype than evolved from a material prototype. For illustrations of changes in well-known types of historical decorative art he referred to the chapter on "The Knop and Flower Pattern" in his "Industrial Arts of India," and to Count Goblet d'Alviella's "Migrations des Symboles," which latter treated of the permutations of every known symbolical decorative type in at once the most learned and scientific manner. The Polynesian types dealt with by Mr. Balfour he (the Chairman) thought might be instances of evolution from devolved types, originally Indian, transmitted through Southern Asia. There was first ignorant and unskilful imitation with gross devolution of type, and from that point there was a limited degree of evolution, for the human mind, even in its lowest developments, insists on coherency and symmetry, so far as it can command them. If we will search out the absolutely aboriginal sources of decorative types we must go back to the utmost backward of the world's history, beyond the genesis of the human race, of even the animal kingdom, and trace them to the ultimate molecules of the external elements of infinite nature. There is no intermediate point of origin either in the "evolution" of decorative types or of the æsthetic sense they gratify. The æsthetic sense is, in short, inherent in nature and latent throughout nature, and he (the Chairman) would not limit the point at which it became nascent and conscious. In form, we can trace in nature everywhere a tendency to the evolution, through successive gradations, of ever more and more perfected beauty. For an instance, take the peacock's plumage—wherein we can trace, through successive steps, the gradual evolution of its decorative type, from its first remote suggestion, in a vague spot of blue on the tips of the bronzed green feathers of the body of the bird, to its final complex elaboration of form and colouring in the characteristic "eye" of the feathers of the tail; and the pea-fowl's sense of their beauty is proved not simply by the peacock's proverbial pride, but by the fact that peacocks are now all distinguished by "eyed" plumage, simply because the peahens have always preferred handsome to plain mates, and refused the latter all opportunity of multiplying their plainness. Similarly, peahens are now all dingy-hued because the more brilliantly-coloured ones were so run after by the peacocks that they were all sterilised, and long ago became extinct. This law of sexual selection reigns with rare exceptions throughout the animal kingdom below men and monkeys, and sufficiently

demonstrates the presence of the æsthetic sense throughout it. Then, passing to colour, we find in vegetation its fundamental colour to be green, but by some law that is the property of plants they all in the higher orders tend to express themselves in ever nobler developments of colour, and first, after green, in yellow, and then, through orange, in red, and through purple in blue, the noblest of all colours. Of course the unit of a flowering plant is the leaf, a tree being nothing more than a colony of individual leaves, and the successive modifications of the leaf into the calyx, corolla, stamens, pistils and ovules, or after fertilisation seeds of a flower, is simply to provide the embryo leaf, which is the heart of heart of the seed, with sufficient protection and provision against the winter and other risks to insure the propagation of the plant in the spring. These modifications imply higher and higher efforts of generative force, manifesting themselves naturally in higher and higher developments of colour as well as of form. But still it is impossible not to feel that every flower rejoices in its own beauty, and that its joy is essentially of the same kind as our own—at least, in so far as it is an elementary mood and aspect of it. Note the phenomena of the fertilisation of a flower. It is quite a fashionable wedding "feast of nectared sweets, where no crude surfeit reigns," the colours of the corolla representing the gay dresses of the bride and bridesmaids, the fluttering butterflies the banners, and the humming of the bees the marriage bells. In its anatomy and physiology, and one might almost say in its scenic arrangements and social economy, it is all one with a human marriage, and it is hard to believe, in the face of such suggestions of a universal *anima mundi*, that the predominant sentiment of the two functions is not identical, and that plants do not participate in the artistic sense common to all animals, and are not in some degree conscious of their own ministry to the beauty and nobility of the life of this world. There always seems to me more than a latent æstheticism even in gems and other crystalline and coloured stones, their very beauty being, as it were, expressive of the ceaselessly operative tendency, which might almost be called the insuppressible desire, of the whole material "creation" to realise its highest spiritual ideals.

CARPET DESIGNING.

(Concluded from last week.)

IT is, I suppose, conceded on all hands that, while there yet remains much to be done, there has been a very great measure of improvement in the design and notably in the colouring of carpets within the last twenty years. And what has been done has been almost entirely the work of manufacturers and of the designers in their employment, who have been trained and guided by them. And here let me say that the manufacturer is not marked off by any hard-and-fast line from the designer. Occasionally the two are united in one person, and it frequently happens that the manufacturer is his own colourist. If he have any natural gift for colour, which I suppose will be admitted as possible even by those who look upon him as a mere master-mechanic, it can scarcely fail to be aroused and cultivated by the atmosphere of colour in which he lives and moves. In many cases without putting pencil or brush to paper he can, and does, impart to a design all that it has of distinctive merit.

Designers and writers on design steadily ignore the fact that in a carpet form is only a secondary matter as compared with colour. This is partly because graceful forms can only be approximately expressed, and in coarse fabrics can merely be suggested, and partly because in actual use the drawing is always seen distorted by foreshortening and broken up by furniture.

To illustrate the point that colour is more important than design, I may say that not unfrequently an effect of colour is decided upon before there is any thought of a design to carry it, simply by picking up tufts of coloured yarn, as one might gather flowers, and arranging them into combinations, subject to a certain dominant scheme. When this is done, a design is drawn with the sole object of displaying these effects. In fact, design is only a scaffolding for the construction of the real edifice. I am disposed to say that in many cases form is of no more importance in a carpet than is sunset.

It is pretty obvious that writers on decorative art ignore colour because they are not themselves colourists. As I have elsewhere said, it might almost seem as if they lived in a monochromatic world, so insensible do they seem to be to the existence of colour. Now for this they are not wholly to blame, and so long as they have the modesty to recognise their own limitations, one must not be too hard upon them. The fault lies in the entire want of any provision for the systematic teaching of colour as a branch of ornament, of equal and, in some cases, of greater importance than what is commonly called design.

It seems to be thought that while drawing and composition must be carefully and systematically taught, colour may be left to take care of itself; that the colourist is born, not made; and

that, therefore, there is no use in trying to train him. The student, as he grows up, finds that, judging by the examples set before him, form is all important; and when, by-and-by, he develops into a decorative artist, or an art critic, it is not to be wondered at that colour occupies a very secondary place in his thoughts.

In my opinion, colour requires to be taught with even greater care than design, and for this reason, that the colour sense develops later than the feeling for form. There are good reasons, we are told, for believing that this is true of the race as well as of individuals, and that the Greeks of Homer's time had no true sense of colour, but only of light and shadow. Be this as it may, it is a matter of common observation that the power of drawing is usually acquired long before there is any indication of a mastery over colour. In the case of painters who have been great colourists, their early work shows no indication of any such gift.

At South Kensington there has until lately been little indication that the training of the public or of art students in colour has been present to the minds of those responsible for the collection and exhibition of that vast mass of material. The recent arrangement of the tapestries in a large well-lighted hall is a step in the right direction, but the bulk of the valuable collection of textiles is still in a dark gallery, where it is very difficult to see them. There is in the adjoining Natural History Museum a collection of minerals, many of which are so exquisite in colour that they seem to have been collected and exhibited as much for their beauty as for their scientific value. Whatever may have been the motive, there is little to compare with them for suggestiveness in the Art Museum. There colour appears, so to speak, incidentally. If an object selected for its form or its rarity has also fine colour, well and good, but there is little indication that anything has been selected for its colour alone. But the thanks of all who are interested in art applied to textiles are due to Professor Middleton for what he has done, and has been so undeservedly attacked for doing. I hope he will persevere in the course he has adopted. In the museum of a country where weaving is one of the great industries, textiles should have a more prominent place than they have hitherto occupied.

This leads me to ask, Why should we not have a colour school and a colour museum? When one thinks of what such a collection might be if selected and arranged with this sole end in view, the prospect, to anyone with a keen colour sense, may almost be called intoxicating. It need not be costly on the whole. Why should not some of the lovely effects now produced in various materials be made the basis of such a collection? One continually sees in shop windows, in all sorts of fabrics, passages of colour that would be well worth preserving. Fashion may at any time decree a return to magenta and emerald green, and the formation of such a collection as I advocate could not fail to have an effect in averting such a consummation, if fine pieces of colour, instead of being a memory of the past, were to be kept permanently before our eyes. Such a collection could not fail to have an effect, not only upon decorative art, but upon the rising school of painters. It need not be confined to manufactured articles only. Beautiful bits of natural colour, when these are capable of being preserved, might be added, such as the minerals I have referred to, with birds, insects, shells, lichens, and so on.

It may be said that all these can be found by those who have eyes to see them, but one does not follow this principle in other branches of education. If such objects were brought together and arranged with descriptive labels analysing the scheme of colour in each case, and showing by means of an example placed alongside how such a scheme might be applied, either to a picture or to a piece of decorative art, the educational value would be enormous. It is probably for the want of some such training that in the revival of the feeling for good colour, which is so marked a feature of the last twenty years, a greater number of artists have not turned to carpets. For in colour possibilities, carpets of certain makes stand at the head of all textiles. There is no other woven fabric in which the number of colours is unlimited in theory and so large in practice. It is wonderful that the scope thus given does not prove a greater attraction to those artists who are naturally stronger in colour than in design. It might be thought that in looking round for a medium in which to express themselves they would have eagerly seized upon carpets.

Such a scheme as I suggest might, if carried out, be not without influence on other arts—music, for instance, in a way not at first sight apparent. We know that Richard Wagner was unable to give form to some of his great tone-conceptions until he had arrayed his person in gorgeous colours. And so a sensitive composer straying into such a chromatic paradise as I have conceived might receive inspiration which could bring forth a great symphony. And the converse holds good, for in one's own experience music is sometimes found very stimulating and suggestive of decorative conceptions. A successful design has been originated on the back of a concert programme. But lest I may be crediting music with more than its due share of

such influence, it is only fair to say that a long, dull sermon has been known to produce a similar result.

I have said that great advances have been made in the colouring of carpets. The improvement has been mainly along two lines. First, tints more beautiful in themselves, and more suitable for their purpose, have been used, and secondly, elaborate gradation has been adopted where flat tints were once used. At one time, in making reproductions of Eastern carpets, their variety of tint was looked upon as a defect. But it has long since been recognised that perfect evenness of colour is not desirable. A great advance has been made by using gradation of colour in flat designs. In my opinion one of the reasons why many people prefer representations of raised ornament in a carpet is because of the delicate gradation of tints which is necessary to express it. I am surprised that this has not been pointed out by writers on decorative art, and that no credit has been given to those who have solved the problem of retaining all the charm of gradation and of combining this with perfect flatness of treatment, avoiding on the one hand any imitation of relief, and, on the other, the bald uninteresting effect of flat ungraduated colour.

Here let me say a word in my own defence against a possible charge of inconsistency. I have elsewhere held up French designers as worthy of imitation in their methods of representing light and shade in carpet designs; but in recommending young designers to study these methods if they wished to produce designs of a similar type, I was merely pointing out the shortest way to practical commercial success. I carefully guarded myself against expressing any approval of such designs, and made it sufficiently clear that, personally, I heartily disliked and condemned them. I imagine that the chief difference between myself and my critics lies in this, that I know there is and is likely to be for some time to come a considerable demand for such designs, and I am not prepared to advise young designers to neglect them. Their doing so would not lessen the demand, which would be supplied somehow, and the only result would be that they would find it more difficult to earn their bread and butter. The improvement in taste which—in England, at all events—we may hope to see brought about, must be effected by other means, such, for instance, as those I am now endeavouring to suggest. But the foreign and colonial trade will remain, and in some of these markets we cannot expect to see a high standard of design adopted for a long time to come, if ever. Will it be argued that English designers are entirely to neglect the only methods which will enable them successfully to cater for such markets? I am not prepared to say so.

Mr. Lewis Day confessed to a little disappointment at not having heard anything about carpet designing, which he wanted to learn about; he had only heard the "bitter cry of the manufacturer." Mr. Millar's complaints touched him personally, first as a designer; secondly, as having dabbled more or less in criticism; and thirdly, as having been one of the wicked judges at South Kensington; and he might, therefore, say a word on the other side. He did not quite agree with the author that the designer resented the conditions under which he had to design. If he was really a designer, he thought those conditions rather stimulated him. The reason why designers did not take to carpet designing was partly that it was more difficult, and required more knowledge of technique than some other things; and partly, perhaps, because so much depended on colour, and he understood that the manufacturer had that in his own hands. If the manufacturer were a colourist he might make beautiful things out of designs which were insufficient, but he might also spoil a good design, and an artist did not greatly crave to work in a medium over the final stage of which he had no control. No doubt the good manufacturer came in for some of the abuse which the bad one deserved, and he shifted the blame on to the retailer. Mr. Millar said the dealer "gauged the public taste," but in that he could not agree. He forced his own taste on to the market, and the public could only buy what the dealer provided; many beautiful things were stillborn simply because the dealer did not like them. The dealer or salesman managed to sell what he liked, and what he did not like he declared would not sell. The pattern-book was a great source of complaint to the wall-paper manufacturer, instead of an advantage, because the best things showed to great advantage in a pattern-book, and the consequence was that the worst things were bought, and, when used, were condemned. Some years ago, in criticising English art generally, he alluded slightly to carpets, and expressed the opinion that the good designs then current were mainly, if not entirely, borrowed from the East, and he was inclined to think so still, notwithstanding the very beautiful things shown to-night. The best carpets on the walls were emphatically those which were most distinctly Eastern. He might make, perhaps, one exception, that taken from a Coptic tapestry, which showed greater originality than any of the others. He did not quite know who Mr. Millar was girding at, for he did not know of any class of artists who advanced precisely the opinions attacked by the reader of the paper. He did not think any one contended that

people should always be struggling for something absolutely new, or that they should not be influenced by what had gone before. Such a thing was impossible; a man often did what he thought original, and then found it was very like something he had seen before, just as a well-turned phrase which came to him as an inspiration often turned out to be a quotation. At the same time, when a thing was too obviously traceable to its source, that was rather against it. He did not know that any one had sneered at the attempt to introduce Persian forms; designers of carpets could not do better than start with a study of the Persian, but it did not follow that they should go no farther. Nor did he think any one nowadays insisted on showing the repeat in a pattern. He had himself insisted on designers basing their pattern on a geometrical construction, but it did not follow that that construction should be obtrusive to the eye. Mr. Morris had said no doubt that it was pleasant to see a frank recognition of the lines on which a thing was designed, but that was only an individual opinion. When a manufacturer bought a design and did not produce it, it was not always the fault of the artist. He had known cases where such designs were left for years, until that particular kind of thing began to be known, and then, when it was too late, they were brought out. There was great want of pluck on the part of manufacturers. It was suggested that a school of design should be established on the plan of Mrs. Dunlop Hopkins. It would be time, he thought, for the Americans to come and teach us how to design when they had done something themselves better than we were doing already. That was not yet the case. We had a teaching institution at South Kensington. It was not his business to defend that much-maligned school, but if it was not doing what it was established to do, it would be better that it should be stirred up to do it than that a rival school should be set up. With regard to piracy, the Americans were not the only pirates. He had said that he had not designed carpets, but he had seen his wall-papers reproduced in carpets, very much to his annoyance. If the British manufacturer were in earnest in desiring honesty in trade, he would insist on having a copyright law which would protect designs of every kind. He had enjoyed the paper very much, and hoped that in criticising it he had not exceeded the limits which the author prescribed for himself.

Mr. Arthur Silver writes to the Society:—Although I can thoroughly sympathise with Mr. Millar and lament with him for the apparent scanty encouragement which is offered to the most important of our textile industries, yet, looking at the matter from a designer's point of view, I am inclined to consider that one reason is owing to the fact that designing for carpets presents more obstacles than designing for other fabrics. In the first place, he must master the technical difficulties, and possess a sufficient knowledge of working on the ruled paper. Assuming that the difficulties have been overcome, and he has accustomed himself to the work at a very considerable expenditure of time, he will find that his experience, bought at the expense of ignoring other work, is available for carpets only; whilst experience gained in designing for one printed fabric qualifies for innumerable other fabrics. Another obstacle is owing to the numerous varieties of cloths. Many manufacturers have their own special gauges, and though the character of the design may suit one manufacturer, he may not employ the gauge upon which the design is worked; this involves a serious risk to the designer. To be an expert with the ruled paper is an exclusive business, and so keen is the competition that many manufacturers who insist on adhering to a "trade" custom of buying designs by the yard would be aghast with an outsider who required the equivalent of remuneration according to the time involved. Therefore, taking into consideration the obstacles to be surmounted, the tedium of the mechanical process, the keenness of competition and the time involved in obtaining a knowledge of the various makes, and of the firms who employ them, I am bound to state that designing for carpets presents a maximum of risk for a minimum of profit, even though the "outsider" may present designs which some manufacturers will acknowledge to be entitled to payment considerably in advance of the market rates. If, therefore, the outsider who has more or less experience in the branch finds the means of livelihood barely forthcoming, I cannot see how those who occupy the greatest prominence in decorative design can reconcile themselves to the making of experiments to produce a practical drawing when other work, which under the circumstances would involve more interest to them, must remain in abeyance. I must not omit to state that some manufacturers welcome small-scale freehand drawings, which have afterwards to be translated to the ruled paper; this certainly overcomes some objections, but the method cannot be successfully indulged in until some experience on the ruled paper is first obtained, otherwise their work is liable to be non-practical. But designs in this form are only welcomed by a very few; some cannot mentally realise the actual result, and others object to the double outlay involved in transferring it to the ruled paper. Mr. Millar refers kindly to my work; it is only fair to state that such merit as it is entitled to is mainly due to his exceptional

powers of lucid exposition of the technical points. As one keenly interested in this matter, I am grateful to the Society of Arts for having brought this subject forward, and to Mr. Millar for dealing with it. Before concluding, I should like to emphasise the extreme value of the suggestion made respecting a school or museum of colour for industrial work. I trust this will be further agitated. I may mention that during the course of a year I have applications from many hundreds of students and "designers"; about 1 per cent. will exhibit a skill in design beyond the average, but not one in 500 can show an original, harmonious and practical colour scheme. This should speak for itself.

GENERAL.

The Society of Engineers meet at the Town Hall, Westminster, on Monday, May 7, when a paper on "A Deep Boring near Freistadt, Austria, by the Canadian System," will be read by Mr. R. Nelson Boyd.

The Governors of Dulwich College have arranged to open the Dulwich Picture Gallery on Sunday afternoons, from two o'clock to five, during the months of May, June and July.

An Exhibition containing over a hundred crayon portraits by John Russell, R.A., besides examples of amateurs' work, was opened on Wednesday in the Imperial Institute.

The Choir of Norwich Cathedral was reopened on Wednesday, the works of restoration undertaken by Dean Lefroy having been completed.

The late Miss Harrison, of Wakefield, has left 500*l.* for beautifying Wakefield Cathedral.

The Death is announced of Mr. David Payne, a Derbyshire landscape artist. He was the son of the late Mr. John Payne, contractor and mason, Annan. Educated at Annan parish school, he was a classmate of Mr. William E. Lockhart, R.S.A. His father apprenticed him with an Annan house-painter, and after serving his time he gave up house-painting in favour of more refined tastes. Removing to Derbyshire some twenty-five years ago, he devoted his life to painting the scenery there.

Wick House, Richmond Hill, originally built by Sir Joshua Reynolds for himself, and from which he painted his picture of the view of the Thames Valley looking over Petersham Woods, was put up to auction on Tuesday, but withdrawn at 5,000*l.*, which was the only bid.

Mr. Waterhouse, as honorary treasurer, was able to announce at the dinner of the Artists' Benevolent Institution, on Saturday, that the contributions received during the evening amounted to 1,700*l.*

The Liverpool Corporation have agreed to carry out alterations and additions to the Central Fire Station and Police Buildings, Hatton Garden, at a cost of 26,000*l.*

It was announced at the meeting of University College, Liverpool, that Mr. Henry Tate had presented to the college a list of standard works valued at about 5,500*l.* It was also announced that Lord Derby, who had succeeded his brother as president of the college, had given a donation of 10,000*l.* to endow a Chair of Anatomy.

Stables have been completed for the Glasgow Corporation in view of their taking over the tramway system on July 1. So far, nearly two thousand horses have been purchased, chiefly from Ireland.

Mr. George Simpson has been appointed burgh assessor, town architect, and practical adviser to the Leith Corporation, in connection with the Leith improvement scheme.

The Royal College of Music, South Kensington, erected from the designs of Sir A. Blomfield, A.R.A., was opened on Wednesday by the Prince of Wales.

A sum of 2,000*l.* will be required for the purpose of acquiring freehold land on which to building a vicarage as a memorial to the Rev. F. J. Ponsonby, late vicar of St. Mary Magdalene, Munster Square, and already the sum of 1,200*l.* has been collected. Mr. Andrew Oliver, of Bedford Row, has given 3,000*l.* towards the building, and operations will begin immediately.

A Committee of the Cheshire County Council have considered the question of establishing an agricultural college for Cheshire. The committee reported that the establishment of an agricultural school, with an experimental farm attached, would be of great benefit to the county, and they suggested that Messrs. Thomas Rigby and John Edwards, with Mr. R. P. Ward, the organising secretary, should obtain information with regard to suitable sites for such an institution. The report and recommendations were adopted. It was estimated that the cost would be about 11,000*l.*

The Subscriptions to the testimonial which is to be presented to the efficient secretary of the Surveyors' Institution, Mr. J. Rodgers, are being promptly contributed, and, as the list will be closed at the time appointed, any members who have not paid should not allow the opportunity to escape.

The Architect.

THE WEEK.

In the North of [England there was an agreement among architects about the abilities of FREDERICK RICHARD WILSON, of Alnwick, who died on Monday last. As an archæologist and a writer he was considered to be equal to any of his contemporaries. His knowledge of architecture was admitted, and wonder was often expressed that he was satisfied with the limited sphere for the exercise of so much talent which was afforded by Alnwick and its neighbourhood. A period of forty years had elapsed since he came there to take charge of the important works which the Duke of NORTHUMBERLAND had commanded in Alnwick Castle. Afterwards he was sent to Rome to study Renaissance work as a preparation for designing the interior decorations. In that way Mr. WILSON became closely associated as a friend and adviser with the PERCY family, and the relations between them continued to the end of his life. Before his settling in Alnwick Mr. WILSON had been engaged under Sir CHARLES BARRY and Mr. SALVIN. He was the author of several essays on archæological subjects, and his book on "The Churches of Lindisfarne," to which his leisure hours during several years were consecrated, is of great value. Mr. WILSON's energy was not confined to professional pursuits. He took a large share of the responsibilities of public life, and gained respect by his efficiency and zeal. At the time of his death he was in his sixty-sixth year.

CHARLES JACQUES, who died in Paris on Monday in his eighty-first year, was an artist who was never sufficiently appreciated by his countrymen. He was an associate of MILLET, and we believe it was mainly owing to his example that the pupil of DELAROCHE abandoned costume pictures in order to represent peasant life. JACQUES had not the pessimistic bias of MILLET. He did not consider that field work was an infliction, so he made pictures and drawings in which the peasants appeared as men and women who went through their work vigorously, as if they enjoyed it. As a draughtsman he was far superior to MILLET. The latter did not care much for action; most of his figures are standing still, or not engaged in any work which is tiring. JACQUES, on the contrary, was happiest when representing men who were reaping or threshing, and his mastery of light and shade enabled him to make the simplest scene interesting. While MILLET was supposed to be a revealer, a poet, a philosopher, JACQUES was by the majority of amateurs regarded as a sort of reporter, and his fidelity to life was valued as if it were only a commonplace quality.

THE citizens of Bristol, in common with the rest of the Western people, have gained a peculiar sort of reputation for their adherence to a belief in the advantages of slowness and sureness. It will not cause much surprise to learn that they waited until last week before erecting a tablet to record the connection of JOHN CABOT and SEBASTIAN CABOT with Bristol. JOHN CABOT was a Venetian, and as a pilot he was engaged in Bristol. From time to time he made voyages to the Western continent. His son, SEBASTIAN, with two other brothers, accompanied him. At one time it was supposed that SEBASTIAN was born in Venice, but it is now generally believed that he was a native of Bristol, and the new tablet announces that fact for the benefit of posterity. He was more than an adventurous sailor, for he was able to prepare charts, a difficult task at that time, and the penurious HENRY VII. paid him twenty shillings for a map of Gascony and Guienne. The king did not give an appointment to SEBASTIAN, who accordingly appeared to consider himself as a citizen of the world. When WOLSEY wished to organise an expedition, CABOT could not accept the leadership without the consent of CHARLES V., as he was in the emperor's service. According to the inscription on the tablet, he "sailed in the ship *Matthew*, A.D. 1497, and discovered the continent of America." That he was the first man of that time to reach some part of so large a continent is likely, but he was only one among several navigators who could claim a like dis-

inction. The tablet has been provided by the Clifton Antiquarian Club, but the people of Bristol would do well to pay for a statue of the brave man, who, as the first governor of the Merchant Adventurers, may be said to have initiated English commerce.

A MEETING of the West Riding County Council was held on Wednesday at Wakefield. The subject of the new county offices was again brought forward. It will be remembered that in March the general purposes committee recommended that the tender of Messrs. ARMITAGE & HODGSON, amounting to 72,506*l.* for the erection of offices in Wakefield, should be accepted. An amendment was, however, carried that the subject should be sent back for further consideration, with a view to the erection of the offices in Leeds. On Wednesday it was proposed that the decision to provide offices for the County Council, its committees and officers at Wakefield be adhered to. There was a long discussion, and various amendments were proposed. One was, "That the tender of Messrs. ARMITAGE & HODGSON, contractors, Camp Road, Leeds, amounting to 76,824*l.*, be accepted for the works set out in the general specification, comprising a council chamber or hall, and offices for the administrative and other work or business of the County Council." It was rejected, fifty votes being against it and twenty-three in favour of it. Finally, the original motion was carried.

THE Art Union of London was founded in 1837, and it was then considered to be especially an experiment for the promotion of art. Afterwards similar institutions were established in the provinces, in Ireland and in Scotland. The objects of subscribers were not entirely disinterested, for they had the expectation of winning a painting and the certainty of obtaining a print, but on the whole they may be credited with the intention of co-operating for the advantage of art. On that account, when the Act was passed for the exemption of literary, scientific and artistic societies from local taxation the Art Union of London could easily have obtained the advantage of it if proper application had been made. The opportunity was neglected until the present year. On Monday the Art Union appealed against the assessment of the offices in the Strand by the overseers, on the ground that the premises were only used for the promotion of art. A society that has a dual purpose always is in a difficulty in maintaining that one is paramount. While the counsel for the Art Union relied on the commissions which are given out of the funds, the counsel for the overseers of the district represented the Union as a lottery that was upheld for the advantage of the subscribers. The judges of the Queen's Bench took the latter view, and the appeal was dismissed. What is more important, the Art Union was declared to be an unauthorised art lottery. It is therefore open to any one to take advantage of that judgment, and it will be prudent for the Council of the Art Union to adopt such a course as may prevent, too, the waste of the funds on useless litigation.

ONE effect of the Parish Councils Act has been already exemplified in Stourbridge. Six years ago the Boundary Commissioners recommended that the poor law union of the district should be divided, as at present it comprises parts of two counties. Several of the guardians considered the operation ought not to be delayed any longer. One member opposed the recommendation on the ground that if unions must be always conterminous with county boundaries, it would be necessary to erect two hundred additional workhouses. As the cost of one is at least 25,000*l.*, for the sake of the building trade it is to be hoped the Boundary Commissioners will be able to insist on the realisation of their ideal arrangement. Another objection offered for deferring the dissection of the Stourbridge Union was that between old age pensions and parish councils workhouses would not be so necessary as they have been in times when there were fewer Acts of Parliament. A majority took that view, and Stourbridge may be long before it has a second workhouse. It does not matter, of course, that the existing building has been condemned, and that from its position poor people are compelled to make toilsome journeys before they can obtain relief.

PAINTING AT THE ROYAL ACADEMY.

WHEN the President of the Academy finds it necessary to give a sort of testimonial to this year's collection of paintings, and generously appeals on behalf of the young contributors, people will naturally assume that the works are insufficient to recommend themselves, and require the aid of a favourite advocate. It needs no hypercritical eyes to discern that in every one of the galleries there are representations of commonplace subjects for which compensation is not found in the manner of treatment. While so much may be admitted, the artists have a right to ask whether the average character of their works is not at least creditable to their tact as men of business? Excellent paintings have of late years failed to attract purchasers in Burlington House, and after wandering around the provinces have come back disconsolately to their creators, although they are not sure of a welcome. Is it prudent to persevere in the production of pictures that will be admired in London and country towns as if they were only elements in a spectacle, but for which nobody will give an adequate price? It is easy for right reverend divines, like his lordship of Peterborough, to descend upon the artist's task as if it consisted simply in the endeavour to express ideas; but supposing the expression is like an unknown tongue to his contemporaries? When the Bishop affirms that "Living art must always strive to enlarge the boundaries of expression, to bring new forms of knowledge, thought and feeling within its compass; it must always be struggling to catch something that has been uncaught before, to cast over each new aspect of nature or character which science has revealed or life has developed that transparent veil of beauty without which they remain alien from our sympathies," everybody who is compelled to take the world as it is must realise that his lordship is one of those patrons of art who consider it is undignified to display their esteem by drawing cheques. The ordinary buyer of pictures, like the Bishop, believes that the artist "needs to be sustained in audacity," but the test he applies is the coming down from the empyrean to his own level. The audacity which paints highwaymen, five-o'clock teas, imitations of plates of fashions, broken-down gamblers, dogs and horses whose thoughts are to be guessed, the quarrels of inane lovers and other storms in teacups, is sure of receiving another kind of sustenance than episcopal sympathy, and one that landlords, butchers, bakers and tax-collectors prefer to all other varieties. It is only necessary to look at the print-shops to discover the kind of art which is bought for enjoyment. As long as the market rules prevail, it is absurd to expect that painters will close their eyes to facts and paint what is unsaleable in order to gratify the whims of theorists, and "to soothe, to enlighten and to strengthen" worthy gentlemen like the Bishop of PETERBOROUGH, who will only "sustain" artists by an approval expressed in the finest words the dictionary affords. Although it is not of this world, even ecclesiastical audacity cannot sustain itself on conditions so immaterial.

An exhibition in which one-fifth of the contents of the principal rooms are portraits has, of course, an element which may occasionally be attractive but does not exalt. When from the sameness of subject or treatment a visitor is doubtful whether he has not seen some of the pictures at a former time, the collection in general appears to be less valuable. It must also be allowed that pictures which suit the present condition of the market are like other saleable commodities, and can only be considered in bulk; it is the abundance of the supply which is the chief source of interest. But in all the rooms, we might say in all the strata on the walls, pictures are to be found which merit preservation because they are happily inspired or reveal signs of exceptional power. Let us suppose that a representative of a municipality was authorised to expend money out of the public funds on a few works, of which the interest would not be transitory, need he return empty-handed and report that the season was unfruitful?

Following the catalogue order, he would find in gallery No. 1 *The Last of the "Florentia,"* 1588, by Mr. WATSON NICOL, an interesting example of one of those incidents which if imaginary are credible, and cast a sidelight on history. The Highlanders are raising from the shore to the top of the cliff a treasure-chest which, from its apparent

weight, contained gold that was to be used for the subjugation of England. The subject is novel and affords an opportunity to show tartaned figures in action, and the scene of the incident being on the Scottish coast, there is an opportunity for introducing both rocks and sea. Sir F. LEIGHTON'S *Fatidica* is one of three paintings of a decorative class, which are valuable as suggesting how much effectiveness can be insured by a few colours. *Tea*, by Mr. G. D. LESLIE, shows a girl in a mob cap, and the treatment of the face is very like the President's manner, but the features are English. Mr. W. LANGLEY has been hitherto known as a water-colour painter, but there is nothing of the novice about *Never Morning Wore to Evening but Some Heart did Break*. It might have been painted in rivalry with the picture which made a reputation for Mr. F. BRAMLEY. In both an old woman is comforting one that is young, and it may be supposed that the grief is caused by a shipwreck. But while the scene in one is within a room in the early morning, in the later picture the pair are seated near a quay wall in full daylight. There is not much difference in the execution, but Mr. BRAMLEY'S arrangement allows of more display of skill in light and shade. Mr. HOOK'S pictures are always welcome, and for his *Seed Time* he has travelled a little inwards. *Bolton Abbey*, by Mr. J. W. NORTH, shows also a departure for fresh fields and pastures new, since we see a place where trees are green and not brown. Another discovery is seen in Mr. BISCOMBE GARDNER'S *Devil's Punch Bowl*, for that spot in Haslemere appears as impressive as any chasm in Arran.

The President's *Summer Slumber*—a blooming girl in a pink dress, with long hair, lying near a window—is the principal work in the second gallery. As censors are unable to find fault with the figure, they have gratified themselves in pointing out the discomfort of the ledge on which she rests, but on that account the picture gains *vraisemblance*, for it can be supposed sleep came suddenly. The *St. Sebastian*, by Mr. S. GOETZE, suggests the human affection of which the Prætorian captain was the object. In the picture we see IRENE and another Roman lady adopting the simple but loving surgery which saved the martyr for a time. GUIDO, unlike the majority of old masters, suggested that only one arrow was used; Mr. GOETZE represents no more than a pair. His figures are admirable in modelling and colour. Mr. HOOK'S *Practising without a Diploma*—a girl extracting a thorn from a child's finger—is as pleasing as any of his later works. *Feeding the Pigeons in Piazza San Marco, Venice*, is a trite subject, but Mr. LOGSDAIL has suggested how well strangers can still find pleasure in the old custom.

The third gallery causes more disappointment than the others this year. Mr. HACKER, in common with the latest Associates, hardly does justice to himself in his *Temptation of Sir Percival*. The knight is without much refinement, and a frown does not impart beauty to his countenance. The painter may have, however, wished to suggest that Sir PERCIVAL, whom ARTHUR and his knighthood called the "Pure," was the sort of man who was destined to prefer the cowl to the helmet. Mr. POYNTER has of late years shared the common fate of artists who teach, for his works are more correct than genial. The young people in *Hours Serene* are proportioned according to rule, but they take their pleasure as sadly as if they were engaged in the opening dance in a modern ball-room. The colour is academic, but unluckily an *Entrance of Cleopatra in Tarsus*, by Mr. H. H. GILCHRIST—which might have been painted in Pesth—has been hung immediately over it, and by contrast Mr. POYNTER'S work appears to be only one of the productions of the Science and Art Department, with a sort of official absence of vitality. Mr. ORCHARDSON'S *James Dewar, Esq., F.R.S.*, is the better of his two portraits, and it is fortunate it is to be preserved in a building like Peterhouse College. It is not a flattering likeness, and it never could be taken for an enlargement of a photograph. What we find expressed is the impatience of the student of science, who would have students advance at electric speed in order that they might reach the shore like NEWTON, and have at least a glimpse of what law accomplishes in nature. Mr. H. MOORE is among those who have abandoned their old resorts, for in *Lowestoft Boats Running in a Breeze* he paints a sea which is less blue than

usual, and therefore 'comes' nearer to the experience of ordinary seagoers. Mr. C. W. FURZE, in his *Robert Bridges, Esq.*, has a portrait that will bear comparison with Mr. ORCHARDSON'S. The *blasé* look of the student of literature is as true as the eagerness of the student of natural philosophy. The *Orpheus*, by Mr. SWAN, seems to be the incomplete realisation of an inspiring idea, but it is doubtful whether it would have gained a place on the line if sent in a couple of years ago. The artist has not had much experience in preparing for exhibitions—that is creditable to him, and allowance must be made if he is not quite at ease in what is for him a novel position. Mr. FILDES'S *H.R.H. the Princess of Wales* is a portrait which would gain approval in any European or American exhibition. The absence of accessories seems more becoming the dignity of the subject than if they had been introduced in the conventional manner.

The Lady of Shalott is one of those unpaintable subjects which are always tempting painters. In the legend there is a vagueness which gains acceptance for it, but when the curse comes to be realised with the aid of paints, we cannot help seeing it resembles a good many of the narratives which could only pass among people who had never outgrown their childhood. Mr. WATERHOUSE is at least as successful as his predecessors, but nobody but a Japanese is competent to attempt such a subject. Few artists are as happily constituted as Mr. ALMA-TADEMA, for he never fails through an inadequate subject, and although a stranger, English weather does not appear to affect his temper, colours or pencils. *At the Close of a Joyful Day* represents a Greek girl gazing from the top of a flight of steps on the sea, and they are fortunate who will be always able to gaze on her serene beauty. Mr. WATTS has an impressive Eastern figure, a sort of JOB, as the subject of *For He had Great Possessions*. The handling is as vigorous as would be needed in a fresco of the old school.

The Summer Afternoon in the Atlantic, by Mr. SOMERSCALES, which is found in the fourth gallery, represents the Battle of Ushant in 1794. The Greeks believed that "on earth there is nothing great but man," and it is at least true in combats. In naval engagements a painter can do little more than suggest a contest between two vessels, and he cannot expect to arouse as much interest as would arise from a picture of a fight between a couple of school-boys. The proof of this fact is found wherever large numbers of pictures of sea-fights are found. The Greenwich gallery is one instance, but still more convincing is the Amsterdam gallery, for although the ablest painters were employed, the rooms containing the pictures are found dreary by the Dutch as well as strangers. Mr. PRINSEP'S reverence for womankind disqualifies him to paint such a picture as *A Versailles*. The *ménades*, or as CAMILLE DESMOULINS described them, the JUDITHS, who marched from Paris carrying young and old with them irresistibly, might be engaged in singing one of the tuneful choruses which characterise the GILBERT and SULLIVAN operas. The French painters should be acquainted with the facts, and they make the women furies; but in England we are too domesticated, too happy to be able to realise revolutionary fury. *The Close of a Stormy Day: Vale of Clwyd*, is by Mr. JOHN FINNIE, a landscapist whose reputation stands high in the North, and this picture by itself would sustain his position. Mr. DOLLMAN'S *Gold* is an experiment. Practice with a different class of subjects does not disqualify the artist to suggest the universal passion to which all things can be sacrificed. The men and women who follow and seek to impoverish the miser before he reaches the tomb are ably contrasted; there are no figures to let in the picture, and the introduction of the half-starved dog that alone appears to be honest increases the effect. The picture deserved a place on "the line." *The Ordeal*, by Mr. BOUGHTON, shows a passionless sort of woman walking through the snow reading a prayer-book, while some faggot-cutters and a jester in the background retail calumnies about her. We must confess we prefer the artist's Dutch and Puritan girls. If the foremost figure were omitted the rest of the picture might serve as a design for a Christmas card.

It is not often a gallery in the Academy contains two opposite neighbours of the character of Mr. HERKOMER'S *All Beautiful in Naked Purity* and Mr. DRAPER'S *Sea Maiden*. The former is another instance of the artist's

versatility, for it is summerly in its brightness and clearness. The girl being alone among the trees and as unconscious of shame as EVE before she received a name, the figure is a realisation of innocence rather than a representation of a mortal being. The woman who lies in the drag-net is intended to be "strange haired, with sad singing lips," but the amazement excited among the fishermen by her appearance imparts a quality to the picture which is not ideal. Mr. H. G. RIVIERE, in *The Argonauts and the Sirens*, selects the moment when the voice and lyre of ORPHEUS overwhelmed the songs of the temptresses, and there is more satisfaction in looking at his picture than at those where the men appear to be doomed.

The First Christmas Dawn, by Mr. A. GOODWIN, in the sixth gallery, was apparently inspired by the line, "Then opened Heaven's chancel while the shepherds gazed in fear." If mystics and divines as well as poets have believed in celestial architecture which was adapted for earthly uses—a city, a new Jerusalem that was to come down prepared as a bride adorned for her husband—a painter is allowed to suggest that at the beginning of our era one of the buildings was to be seen dimly by the shepherds abiding in the field. Mr. GOODWIN has done his work with due restraint. The whole picture is overspread with a fine blue, the glory that shone around, and the architectural vision is indicated with delicate and broken white lines. The scene at Bethlehem is shown below, and of course on a small scale. The painting is a daring effort, which many people will not be able to appreciate, for some will expect more definiteness, while others will object to the introduction of anything that appears made with hands in the heavens. But as the style adopted is Gothic, which of all others is most associated with religion, there is no more irreverence in supposing a correspondence between heavenly and earthly architecture than between their music. If peace on earth was announced on the first Christmas dawn, there are pictures enough in the room to show how far the promise is from realisation in the nineteenth century. By some accident or intention, the battle-pieces are placed in this gallery. Mr. S. L. WOOD represents *Horse Artillery Going in Under Fire* in a realistic way. Mr. T. DAVIDSON is no less unflinching in his *Trafalgar*, which depicts the critical moment when NELSON was removed to the cockpit. Mr. S. BERKELEY illustrates the French assumption of a *Sunken Road at Ohain*, the "pitiless chasm" which was supposed to have been one of the causes of the defeat at Waterloo. According to VICTOR HUGO, "Riders and horses rolled in together, pell mell, mangling each other." Anyone acquainted with the district is aware that the chasm was about a foot and a half deep, and yeomanly recruits would not come to grief in encountering it, but to HUGO's vision all things were on a colossal scale, and Waterloo was not a battle between ordinary mortals. It was Heaven's endeavour to overthrow the greatest of the TITANS. The little fence which would barely serve to keep lambs from straying accordingly was transformed into a pitiless chasm. It is a pity Mr. BERKELEY'S talents were not occupied with a less fanciful subject, but it must be allowed he seems to have been inspired by HUGO'S spirit. *The Black Watch at Bay, Quatre Bras*, has been painted by Mr. W. B. WOLLEN in a convincing style. A similar scene was depicted recently by an Edinburgh artist, and the painting was popular, in which officers and men displayed their coolness by being as indifferent as if on parade. At Quatre Bras men were furious. The practised hand of Mr. CATON WOODVILLE has produced the best battle-piece of the year in *Badajoz*, 1812. He represents the scene on the morning after the final attack, when the Iron Duke, or rather Viscount, was overcome by the signs of destruction. Grim visaged war there reveals itself, but something still worse could then be witnessed within the town. It will be said that sieges and battles are preferable to the terrible exercise of power over weakness which Mr. J. S. SARGENT has derived from ancient examples for his *Lunette and Portion of Ceiling* for the Boston Library. Decoration can rarely be judged piecemeal, and without some indication of the general scheme, the part exhibited can only be described as a strongly coloured adaptation of Egyptian and other figures.

The seventh room contains Mr. STANHOPE FORBES'S

Quarry Team, a strongly painted group of horses dragging stone over rough ground. Higher skill is seen in Mr. CHARLTON'S *After the Battle: Sedan*, where the riderless horses are shown in a mad gallop across the battle-field. Mr. SEYMOUR LUCAS has returned to the Elizabethan period, and has found another subject in the preparation to meet the Armada. *The Call to Arms* is an illustration of MACAULAY'S ballad, and represents the Sheriff calling on the people of a town like Dartmouth for volunteers. As usual, every figure and every costume are carefully prepared.

In the eighth room, the *Child Enthroned*, by Mr. T. C. GOTCH, resembles a May Queen that was before exhibited. The child has a girl's face, but being seated in an uncomfortable chair, wearing a sort of cope, and having a nimbus, we assume the child is no mortal being. The dress is a credit to the artist's painstaking toil. *Psyche before the Throne of Venus*, by Mrs. H. RAE, corresponds with Mr. MORRIS'S Chaucerian version of the scene, and therefore the figures are only of a mortal type.

Among the remaining paintings there are not many works which our imaginary agent would covet, but in at least eight of the galleries he would find examples that would be creditable acquisitions for any public gallery, and therefore worthy of forming part of any private collection.

SOCIETY OF ARCHITECTS.

AT the meeting of this Society a paper on "The Influence of Freemasonry on Architecture" was read on Tuesday night by Mr. D. F. Ranking, Mr. George Highton, president, occupying the chair.

Mr. Ranking said:—I hardly know whether the title which I have given to the few words you have kindly allowed me to present to you this evening may not be somewhat misleading. When one speaks of the influence of Freemasonry on architecture, the mind not unnaturally turns to Freemasonry as it exists to-day, with its vast organisation both social and charitable, its multifarious degrees and ceremonies, its lists of titled members, and its claims of descent in unbroken line from the builders of Solomon's Temple, if not from the builders of the Tower of Babel. But my intention is not to touch on the somewhat mythical, and certainly quite unsupported claims of the present Freemasons to represent a school or college of architects, who are said to have carried the science throughout Europe, if not through the world. We may, I think, dismiss any theory of such supposed origin, whether Roman, Collegium, Culdees, Benedictines, or what not, as purely fanciful. I would propose rather to speak of the mysticism to a portion of which, at least, the masonic bodies are the heirs, and ask you to consider whether the idea of embodying in actual lasting form the doctrines taught by this mystic philosophy may not, in some measure, account for the sudden rise and development of what is usually known as Gothic architecture.

It never seems to have been satisfactorily settled why the type of ecclesiastical architecture should have undergone a change in the twelfth and thirteenth centuries; to what this change owed its origin; or why it should show its most strongly-marked features in one part of Europe while in other parts it failed to establish itself or ever become naturalised. There has been a general tendency to trace the change in general form back to Eastern sources, but no good reason has been given for supposing that it came from thence, save the idea that the Crusaders may have brought back with them the forms of Saracenic architecture.

Payne Knight, in his "Principles of Taste," ascribes the origin to the corruption by Saracens and Moors of the Classical architecture of Greece and Rome. Kerrich, in the "Archæologia," derives the shape of the arch from the "vesica piscis," and he was not, perhaps, very wide of the mark. Governor Pownall, in the "Archæologia," considers it to be the imitation in stone of timber construction. Stukeley, in the "Itinerary and Archæologia," states that Pointed architecture was originally brought from Arabia, where it was derived from the imitation of groves of trees.

The spread of the new style has been credited to bodies of travelling freemasons, working under the direction of monks, and carrying certain traditional rules and secrets from country to country. Pownall says that the Collegium, or Corporation of Freemasons, first formed Gothic architecture into a regular and scientific framework by applying the models and proportions of timberwork to stone. They are said to have been formed into a corporation by the Pope, and to have been first established in England about the early part of Henry III. It has been objected to this that the Church would not have called in a body to aid in building Christian churches which, if it existed at all, was of Gnostic or Manichæan origin.

It is also said that the resemblance between the specimens of the style in different parts is not sufficiently close to justify the idea of a common origin or a united brotherhood engaged in building; the Scottish Gothic differs from the English, the French differs from the German, and both from the Flemish. As for Italy, which should have been the centre of ecclesiastical architecture, Gothic architecture never appeared but as a foreign importation, generally the work of German architects, and never established its ground far beyond German influence. Dean Milman says, "Rome is the city in which Gothic architecture has never found a place, and in the rest of Italy it has never been more than a half-naturalised stranger."

The cradle of Gothic architecture was the north-east corner of France; thence it spread over North France to the Loire, through the country of the Langue d'Oïl, and on to the Langue d'Oc; it also spread northward to England and Scotland, and east to Germany.

In France, St. Denis was built in 1135, and was followed by the cathedrals of Rheims, Chartres, Bourges, Amiens, Notre Dame at Paris, and St. Ouen at Rouen.

In England, between 1150-90, rose Kirkstall, Fountains, Darlington, Llanton, the entrance to the chapter-house of St. Mary's at York, portions of the Abbey Church of Selby, the choir of Canterbury, and the chapter-house of Lincoln, between 1186-1200. The transepts of York were raised between 1215-56. The west front of Peterborough between 1200-22, and Salisbury between 1220-58.

Scotland was affected as to the spread of the new architecture by its distance from the rest of the world, and by constant internal troubles, but Kelso was built in 1128. Kirkwall, begun in 1138, was not finished till 1540. St. Andrews was built between 1163-78.

In Germany the church of St. Elizabeth, at Marburg, dates from 1235.

This great outburst of magnificent church architecture during two centuries might seem to point to a wave of pious enthusiasm passing over Europe, and manifesting itself in the erection of buildings symbolising in their main arrangements and ornaments the great truths of Christian doctrine. My own belief is that, on the contrary, this new architecture was in its character essentially anti-Christian, as Christianity was taught by the Church. That it was indeed entirely symbolical, but that the symbolism was of a strongly Gnostic and Manichæan character, and entirely opposed to the doctrine expressed by the altar within the churches. I believe that the whole symbolism is pantheistic in a sense, and intended to teach, in opposition to the orthodox Trinitarian theology, the doctrine of the existence of a dual creative power; of one central, ineffable deity, from whom proceeded numberless lower intelligences, and of a central, correlative power of evil, existing of necessity because of the existence of good, and therefore coeval with good. The chief symbols used to express these doctrines would be the cross, the plan of a double cube, the circle, the rose, the equilateral triangle, the pentagon, the hexagon or double equilateral triangle, and the vesica piscis.

I am well aware that to all these figures a Christian symbolism is given; but my contention is that such is not the true and original symbolism, nor is it the sense in which they were intended to be read by those who first introduced them into European architecture.

At the time when Gothic architecture took its rise, two strong anti-Christian influences were beginning to make themselves felt in Europe. The Crusades had brought numbers of the knights into contact with Oriental philosophy, and with the remnants of the neo-platonic schools of Alexandria. At the same time the mystic doctrines of the Jewish Kabala were first being publicly set forth after being, according to the Rabbis, handed down as a secret knowledge for centuries. These systems acted and reacted on one another, and borrowed from each other doctrines and symbols. Thence was evolved a system of philosophy, partly compounded of Gnosticism and Manichæism, partly of Kabalistic tradition. This philosophy dealt largely in symbols and veiled, in fact, the whole of its teaching in symbolic figures. The main points of its teaching were the existence of a central all-embracing deity, who, being infinite, could not himself create, since creation implied limitation. From this deity, called by the Kabalists the Ain Soph, proceeded two creative deities, male and female in nature, and from these again proceeded others, making in all ten, known as the Sephiroth. These together formed the creative intelligences by whom the worlds were created. Since all forces in nature are equal and opposite, the existence of good necessitates the existence of evil; therefore evil was not rebellion against good, but an equal antagonistic power, absolutely necessary for equilibrium. Everything in nature owed its origin to the creative power of the active and passive principles, the male and female Sephiroth. The active principle was symbolised by fire, a perpendicular line or an equilateral triangle, placed on its base; the female principle by water, a horizontal line or an equilateral triangle, placed on its apex. The cross, one of the most ancient known symbols,

to them represented creation, the union of the active and passive principles of nature. This same sign, when taking the form of the Tau cross, and combined with the vesica piscis, gave the shape of the sacred Egyptian "Anch," the emblem of creative divinity. The union of the two equilateral triangles had a double meaning; when used of divinity it represented the struggle between the good and the evil principles of nature. It might also be read as of humanity, signifying the perfect archetypal man. Man was with this system neither a material unity nor a trinity of body, soul and spirit, but a being of a sevenfold nature, compounded of three divine principles and three earthly principles, kept separate by self. When the self was overcome and the lower principles were united with the higher, the perfect man resulted.

Man was also represented under the form of the microcosm, or pentalfa, the five-pointed star, which represented man with his five senses, and when placed within the circle represented the dominion of man over the universe, of mind over matter. The rose was one of the most sacred symbols, if not the most sacred; it represented in one light the Ain Soph, the eternal and unchangeable supreme; in another view it represented, like the vesica piscis, the female power in nature. The greatest mystery of all, that of sacrifice, was symbolised by the union of the rose and the cross. The Sephiroth, or creative intelligences, were arranged in three rows, called pillars; three, Wisdom, Love, Firmness, forming the left pillar, called the Pillar of Mercy; the three, Intelligence, Justice and Splendour form the right pillar, called that of Judgment; while the three, Crown, Beauty and Foundation, formed the middle pillar of Mildness. The tenth Sephira, Malkuth or kingdom, the world of phantoms, surrounds all in the shape of the vesica piscis.

In the early days of Christianity the shape of the building for ecclesiastical ceremonies did not matter. The whole doctrine centred in the altar; there was the only lesson to be taught, and it was the main and only thought of the worshippers. Therefore no change in the form of the building which contained the altar was necessary; development there might be, and additional magnificence, but the building itself was intended to teach nothing, since the only lesson was that of the altar. But when the West came in contact with the East, and the doctrines of the Church became mingled with the mysticism of neo-Platonists and Kabalists, the whole current of thought was changed among those who were imbued with the new ideas. The altar still maintained its chief position, but not as the sole object of veneration and source of teaching, but as one; perhaps the last link in a chain of symbolic teaching of an esoteric character, understood only by the initiated. That it might occupy its proper place in this scheme it was necessary that the building in which it stood should also symbolically show the chief points of this doctrine, which were, as we have seen:—

1. The Ain Soph, or supreme power, represented either as all embracing and quiescent by the circle alone, or the circle with the iod as its central point, or as giving forth as emanations the creative Sephiroth, when the rose became his symbol.
2. The Logos, or first emanation, from which proceeded the male and the female Sephiroth, wisdom and intelligence. These three together formed an equilateral triangle.
3. The union of fire and water, or the active and passive creative principles, symbolised by the cross, also by the interlaced triangles.
4. The existence of an active antagonistic principle to the first triad, shown by the reversed equilateral triangle. This was also symbolised by the black and white banner of the Templars, and by the grotesque devils used in ornament, most plainly in the devils of Notre Dame at Paris, which are reproductions of the Goat of Mendes, which the Templars were accused of worshipping under the name of Baphomet.
5. The supremacy of man in the material universe, shown by the pentalfa, and especially by the pentalfa in the circle.
6. The existence of man as the product of the contest of good and evil, and the possibility of perfection by the overcoming of self, shown by the interlaced triangles again, especially when placed in the circle.
7. The female creative power, the central point of Gnosticism, represented by the rose, which bore in this sense the same meaning as the lotus of the Indian and Egyptian mythologies, and by the vesica piscis, shown by the pointed arch, which also represented the tenth Sephira, Malkuth, the kingdom, the world of phantoms.

Now, who would be likely to take in hand the spread of these new doctrines? I think there is no doubt that there was but one body in Europe sufficiently learned, sufficiently daring and sufficiently powerful to do this. It was the Knights Templars. The symbolism, if so, should be found worked out in its completeness in the Templar churches. They were always accused of being tainted with Gnosticism, Manichæism and Judaism; and, so far as we can judge now, the accusations were well founded. My own belief is that the builders of the time learned the symbolism, but very likely not its meaning,

while engaged in construction under the orders and directions of the Templars, and that only in the buildings carried on under such conditions will the symbolism be found at all complete. When not working under such conditions the builders would make use of the forms they had been taught, but would combine and vary them as they were led by individual fancy, being guided by no fixed laws. With the fall of the Templars all guidance would cease and variation would be unchecked.

The doctrines remained as secrets with the Templars and Rosicrucians; and personally I look on modern freemasonry as representing the union of these esoteric bodies with the political secret societies of the Lollard type; and later, but not till the seventeenth century, with the craft guilds. The circular portions of the Templar churches I look on as undoubtedly Gnostic and Kabalistic in symbolism, as also the rose windows, such as those of Chartres, Westminster, York, Lincoln, Chichester and Lichfield.

No doubt these crude ideas of mine will seem to you, as practical men, highly fanciful, but failing better explanation of the reason for the rise of a new style of architecture, I submit it to your notice as a possible, if not probable, explanation.

At the conclusion of the paper Mr. E. J. Hamilton, vice-president, proposed, Mr. Walter Davies seconded and Messrs. Geo. Holland, Henry Lovegrove and H. G. Quartermain supported the vote of thanks, which was carried with acclamation.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on the 2nd inst., when Mr. Blanc, A.R.S.A., read a paper on the "Ecclesiastical Architecture of Scotland in the Fourteenth and Fifteenth Centuries." In studying Scottish architecture, he explained, he had been led to disagree with many writers on Scottish ecclesiology, and his object was to endeavour to trace to what extent Scottish church architecture in the period under review might be considered national. In the twelfth and thirteenth centuries church architecture, in England and Scotland both, had advanced on the same lines; but at the end of the thirteenth century friendly communication between the countries had been interrupted, and Scotland and England practically became separate countries as regards arts and literature. During the next hundred years, while England had passed into a new period, little or no progress was made in Scotland in church building, and when at the beginning of the fifteenth century Scotland began rebuilding, she had lost hold of her traditions of art, and was compelled to go back on the remains of the edifices in her midst for suggestion. England was then in the full flood of her third period, but in Scottish work none of the styles current in England were much expressed. Only in one or two cases was found the influence of the English Perpendicular, and the same was true of the French Flamboyant. Generally speaking there were to be found several features that might be said to be Scottish which had no prototype elsewhere, but were simply evolutions from existing material, and the chief influence was in the English decorative work. The lecture was illustrated with limelight illustrations, and one of the points which Mr. Blanc insisted on in his explanation of these was that Roslin Chapel was due to home influence.

TESSERÆ.

Egyptian Architecture.

THE Egyptians, of all nations, seem to have built and planned with the most exclusive regard to permanence. They designed to make antiquities. A dim bewildered instinct, a yearning after immortality, was the *primum mobile* of all their undertakings. They preferred an unconscious existence, in the form of hideous mummies, to utter dissolution; they feared that the bodiless spirit might lose its personal identity; and expected, or wished, after the expiration of the great cycle, to find all that they had left exactly as they left it—the same bodies, the same buildings, the same obelisks pointing at the same stars. Strange faith—that the soul, after all varieties of untried being, would return to animate a mummy. The Greeks built for beauty, the Romans for magnificence, the Orientals for barbaric splendour (the Chinese, indeed, for fantastic finery), the Gothic nations for the sublimity of religious effect or martial strength; a Dutchman builds to please himself; a sensible Englishman for convenience; others of that nation to show their wealth or their taste. But the Egyptian built in defiance of time, or rather propitiated that ruthless power, by erecting him altars whereon to inscribe his victories over all beside.

Imitation and Creation.

Novelty and beauty excite admiration, and naturally produce imitation; but this will be only for a time, for we should not be human beings if we finally did not endeavour to strike out a new path for ourselves; and then it is that we

shall bring to bear our knowledge, not for the purposes of imitation, but progress. With all just deference to the studies of our predecessors, with all our admiration for the styles of the past, our present object should be to consolidate and arrange the information we now have. From the lessons thus gained, the examples thus given, let us strike out a new path for the powers of the architect, and bring back the art to its normal state, which is one of gradual but sure progress, founded on scientific and artistic knowledge. We should perceive that merit exists more or less in all styles, and is irrespective of fashion, which is mutable and often unjust; that the principles of our art are fixed and certain; that however much long-received rules may be altered as circumstances may require, they are not to be despised or disregarded without careful consideration; that true construction is the vital principle of real progress; and that, besides the excellent and numerous examples of ornament we already possess, nature has still varied and inexhaustible resources in store for our study; and above all, that for the appliance of these means at our disposal, an earnest study, a just appreciation, a practical knowledge of all art are indispensably necessary, and can only be obtained by an industrious use of the hand and of the eye, as well as of the mind.

Romanesque Church, Granson.

The church of Granson is situated on the bank of the Lake of Neuchâtel, and is an instance of the use of the materials of some Roman building. The plan is cruciform, with aisles and a central tower. The nave has very small round arches, quite plain, carried on tall round pillars, which are evidently Roman work and are of different lengths, the bases being stilted more or less to accommodate them, and to make them range at the top to receive the arches. The capitals are well sculptured, with bold foliage deeply cut; the greater part are evidently Roman, but some are carved with figures of different kinds. One has the two horses rampant, back to back, and held together—an allegorical design very common in the South of France



NAVE, GRANSON.

in work of the eleventh and twelfth centuries. The vaults are barrel-shaped, carried on arches. The aisles have arches recessed in the walls, carried on pilaster shafts, the capitals of which may be early, but the bases are late, with deep hollows and corner ornaments. The aisle-vaults are a segment of a circle. The central tower is carried on four round arches, on massive square piers, with moulded imposts. The central vault is octagonal and domical, with a round opening in the centre. The upper part of the tower is of the thirteenth century. The first bay of the choir is early work, with a pointed barrel vault, the eastern bay of the thirteenth century, and very like English rude country work. The transepts have the western walls belonging to the old work and the eastern side, of the thirteenth century. The old work is probably of the eleventh.

Plurality of Styles.

The great prototype of architecture, nature, has many styles of beauty and employs them all. The horizontal, arcuated and vertical, or pointed styles, all find precedent in her domain; and though it could be proved that the Gothic was beyond all comparison superior to any other style in capability of the grander qualities, yet it would be opposed to all natural teaching to claim for it the sole and universal empire. Architectural practice should not only not be confined to one style—it should not be confined to any number; for beauty resides not in style, but in a vital principle that existed anterior to all styles, and to which all true styles owe their origin. A building might be so designed as to betray no trace of any style now existing, or that ever existed in the world, and yet be true architecture. It belongs to the very idea of a fine art, as distinguished from the mechanical ones, to yield a boundless scope to the inventive faculties throughout. There is an architectural beauty that will charm the sight and operate upon the mind like ceaseless music, that arises solely from the symmetry of proportion and form, and owes nothing to the trappings of decorative style. Erections which are never included in the category of artworks, such as some of our great chimneys, from geometrical beauty of plan, elegance of contour and a soaring height, often display higher qualities, reaching not unfrequently to sublimity, than the majority of church steeples or other buttressed or columnar erections can lay claim to. But the Greeks, the Romans, the Goths and others, we are still told, had but one style. It cannot be denied. But what have we to do with that, except to be thankful that it is not our case, and that we have many? Perhaps, too, they (the Greeks and the others) would have been glad to see our day of many styles. Perhaps in our plurality of style lies our best chance of going beyond them. A plurality of styles should certainly let us more into the central spirit of architecture than any one style could do. The best Gothic architect and the best Classic architect is the man who has studied both styles; who has examined the peculiarities and mastered the principles of all styles. He will best understand the great central art of architecture, which is neither Greek nor Gothic exclusively, but both, and much more, and the universal adoption of any one style to the abandonment of all others would not be progression, but retrogression.

Milizia's Writings on Architecture.

In architecture Milizia is remarkable for the boldness of his original speculations. He seems to have been a man of a powerful understanding, not very patient of labour; confident in himself, not taking up opinions on the faith of another, and never hesitating to expose and to defend his own. Architecture exactly wanted such a writer. It was in a languid state in Italy, vibrating like politics and religion between a slavish adherence to rules not understood and entire license. He who had liberated himself from these arbitrary shackles considered himself free from all restraint, and never thought of being reasonable, either in his submission or rebellion. Milizia applies reason to everything, and his fault is in being too reasonable; that is, in endeavouring to found upon reason certain practices which are only conventional, and which we follow because experience has shown that they please, without our being able to assign the cause of this pleasure. He writes with spirit, and frequently with a severe sarcastic wit, which will insure his being read; and he possesses a singularly happy and forcible mode of expression, to which the Italian language in his hands seems wonderfully suited. Had he written in one of our northern languages, he would have been frequently forced and harsh, and it would be difficult to translate him and preserve any portion of his spirit without falling into this defect. Though strongly vindicating his own freedom, he is much inclined to lay down arbitrary rules for others, and even to applaud a despotic exertion of the authority of government in matters of taste, not considering that the true use of rules is to guide, not to govern us; that they are merely the direction posts which mark the road pursued by some of those who have advanced farthest towards the conception of perfect beauty. Other and even better roads may possibly exist, but it does not show good sense to be ignorant of what has been proved good, or to desert the known track without well understanding what it is and what direction it takes, as well as the nature of the country we have to pass over.

Piling of London and Waterloo Bridges.

In Old London Bridge the original piling was never disturbed; the true bearing of the piles, though they existed only at the outsides of the foundations, was sufficient, and the starlings, sheet piling and filling in were only adjuncts to the strength, and were necessary only on account of the extra weight in width, and the structures upon the bridge which were added from time to time. These piles when drawn were as sound as when put down, and though upwards of six hundred years old they were convincing proof of the permanence of pile foundations when thoroughly embedded in the earth. Waterloo and London Bridges, which were both built by John Rennie,

have the same kind of foundations. The entire area of the bases of the piers is piled with elm piles, about 20 feet long and about 3 feet apart, and which penetrate the London clay, in the case of Waterloo Bridge probably to a depth of 18 feet, and in London Bridge about 18 feet 9 inches or 19 feet. On the heads of these piles were laid sleepers, and the loose earth between their heads was replaced with rubble concrete, on which blocks of Bramley Fall stone and brickwork filled up the spaces between the pile heads, immediately below the platform of oak planking which carried the first course of granite masonry. The pressure upon each pile in London Bridge has been estimated at 80 tons, or about 5 tons per foot superficial on the entire area, and this is considerably below what the piles would actually carry. The difficulty of applying sufficient dead weight upon piles, to ascertain their bearing powers in equilibrium, has always prevented the formation of any formula or data on which engineers can base their experiments. The piles are driven, and the pressure they must be sustaining is then calculated after the load is on, no maximum having been ascertained. The pressure upon each pile of Waterloo Bridge is probably somewhat less, but still it must amount to at least 68 tons. London Bridge has a close pile sheeting all round the platform, which penetrates about one-third of the distance of the main bearing piles. Waterloo Bridge does not appear to be so protected, yet London Bridge after the removal of the cofferdams settled in every pier from 6 to 10 inches towards the down stream; this was attributable to the entire area of the river substrata finding their proper bearing after the disturbances to which they had been subjected by the piling of the cofferdams and of the centerings. The cofferdam above bridge was in 35 feet of water below low-water mark, and the piles were consequently very deeply driven, and though those which were near to the piers, or could apparently affect them, were not drawn but cut off, the mass of the clay had received a disturbance which settled itself probably once and for ever, and if the bearing areas and the tenacity of the piles are sufficient for the superincumbent pressure, no further settlement need be apprehended.

Collapse of Buildings.

The records of failures in the Middle Ages rather indulge in religious than in practical explanations of the causes, and so we do not gain much practical knowledge from these examples, such as the fall of the towers of Winchester Cathedral in the twelfth century; of Gloucester Cathedral, in 1160; of Worcester Cathedral, in 1175; of Evesham, in 1215; of Dunstable Priory, in 1221; the smaller towers of Worcester Cathedral, in 1222; the tower of Lincoln, in 1244; of Ely Cathedral, in 1322; of Norwich Cathedral, in 1361; and the west front of Hereford Cathedral, in 1786; the central tower at Hereford would have fallen had not its impending ruin been observed and remedied. The old tower of Thurston Church, Suffolk, fell in 1860. Then we have the Chichester tower in 1861. The above small list of towers awakens the thought that special care is needed for all structures that are carried upon piers instead of upon continuous walls. But the description that has been given of the cause of failure in the Chichester tower would have been very applicable to many of the other cases. The lesson derived from the Chichester fall seems to be that rubble masonry should never be used in piers carrying towers or other heavy work; it is a masonry suitable where bulk and weight are main objects, but it is inadmissible where unyielding vigour of pier is to be attained; it also suggests that in any such case a soft kind of stone is scarcely safe even if it be of a sound nature; and the stone forming the facing at Chichester, though in some respects a good stone, was not suitable for a position where a crushing force was the chief force in action. It was from near Binstead, in the Isle of Wight, and it is the only tertiary building stone in England; but if we want a thoroughly good freestone we must get it out of the secondary beds. The stone in the piers of the French Panthéon was of a rather weak quality, but that with which the inner and intermediate domes were formed was tertiary, from the quarries of Conflans, about eighteen miles from Paris, and for which latter purpose it is particularly suitable.

Theory and Practice.

It has been remarked by Professor Willis "that there still remains amongst self-taught practical men too much of the ancient contempt for theory and an overweening and conceited value for facts or practice." This arises, in great measure, from a misconception of terms; the self-taught practical man generally confounds theory with hypothesis, and is unaware of what is really meant by the term theory or science. For if science be correctly defined as "the knowledge of many, orderly and methodically digested and arranged so as to become attainable by one," and the "practical knowledge" of the self-taught man as the personal experience of a single man in a necessarily limited number of cases, lacking the aids to orderly and methodical arrangement and analysis afforded by a mathematical and scientific training, then it follows from such

definitions that "science" includes "practice" in its widest sense; and that the so-called "practice" on which the self-taught man so much prides himself is neither more nor less than an imperfectly methodised contribution to "science." In short, as has been well observed by our ingenious neighbours, "*la théorie c'est le général; la pratique ce sont les soldats*"; and to talk of theory and practice as if each were a complete and rival entity is as absurd as to suppose it possible that an army could be completely and efficiently composed either of officers without private soldiers or of private soldiers without officers. Moreover, in point of fact, no practical man is ever really contented with the narrow basis of his own individual experience, but, on the contrary, he habitually makes use, in every work he carries on, of the formulæ or mathematical generalisations deduced by theorists from the careful consideration and collation of an extended basis of practice. The self-styled practical man is therefore not one who can afford to dispense with science, but one who is restricted in the application of science to construction by being obliged to get his science secondhand. It is true that formulæ, when of established accuracy, are often made use of secondhand for the purpose of saving time, by the scientific engineer as well as by the merely practical man, but the latter labours under the grave disadvantage of being only able to use them mechanically. He is unacquainted with the processes by which they were deduced from facts, and unable to detect or correct any errors they may contain. Still less can he frame fresh ones for himself. Like David with Saul's armour, he has not proved his weapons, and cannot therefore be expected to use them to so much advantage as one who has.

The Roof-Sculpture of Milan Cathedral.

As you walk along those white marble terraces, mounting ever higher, you see below you the rich level plains of Lombardy, teeming with villages and churches and cities, with their long busy white roads, with fields and groves and glistening rivers stretching far away and on into the distance, until at last the dark purple of the horizon lies sharp against the clear circling blue of the sky, and the world seems ended, a perfect circle everywhere, except to the north, for there a veil of white mist conceals it, and far above that mist the snowy summits of Alps upon Alps hang, in their glittering majesty, high up against the sky. Not less silent and unchanging stand the victorious saints, in white and glistening raiment, on countless pinnacles, on every side, above, below and around you. Some of them are leaning on the spear, or sword or cross, by which they died; others bear the palm-branch, which marks them as conquerors. Even without these tokens, and without the angel figures which bear them company, their countenances alone would tell you they are conquerors—conquerors over doubt and sin, over sorrow and pain and death, over themselves; their whole being is satisfied, all the stains and the weariness of their warfare are past and over; they rest as those may rest who have heard the words, "Well done, good and faithful servants." They rest, and yet they watch, as men that wait, without a shadow of impatience, without a shadow of doubt, with all the certainty of those who know in whom they have trusted. You turn again to the towering Alps, and by the side of that steadfast strength, that deep peace, that immoveable faith, even the mountain peaks seem to you weak and unstable. The execution of some amongst these statues is very unequal, but the idea, the truth sought to be expressed, is unmistakable.

Decorated Mouldings.

We sometimes meet with mouldings of much earlier or later date than we should have expected from other characteristic marks in the building, and there are not a few instances in which without the aid of such marks it would be impossible to say whether a moulding is of the fourteenth or the fifteenth century. In fact, this science does not appear capable of more than general treatment, though there is quite enough of uniform system to enable us to apprehend the broad distinctive principles which obtained in the different periods. Generally, then, we observe much greater geometrical precision in drawing both the hollow and the projecting members than prevailed in the preceding style. Segments of circles, both concave and convex, were much used, and there was a softness of blending, a delicacy and gentleness of grouping, an avoidance of strong and violent contrasts of light and shade, which imparted a more pleasing, though much less striking effect. There can be no doubt that the perfection of moulding, as of all architectural detail, was attained in this style. And yet rich Decorated mouldings are of rather rare occurrence. A great many of the finest buildings in this style scarcely afford as good examples of mouldings as the smallest and humblest church of the Early English age. Very often plain chamfers are used in all the windows, doorways and pier arches, while minor parts, such as bases, capitals, sedilia, sepulchral recesses and the like, have fine and elaborate details. It is in this kind of work that we must look for the best mouldings in the Decorated style.

NOTES AND COMMENTS.

SOME time ago a dispute arose between the heritors or property owners in the parish of Kinghorn, in Scotland, and the local Presbytery respecting the parish church. The latter body came to the conclusion that it would be wiser to abandon the existing building and erect a new church, because the alterations and repairs required to make the old church sufficient and serviceable for public worship would cost as much as a new edifice. The heritors, however, objected to the erection of a new church, and preferred to repair the old one. Litigation began, and the Sheriff commissioned Mr. SYDNEY MITCHELL, architect, Edinburgh, to examine the old building, and report as to the cost to make it "sufficient and serviceable for public worship," and also to estimate the cost of erecting a new church. Mr. MITCHELL considers the heritors' offer will not make the church "sufficient and serviceable for public worship." He is, however, of opinion that the present church can be repaired, and that at a less cost than it would take to erect a new church. He proposes very extensive alterations on the present building, both internally and externally. The outlay to accommodate 756 sittings as at present, or 684 as to space now allocated in erecting new churches, would be 1,700*l.*; or for 550 at the wider space, 1,300*l.* The cost of a new church, including expense of site, boundary walls, &c., to accommodate 700 people, he estimates at 3,200*l.*; 550 people, 2,600*l.* The Presbytery have no objection to Mr. MITCHELL's plan to repair the old church being carried out, provided it be remitted to that gentlemen to see the work done according to his report and plans. The heritors prefer to carry out the repairs themselves, but it has been decided that Mr. MITCHELL is to have the charge of the works.

THE series of reproductions of Japanese designs produced by the Librairie de l'Art has been completed. The subjects comprise flowers and plants, birds, animals and fish. They are all taken from fine examples, and the eight parts which are obtainable for twelve francs form a collection that will enable a student to appreciate Japanese skill. The copies of quadrupeds cannot be considered as always successful. Cats, tigers and monkeys appear to be the most suitable models for the Japanese. They have more success when sketching birds, and they are unequalled in suggesting the character of fish. The fine curves that are formed when in motion and the scales appear to have had at all times a fascination for the artists. Apparently too much time cannot be spent by them in elaborating the details of flowers. The dated examples extend from the beginning of the eighteenth century, and all appear to have been produced prior to the introduction of Western notions into Japan. As a corrective to the heaviness of treatment which is too common a result of English teaching, there can be nothing better for ornamentists than an appreciative study of Japanese designs.

THERE is the usual Celtic indifference to consequences apparent in the organisation of the Dublin Fire Brigade. For a city containing so many houses it is believed that twenty-eight firemen are an ample protection. Fortunately many of the buildings are of the flimsiest construction. When one is attacked it quickly collapses, and in that way the risk of an extension of a fire is minimised, and the few men that are available are able to cope with the smouldering *débris*. The fire that broke out in one of the largest drapery shops, or "monster houses," in Henry Street on last Friday morning afforded a lesson to the authorities and the people which should be studied. At 1.14 A.M. intelligence was given, and with commendable activity the operations of the firemen began four minutes afterwards. In about twenty minutes a large part of the building had collapsed, and the efforts of the firemen were concentrated on the preservation of adjoining property. One of the town councillors considered it was "a veritable miracle" that hundreds of lives had not been lost, and the Lord Mayor, whose faith apparently is less simple, said that "whether the result was due to the brigade or to Providence, it was a remarkable thing." Another councillor considered that, owing to the inefficiency of the brigade, the whole street was likely to have been destroyed if the building had not collapsed

immediately. The loss to insurance offices will be enormous, but if they will persist in making little difference between stable and unsound construction they must abide by the results. In the Dublin fire the building offered so little resistance that the firemen were beaten back within five minutes after the hose was laid down, and the captain considered it was hopeless to attempt saving the place. The Lord Mayor proposes, as a means to insure the city, that fifty policemen should be taught the firemen's drill, but when "monster houses" become ashes in a few minutes there is not much chance for ordinary houses, although a few firemen and auxiliaries may be present.

It is satisfactory to find that one public body is opposed to the indiscriminate adoption of the principle of giving the highest rate of wages to workmen, regardless of the conditions on which the contractor based his tender. A report had been sent in by a special committee of the Leeds County Council in favour of the introduction of clauses regulating wages, hours and sub-letting in all contracts. The Leeds Builders' Exchange Club, having considered the proposal, passed the following resolution without delay:—"That this meeting is of opinion that the clauses as drafted by the town clerk for insertion in all contracts entered into with the Corporation are most arbitrary and one-sided. They hold that it would have been better, before pandering to the labour party, if the contractors or their representative bodies had been consulted, so that both sides of the question might have been fairly considered. More especially do they object to clause 4, which provides for the investigation of a tradesman's books. This clause they consider to be inquisitorial and a flagrant violation of the right of free contract." The Leeds Master Builders' Association also protested against some of the clauses, and expressed the opinion that if the proposals of the committee were persisted in the Corporation would have to go outside of Leeds for contractors, and even then would probably have great difficulty in obtaining them. It further suggested that the Council should submit to the Association a form of contract for their consideration. In the face of such determined opposition, what could a Council do? An effort was made to uphold the policy proposed, but finally it was decided that the question should be referred back to the committee, who should be instructed to consult with the masters' organisations, as well as those of the men, before submitting the rules to the Council again. We have often recommended builders and other employers to assert their power, instead of allowing themselves to be ignored by local authorities. The protests in Leeds have at once overwhelmed the Council, and the course of action which succeeded there would not be a failure in other places.

EVERYTHING in the best of worlds might be supposed to be going wrong. On all sides persons put themselves in evidence as saviours of their fellows. This has been a remunerative occupation for many who have an ambition to make money and notoriety for themselves, but which they are too lazy, or have not the ability or perseverance to secure in a legitimate way. At present there is an opening for other heroes to rise up and save us from such friends. Outside of these matters, however, there is a good deal of injustice done to professional men; but if there is a real grievance it is worth no man's time to work for reform. One case in point is that public bodies, institutions, &c., having to rely on officials for conducting routine work, and often special work that can only be done by men trained by costly education, have now and again to fill up vacancies. The usual way when an appointment becomes vacant is to advertise for applicants. In many cases this simply results in utter disappointment to the applicants. Often these corporations in their advertisements should say that none but local men are to apply. Those responsible for filling up appointments should know whether they intend to get applications from the most eminent men in the country, only to pass them over in favour of one of their own subordinate officials. It may not be intended, but it is scarcely less than a gratuitous insult to men of eminence in their profession to act so.



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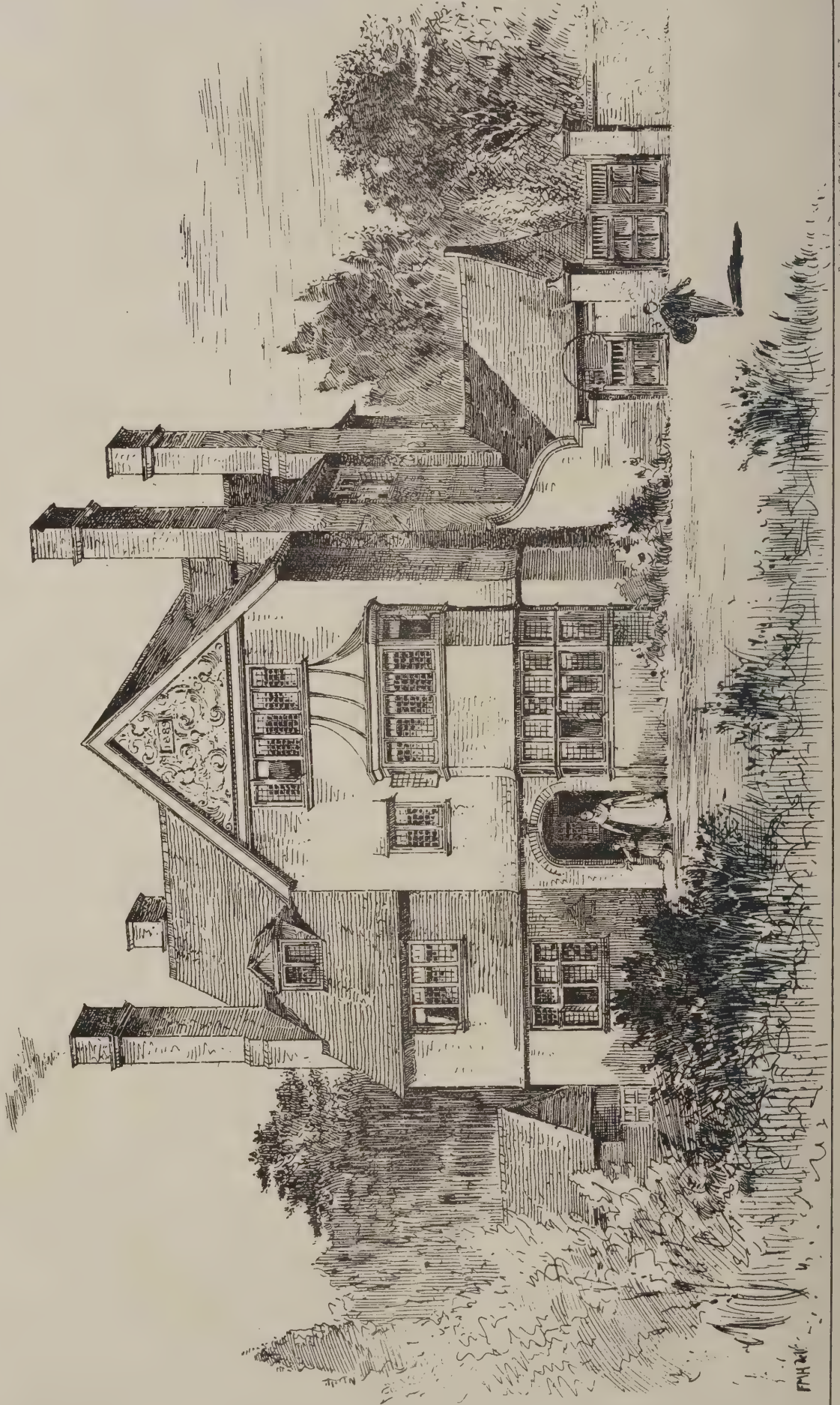
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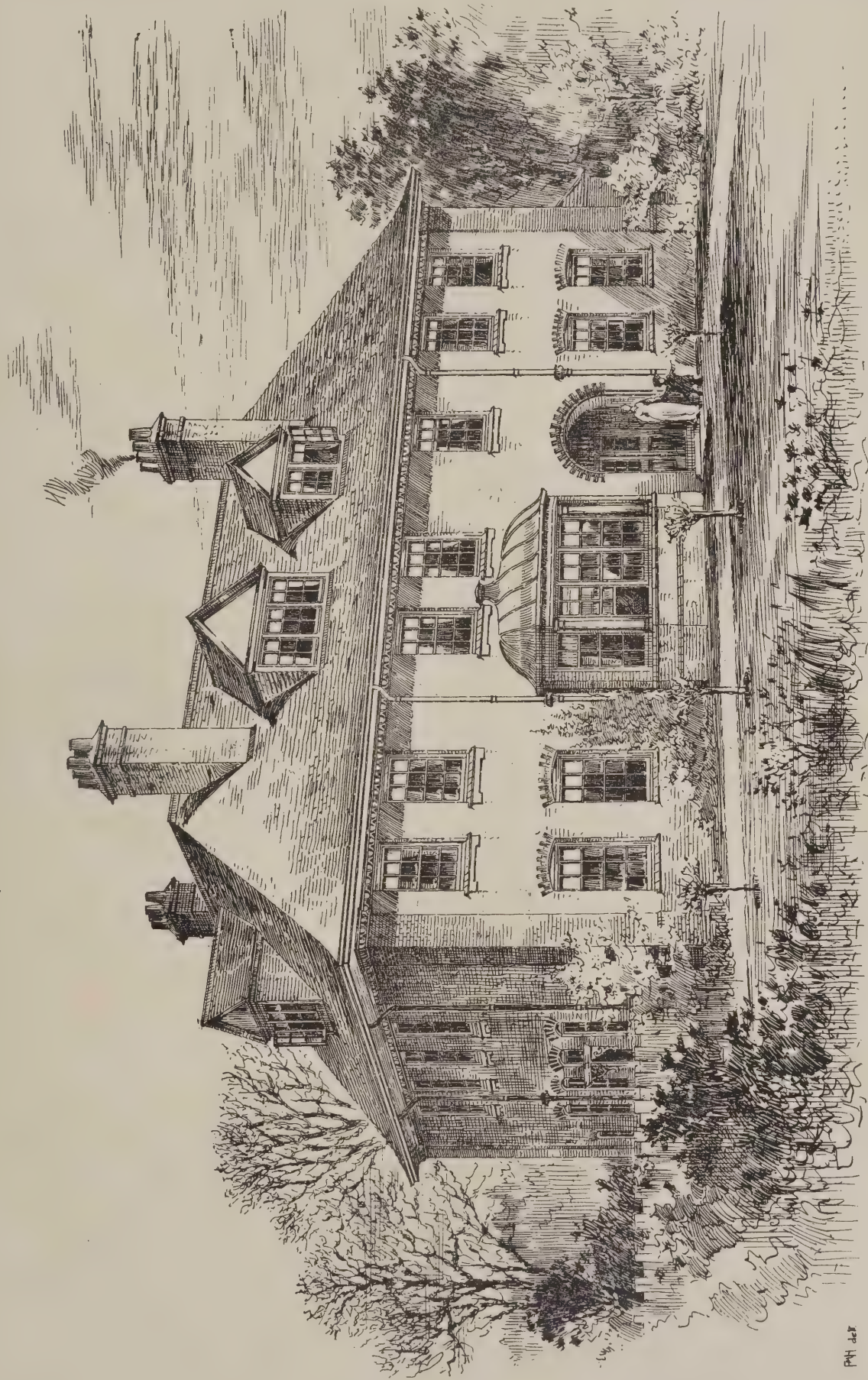
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USIC, SOUTH KENSINGTON.
IELCO, A.R.A., Architect.

LANGLEY-PUTNEY HEATH.
WALTER E. HEWITT, A.R.B.A. ARCHITECT.



THE RED BRANCH HOUSE, WIMBLEDON.
WALTER. E. HEWITT, A.R.B.A., ARCHITECT.





PHOTOGRAPHED BY BEDFORD LEMERLE & CO

1894.



AYRTON, WALDEN.
Architect.

ILLUSTRATIONS.

THE ROYAL COLLEGE OF MUSIC, SOUTH KENSINGTON.

THE new building of the Royal College of Music was opened by H.R.H. the Prince of WALES, the president, in the name of Her Majesty the QUEEN, on Wednesday, May 2. It stands almost midway between the Albert Hall on the north and the Imperial Institute on the south, on a broad road running from Princes Gate to Queen's Gate, and called the Prince Consort Road. The college is built of red brick, with bands and dressings of Weldon stone, and the roofs are covered with green slate. The style is Renaissance, freely treated. The cost of the building has been defrayed by a sum of 45,000*l.* munificently presented to the Prince of WALES for the purpose by Mr. SAMSON FOX, M.Inst.C.E., of Leeds, in 1891. The decorations of the entrance hall have been carried out at Mr. FOX's cost by a further donation of 1,000*l.*

The college has been erected from the designs of Sir A. W. BLOMFIELD, A.R.A., by Mr. THOMPSON, of Peterborough, on a plot of ground granted to the college at a nominal rent by the Royal Commissioners of 1851. It is divided into two wings, one for the male and the other for the female pupils. These have separate entrances, staircases and lifts, but are connected on each floor except the top by a corridor running from end to end of the building. The main entrance for the public is in the centre, leading into an entrance hall. Immediately in front of a visitor on entering is the general office for inquiries, &c., on the right are the offices and private rooms of the director and registrar, and on the left council and committee-rooms, waiting-rooms, library, &c.

In the sub-basement are the kitchen, the dining-rooms for professors, pupils and servants, and offices; on the basement, first, second, and third floors are the requisite number of classrooms of varying sizes, and in the upper part of the towers, which form a conspicuous feature at each end of the building, are placed the organ-rooms.

The building occupies the portion of the ground immediately abutting on the Prince Consort Road, and space is left in the rear for the erection of a theatre and concert-room, as well as for other additions as the number of pupils increases. Owing to the fact that the ground falls rapidly away from the front, the building has a basement and sub-basement below the ground floor, both entirely above ground on the south front and at the sides.

The theatre already mentioned will, it is hoped, be erected at no distant date. It will be planned to serve also for a lecture-room and for orchestral concerts, and will be placed immediately at the back of the central offices on the spot now occupied by the temporary hall, with ample means of easy and direct access and exit by the front entrances. Underneath the theatre, which will be entered on the level of the ground floor, will be large rehearsal-rooms, dressing-rooms, &c. Mr. OLROYD, of Leeds, was entrusted with the ventilation, &c. Immediately below the roof is a noble room running nearly the whole length of the building, which it is hoped to occupy shortly with a collection of musical objects.

In a room immediately behind the temporary hall is the very valuable and unique Donaldson Museum of historical musical instruments formed by Mr. GEORGE DONALDSON, and presented by him to the Prince of WALES for the permanent use of the college.

The statues of the Prince and Princess of WALES in the entrance hall, and the bust of Mr. FOX, were executed by the late Prince VICTOR OF HOHENLOHE. The statue of the Princess was presented to the college by a committee of ladies through the Marchioness of SALISBURY, president of the committee; and that of the Prince of WALES by a committee of gentlemen through the Earl of LATHOM, the chairman. The bust of Mr. FOX was executed for the council of the college. In the council-room is a marble bust of the late Duke of CLARENCE, executed for Mr. SAMSON FOX by Mr. J. S. WEBBER, the sculptor, of Harrogate, and presented by Mr. FOX to His Royal Highness the Prince of WALES as president of the college.

THE MARKET PLACE, SAFFRON WALDEN.

LANGLEY, PUTNEY HEATH.

THIS house stands in a good position upon the Kingston Road, close to Putney Heath. It is constructed of red brick facings, the upper part of the walls

and roof being tiled. The windows have wood frames and mullions and iron casements, and are glazed with lead lights. The ground floor provides three sitting-rooms, with separate garden entrance from the hall, also kitchen and offices, as there is no basement. On the first floor there are four bedrooms, dressing-room, bath-room, &c., whilst the top floor has two bedrooms, with large day and night nurseries, h.m.c., and box-room.

The architect was Mr. WALTER E. HEWITT, A.R.I.B.A., of 7 Great College Street, Westminster, and the contractors Messrs. GEORGE CANDLER & SONS, of Brixton, who executed the work with great care.

RED BRANCH HOUSE, WIMBLEDON.

THIS building is the result of an attempt to design a good, plain, sensible family residence, giving a large amount of accommodation for a small outlay.

The house, which is now approaching completion, is situated on a somewhat cramped site in Lauriston Road, Wimbledon, and the plan has been considerably affected in consequence, and a basement for coals, wine, stores, &c., made necessary. On the ground floor there are four sitting-rooms, hall with garden entrance and lavatories, kitchen and offices. The first floor has, including day and night nurseries, six bedrooms and dressing-room, with bath, also separate bathroom, linen-room, h.m.c., &c. The top floor provides four bedrooms, h.m.c., box-rooms, &c. A main staircase gives access from the ground to the first floor, while a secondary staircase reaches from the basement to the top floor.

One great object kept in view was to minimise the servants' labour, and to effect this a lift has been provided for carrying coals, boots, &c., from basement to top floor.

Hot and cold water can be drawn on each floor, and brass fittings have been carefully avoided as far as possible throughout, the door furniture being of ebony, dull polished, and the fender-curbs to the sitting-rooms of marble, with pitch-pine floors wax polished.

The elevations are of simple character, it being intended that the walls should be draped with nature's covering in the shape of creepers.

The facings are of dark brindled Horsham stocks, with red-brick pilasters, arches, cills, bays and chimney-stacks.

The roof is covered with green Tilberthwaite Westmoreland slates, and has a very wide projecting eaves cornice.

Mr. WALTER E. HEWITT, A.R.I.B.A., of 7 Great College Street, Westminster, and of Wimbledon, is the architect.

The contract sum was 2,485*l.*, and the work is being efficiently carried out by Messrs. E. P. BULLED & Co., of Croydon.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE annual general meeting of the forty-sixth session of the Liverpool Architectural Society was held on Monday, Mr. Henry Hartley presiding. The following officers were re-elected:—Mr. Henry Hartley, president; Mr. A. Culshaw and Mr. H. W. Keef, vice-presidents; Mr. J. W. Blakey, librarian; Mr. Jas. Dod, treasurer; and Mr. Henry L. Beckwith, secretary. The President, in his address, said that during the past year they had done much towards advancing the influence of their Society and establishing its position among them. It was a cause of great gratification to hear of the establishment of a chair of architecture at the University College. The last remarks he made on the subject were hopeful but uncertain, but now at the close of that session they were able to refer to it as an accomplished fact. They were now only awaiting the appointment of a professor to make it complete. The senate of the college in all probability during the next few days would appoint a professor. The medical school had worked and striven for two additional chairs, which, through the liberality of Lord Derby and Mr. George Holt, had now been provided. He alluded to this to show that the chair of architecture had not been singular in the period of its waiting. In view of what had been accomplished, he suggested that all members of the profession should endeavour to make the new chair successful by inducing pupils to attend the lectures. Mr. J. M. Hay remarked that the professor of architecture should be a man not only possessing good sound practical knowledge, but also a thorough theoretical acquaintance with architecture as a fine art.

THE PRESIDENT ON THE ACADEMY EXHIBITION.

IN his final speech at the Royal Academy banquet on Saturday Sir Frederick Leighton said:—More fortunate than last year at this season I have to note to-day the loss of one only among the acting members of this body—that of a sculptor of much repute, whose first steps in art were taken under the stimulating guidance of a powerful artist whose name is a just boast to the green island which gave him birth—John Henry Foley. Less vigorous, no doubt, than his eminent master, Charles Bell Birch yet imparted to his works great life and spirit, and the charm of a facile and picturesque execution, and even in this day of renovation and growing strength in the practice of that stately art, sculpture in this country will miss him in its ranks. From amongst the honorary retired Associates of this body another sculptor, W. F. Woodington, has been removed by death—an artist whom for many years age and infirmity had withdrawn altogether from public ken. The work of his vigorous prime may still be appreciated on the base of the Nelson column in Trafalgar Square. But whilst our active ranks have suffered diminution by one death only within the year, two justly conspicuous men have fallen in the wider field of English art, both of them men of marked and distinctive personality—both painters, both to me deeply interesting. One of them, Albert Moore, an unbending upholder of the sufficiency in art of whatever is nobly decorative, was a devoted student of the severer graces of Hellenic art, and married in his works spontaneous and supple gesture with forms of chaste sobriety, clothing them in delicately harmonious tones, of which the studied arrangement announced to the first glance the refined idiosyncrasy of his artistic temper. How great a psychological contrast is offered to the placid charm of these works by the fervour of those of the artist whom I have next to name, an artist of strong intellectual bent and steeped in human sympathies, the originator of the movement which startled humdrum people forty or more years ago, and produced a most interesting phase of English art—I speak of Ford Madox Brown, who recently passed away in the fulness of respected years and in the unabated intensity of his convictions. I am not here to defend in every point the nature of those convictions; I am not wholly at one with them. Ardently admired by many, stimulating and highly interesting to a still larger circle of the intelligent, who did not, perhaps, wholly follow his doctrine, he was not altogether acceptable to the wider and less cultured public which so largely influences the creation of that empty and fickle thing called popularity; for there was that in his work which was apt to rouse the uneasy dread of the not usual which mostly marks the middling mind. But this, apart from his technical endowments and rare vividness of dramatic vision, I fearlessly affirm—in the work of no English hand burns a more ardent sympathy with human emotion, or is revealed a more subtle observation of the outward signs and gestures by which these emotions are conveyed. The artistic memories which associate themselves in our minds with Madox Brown and his concentrated energies bring vividly before us as we look upon the walls of this exhibition, or glance in thought over the wider area of contemporary production in England, the changes which two score years have wrought in the character and tendencies of art in this country. As we wander through these, I rejoice to say, more than ever catholic and hospitable galleries, within which the still young unfold this year so much vitality and promise—and gentlemen, to us, the old, there is, believe me, no gladder sight or one more full of comfort—we are struck, not with a concentration of aim or purpose in the school, but rather with a radiation and scattering of effort in innumerable directions. No one, I think, can fail to observe the extraordinary differences of mood and manner shown in the works that have found equal shelter on these walls, and the wide multiplicity of individual personalities which they proclaim. In the range of figure-painting, for instance, what variety of subject as well as of temper meets us. We see not historic or domestic scenes alone—not alone scenes in which the rhythmic dream of beauty and of style is aimed at—but works also not a few of purely imaginative character, fanciful, mythological, allegorical, symbolic, amongst which latter one especially, I think, is dominant in its powerful originality and the weird charm of its decorative pomp. In the region of landscape, no less, every mood is touched and every association evoked, from the infinite solemnity of the silent Arctic solitudes to the infinite sweetness of a Surrey homestead nestling within its sheltered nook, or the laughter of the flower-fields of the Alps in June. What various temperament, too, we note in the expressional use of tone and colour—here, vivid and vibratory; there, grave and soberly subdued. In sculpture, again, though the display is numerically small, there are amongst various good works some that are salient. I will name one by a late *alumnus* of these schools, which has passed into the hands of the nation, and, in another room, the dazzling sketch of a monument, deeply

pathetic in its occasion, and of which this country will, I believe, be justly and lastingly proud. On all hands, then, in sum, we are conscious of Life. With it, we are aware in much of the art of the day of a certain feverish tentativeness—a grouping, as it were, sometimes after a new spirit, sometimes after a repristination of the old in a modern form; but everywhere, I repeat, we see Life. And, gentlemen, to those who, like myself, believe in the necessary triumph of the higher over the less high, in the eventual sure survival of the wholesome and the strong, and in the falling away and withering of the vicious or the morbid, this sign is the most welcome, the most inspiring and the most hopeful sign of all.

CHURCH BELLS.*

PERHAPS the earliest bells of which we have any record are the small bells which were hung from the edge of the ephod worn by the high priest, of which Moses speaks. Bells do not appear to have been introduced into Christian worship until the fifth century. Paulinus, Bishop of Nola, in Campania, is generally credited with their invention or introduction into church use. These early bells were hand-bells, and were made of iron plates beaten into four-sided shapes, and welded or pinned. These were called *No'æ*, and the larger bells *Campanæ*. Church bells are, however, also called "*Signa*" in Mediaeval documents. Bronze bells were found by Mr. Layard at Nineveh; they have also been found in Indian cromlechs and cairns, and small bells have been found in Egypt of the Ptolemaean period.

Mr. Westwood, in "*Arch Cambrensis*," speaks of the Irish in their early attempts to Christianise Iceland carrying with them Irish books and bells. The term "*tintinnabulum*" was given to a set of small bells of different tones set in a row and struck by a hammer, but we soon find the *Nola*, or hand-bell, generally called *tintinnabulum*. Some of these, of great antiquity, are now extant in Ireland, North Wales and Scotland. Bells appear to have been used in Ireland as early as the time of St. Patrick (died 493). Giraldus Cambrensis says that "both the laity and clergy in Ireland, Scotland and Wales held in such veneration certain portable bells that they were more afraid of swearing falsely by them than by the Gospels, because of some hidden and miraculous power with which they were gifted, and by the vengeance of the saint, to whom they were particularly pleasing, their despisers and transgressors were severely punished." When St. Teilo was raised to the episcopal dignity we are informed by the "*Liber Landavensis*" that "the people presented him with a bell that was more famous than great, more valuable in reality than appearance, because it condemned the perjured, it healed the sick, and, what appeared more wonderful, it sounded every hour without anyone moving it." This bell was called "*Bangu*," a name which later on was given to a hand-bell kept in all the Welsh churches, and which, among other uses, always took part in funeral rites. The clerk or sexton took it to the house of the deceased on the day of the funeral; when the procession started a Psalm was sung, then the bellman sounded the bell in a solemn manner for some time, when another Psalm was sung, and again sounded it at intervals until the funeral arrived at the church. It is the custom at Oxford for a bellman to precede the funeral procession of any member of a college, sounding the bell at intervals until the corpse arrives at the place of interment. The late Professor Westwood, in writing of a bell of bronze which has been kept in the church of Llangwynnodl, Carnarvonshire, says that the clerk before a funeral used to go round the churchyard ringing the bell. He further says that there are persons still living who remember that in Carnarvon a bell used to be rung through all the streets to give notice of an approaching funeral. At Holywell, Flintshire, a person goes round the town ringing a bell to call the inhabitants to church, from which he is called the walking steeple. The bell at Llangwynnodl has serpents' heads for the terminations of the handle where it is attached to the bell. The bell is flat-sided, and has a clapper formed of a long iron stem, with a ring of the same metal fastened near its extremity, and suspended from a hoop of metal fixed within the upper part of the bell beneath the handle.

In the Journal of the Archaeological Institute, vol. 5, p. 330, is described an ancient bronze bell which was found at Marden, Herefordshire, in cleaning out a pond. The pond is only a few yards from the church built on the spot where the body of St. Ethelbert, murdered by Offa, was said to have been deposited. The site of the vicarage has been asserted to have been that of Offa's palace. The bell appears to have been formed of a sheet of bell metal which had been hammered into shape and rivetted. The handle at the top is rounded beneath for the hand; the clapper is gone, but there is a loop inside from which it was suspended. It is 12 inches in height, without the handle, 7½ inches across the bottom in the widest and 5 inches

* A paper read by Mr. S. S. Stanley, at the annual meeting of the Warwickshire Archæologists and Naturalists' Field Club.

in the narrowest diameter; the upper part is 5 inches in the largest and 3 inches in the narrowest. The circumference at the top is 15 inches, and at the bottom 24½ inches. The rudeness of this bell, as well as the proximity of the locality to Wales, would lead to the supposition that it is a relic of the British rather than of the Anglo-Saxon Church, strengthened by the description of a similar bell preserved at Birnie, in Scotland, the Christians of which country were disciples of the early Irish Church, between which and the British, on the authority of the Venerable Bede, there were no material distinctions. Two bells of a similarly early make have been found at Llandisant and Llanrhyddlad, and were probably used in the celebration of mass. The bell of St. Kentigern, the great apostle of Strathclyde, after forming for centuries a prominent feature in the armorial bearings of the archiepiscopal see, still figures in the modern arms of the city of Glasgow. Many other Celtic and very ancient bells are figured and described by the Rev. H. T. Ellacombe in his treatise on the bells of the Church. There is a figure of a bell-ringer on a Saxon font from Hutton Cranswick, now in the York Museum, and on a column of a chancel arch at Stoke Dry, Rutland. The bell-ringer on the font is supposed to symbolise the devil driven out at baptism. Quadrangular bells of the Celtic type are to be seen sculptured on the crosses at Winwick, Lancashire, and Kilcullen, Wicklow; also on the lintel of a doorway at Glendalough, Wicklow. I have seen in the possession of Sir Henry Dryden a similar bell to these ancient Celtic bells which I have described, but its history was lost. These bells are precisely similar to the small bell now used for attaching to the neck of a sheep, the bell-wether of the flock, on the Downs. There was another sort of Irish bell of a pear shape, called "Crotal," several of which are now in the museum of the Royal Irish Academy.

I now come to speak of large bells, and I might preface my remarks by an allusion to the curfew. The sounding of an "ignitegium" was a custom which prevailed in Spain, Italy and Scotland, and most of the countries of Europe, when it was instituted by King Alfred the Great at Oxford, and later on more rigidly enforced by William the Conqueror. The law was abolished by Henry I. in 1100. Pope Sabinianus (A.D. 604), having ordered the hours to be sounded on the bells, is thought to have introduced the use of the Campanæ, or Signa, as the large bells were called, into churches.

The Westminster clock bell, the largest we have, was cast by George Mears in 1857; it weighs 13 tons 10 cwt. 3 quarters 15 lbs. It was designed by Edward Beckett Denison, Q.C. the ornamentation being designed by the late Arthur Ashpitel, F.S.A. This bell is commonly known as Big Ben of Westminster. Peter of York is the next largest. It was cast by Messrs. Mears in 1845, and weighs 12½ tons. The Mighty Tom of Oxford is the next; it weighs 7 tons 12 cwt., and was cast in 1681 by Keen, or King, a Woodstock bellfounder. The great bell of the cathedral of Lincoln was cast by Thomas Mears in 1834, and weighs 5 tons 8 cwt. The great bell of St. Paul's, inscribed "Richard Phelps made me, 1716," weighs 5 tons 4 cwt. The Great Peter, of Exeter, is reported to weigh 6 tons 5 cwt., and was re-cast in 1676 by Thomas Purdue. Great Peter of the cathedral at Gloucester is thought to have been founded early in the sixteenth century. It has the founder's escutcheon (three bells) and the arms of the church (a sword and two keys, saltire) and the inscription, "Me fecit fieri Conventus nomine Petri." Besides this bell—the clock—Gloucester has eight bells, of which five or six date from 1390-1418, and were founded by Robert Burford, of London. No. 5 is a Mary bell. Great Peter weighs upwards of 2 tons 18 cwt. The Moscow bell is said to weigh 220 tons, and one at Troitzkoi 171 tons. A bell of early in the fifteenth century forms the third bell of St. John's, Coventry. It bears the inscription, "Henricus Dodenhale me fieri fecit," and on the crown "C ST. JOHIS," which probably stands for Campana Sancti Johannis. At St. Chad's Church, Cloughton Lane, there is a bell which is thought to be of the date 1296. It bears inscribed thus, "ANNO DNI M CC NONO AI +," the letter "v" is reversed. At Cold Ashby, Northamptonshire, one is inscribed "+ MARIA VOCOR ANO DNI M CCC XVII." Two richly-ornamented bells, dated 1323, are in the tower of St. Mary, Somercotes, Lincolnshire. Bells of the fourteenth century rarely bear their date, but generally have an invocation to some saint and the founder's arms or trade mark. Sometimes bells have the alphabet, or some portion of it, instead of inscription. Such a bell may be seen at Ryton in this county. About thirty years ago, on taking down a bell for repairs to the steeple of the church of Ornolac, near Ussat-les-Baines (Ariège), it was found to bear the date 1079, and must, consequently, be one of the oldest hanging bells in Christendom.

The remarkably fine bells of Limerick were originally brought from Italy; they had been manufactured by a young native, and finished after the toil of many years, and he prided himself upon his work. They were subsequently purchased by the prior of a neighbouring convent, and, with the profits of this sale, the young Italian procured a little villa, where he

had the pleasure of hearing the sound of his bells from the convent cliff, and of growing old in the bosom of domestic happiness. This, however, was not to continue. In some of those broils, whether civil or foreign, which are the undying worm in the peace of a foreign land, the good Italian was a sufferer among many. He lost his all, and, after the passing of the storm, found himself preserved alone, his fortune, friends, family and home having perished. The convent in which the bells, the *chef-d'œuvre* of his skill, were hung was razed to the earth, and these last sold to be carried away to another land. The poor unfortunate, haunted by his memories and deserted by his hopes, became a wanderer over Europe. His hair grew grey and his heart withered before he again found a home or a friend. In this desolation of spirit he formed the resolution of seeking the place to which these treasures of his memory had been finally borne. He sailed for Ireland; proceeded up the Shannon; the vessel anchored in the pool near Limerick, and he hired a small boat for the purpose of landing. The city was now before him, and he beheld St. Mary's steeple lifting its turreted head above the smoke and mist of the old town. He sat in the stern and looked fondly towards it. It was an evening so calm and beautiful as to remind him of his own native haven in the sweetest time of the year—the death of the spring. The broad stream appeared like one smooth mirror, and the little boat glided through it with almost noiseless expedition. On a sudden, amid the stillness, the bells tolled from the cathedral; the rowers rested on their oars, and the boat went forward with the impulse it had received. The old Italian looked towards the city, crossed his arms on his breast and lay back in his seat; home, happiness, sound recollections, friends, family—all were in the sound, and went with it to his breast. When the rowers looked round they beheld him with his face turned towards the cathedral, but his eyes were closed, and when they landed they found his body cold.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

RICKMAN'S LETTERS ON THE ARCHITECTURE OF FRANCE AND ENGLAND.

THE little book called "An Attempt to Discriminate the Styles of Architecture in England from the Conquest to the Reformation," by Thomas Rickman, is always likely to be treated with reverence as one of the classics of English architectural literature. Originally it was only a magazine article, and a copy appears very slight and, to those who judge of value by bulk, unimportant if compared with one of Mr. Parker's editions. Several years after the appearance of the "Attempt" Mr. Rickman composed some letters comparing the English styles with those of France. They were afterwards added to some editions of the little book on English work. But they were omitted from Mr. Parker's edition of 1862. Subsequently the letters were used as an introduction to a later edition. Then it was decided to make them a part of a separate work, which never appeared. In the edition of 1881, which we believe is the latest, there is a note relating to them, and the reader is referred to the appendix for them, but no appendix of the kind is found in the volume. Rickman's letters may therefore be classed among the puzzles of bibliographers. They have interest on that account.

But the value of the letters and the "Attempt" should not be determined by interest of that kind, or by the amount of information contained in them. The difficulties of the writer in their composition should also be taken into account. In the early part of the century it was no easy or inexpensive task to travel through the country to compare buildings. Rickman was compelled to be satisfied with data that nowadays would be considered scanty. But like Dalton, Young, Wells, Watt and other students of science, Rickman was able to husband his resources and make a little go far. Modern students can have the command of as many representations of buildings as they desire, and photography enables them to have the advantage of the utmost accuracy of detail, but how few men have the power to classify the facts and to draw conclusions from them like Rickman? The letters we publish reveal his peculiar skill more plainly than the "Attempt." He was a stranger in France, and his acquaintance was limited to one part of it. Few as were his excursions, they afforded him sufficient evidence about the relations between English Gothic and French Gothic, and, as we shall see, his continental experience gave him a new zest for the study of the buildings which he could find in England. It is not necessary to delay the reader by further remarks.

LETTER I.

Birmingham: 10 mo. 12, 1832.

Having, in company with my friend the Reverend William Whewell, of Trinity College, Cambridge, spent a few weeks in examining the ecclesiastical edifices in Picardy and Normandy, and having conferred with Messrs. Le Prevost of Rouen, De Caumont of Caen and Lambert of Bayeux, all active and zealous members of the Society of Antiquaries of Normandy, I am desirous of laying before the Society some account of the results of this examination, if the Society think it worthy of their notice.

I propose dividing the subjects into a series of short papers, each of which may in some degree be considered complete in itself, and be of such a length only as may excite, but not fatigue, the attention.

In the present communication I intend to state the extent of country visited, the number and character of the buildings examined, and a few general remarks on the more striking differences which at once attract attention in passing through Picardy and Normandy.

In the first edition of my essay on English architecture, published in 1817, I remarked that "in every instance which had come under my notice of buildings on the Continent, a mixture, more or less exact or remote, according to circumstances, of Italian composition in some part or other is present, and that I had little doubt that a very attentive examination of the continental buildings called Gothic would enable an architect to lay down the regulations of the French, Flemish, Spanish, German and Italian styles which were in use when the English flourished in England," and it is with great pleasure I find myself enabled by this journey to go some way towards this conclusion with respect to that part of France, at least, which was included in this tour.

The line of country visited may be thus briefly intimated:—From Dover to Calais, Boulogne, Abbeville, Amiens, Beauvais, Rouen, Jumièges, Evreux, Lisieux, Caen, Bayeux, St. Lo, Coutances, Carentan, Isigny, Honfleur, Pont Audemer, Caudebec, Lillebonne, Harfleur, Havre de Grace, and thence to Southampton.

In the course of the journey notes were taken of four edifices of Roman work, or of dates before anno 1000; fourteen cathedrals or collegiate churches; forty-three larger churches in towns; fifty smaller churches in towns and villages; fourteen domestic edifices and civil edifices; six smaller edifices, shrines and details.

In this number of above one hundred churches, only nine ancient fonts were discovered, all the rest which were seen being modern, and mostly of one species of marble called, in Normandy, Flemish marble, but we had no clear account whence it came.

With respect to the general features of difference striking an English eye on visiting the ecclesiastical buildings in Picardy and Normandy, the most prominent are:—

1. The want of clearness of outline, occasioned by the great breadth of the large churches, from their mostly having two aisles on each side the nave, and the great magnitude and grouping of the flying buttresses. Of this want of outline perhaps the cathedral of Beauvais (though it has very fine portions) is the most conspicuous example, for having no nave, only choir and transepts, it looks at a distance a heavy lump, and it is only when near enough to distinguish some of its admirable details that it can be properly appreciated.

2. The great interior height of the nave, and often of the aisles, in proportion to their breadth; this feature, though not constant, is very general, and is often from one and a half to nearly double the usual English proportions of height as compared to breadth.

3. The very general termination of the east end of large churches (and also very many small ones) in a circular or polygonal apsis; this, with the chapels and aisle surrounding these apses, tends very much (aided by the lofty and extensive flying buttresses) to give that lumpishness mentioned above.

4. Another, though not perhaps so prominent a feature, is the greater height of the windows from the floor. In only one or two at most of the whole number of churches inspected, could the windows be looked into by a person outside.

All these differences from English appearances are very prominent, and strike the eye at once of the most rapid and inexperienced traveller; but the others, which we have yet to enumerate, are equally noticeable to the eye accustomed to the examination and comparison of details.

Of these minor differences may be stated:—

1. The unfinished or irregular terminations of towers; sometimes two nearly alike, but with different tops; sometimes one tower despoiled of its ancient cornice, parapet, and pinnacles, and a very ugly modern slate roof put on it. I am not sure that we saw more than one or two towers in the whole line which were perfect in these respects, and many were terminated in a way which, though not unknown in England, is very uncommon, viz. the tower on two sides has high gables, and is roofed from these with a common house ridge roof. This sort

of roof is called a pack-saddle roof. This unsightly mode seems to be often original, but perhaps as often a mutilation. The stone spires, which are numerous, are more fortunate and in general tolerably preserved.

2. The total absence, in all our route, of a cut battlement, either real, when used as a parapet, or apparent, when used ornamentally.

One small piece, apparently very recent, on a wall in the court of the Bishop's Palace at Evreux, was the only portion we saw. Plain parapets are common, and perhaps pierced parapets in good churches still more so; but there are still very many village churches with dripping eaves.

3. The very great predominance of wheel windows, most of them large and of elaborate tracery.

4. The smallness of the exterior bases and their very trifling projection is remarkable, as is also the great boldness and projection of the few which form exceptions to this rule.

All the above are differences constantly occurring and very apparent; but there are many more to be stated, when we come to compare edifices of similar dates and characters, as worked at the same time in each country.

It may be proper in these preliminary remarks to state that in order to prevent confusion I call the entrance end of a church the west, and the altar end the east; but that, in very many instances, churches in our route were found built so much across the compass, that it is sometimes difficult to make out which is east, as the number of central towers in small churches not cruciform is considerable. In the city of Caen this deviation is so great that some of the churches are in this respect directly opposed to others.

As the nature of the stone used in the districts which we have examined seems to have had considerable influence on the design of many churches, and particularly on the ornamental parts, it will be right to notice that from Abbeville to Evreux, and perhaps even further, the larger churches are composed of a white stone, which may be scratched by the nail, and works very easily, yet seems of great durability; as works of great delicacy, executed four and five hundred years ago, and even more, are now quite fresh and perfect.

This stone seems a sort of indurated chalk, and is of different hardness in different places; it is mixed in buildings with some of the oolites from Caen and other places, and is singularly adapted for the rich and elaborate tracery, niche-work, foliage and other embellishments of the later French styles.

About Caen and Bayeux that beautiful stone called Caen stone, of which so much was once brought to England, is generally used; and of it or similar stone is much of the early Norman work constructed, some of which is as perfect as when first cut.

In the village churches we find stone of various descriptions; sandstone, limestone and other stones of the locality used mixed with the Caen and other stones of that description, which are used for the mouldings and more delicate portions of the building.

At Amiens, and some other places, a very hard dark stone has been used for plinths and bases. From Bayeux to Coutances a hard stone of very slaty texture is used in small pieces, little larger than the pieces of ragstone used in Northamptonshire, at Brixworth and other places.

In several village churches and the smaller churches in towns this slaty stone and other materials are laid in the way called herringbone masonry, but this construction does not seem always to be very ancient.

Having thus described the route taken, and noticed such matters as apply pretty much to all the buildings visited, I intend in future papers to enter into particular descriptions and comparisons.—I remain, thine truly, THOMAS RICKMAN.

LETTER II.

I now resume the account of the buildings, &c., in Normandy and Picardy, and have taken the fonts I have found for the subject of the present communication.

In the whole number of churches visited (upwards of one hundred) only nine ancient fonts were seen so as to be drawn. There might be a few more in churches we could not get into, but judging from what we did find, I apprehend not many.

A large number of the fonts, whether ancient or modern, have covers, most of which are poor and plain, and in general carefully locked. As before noticed, nearly all the modern fonts are of marble, mostly of one description, called Flemish marble. They are very commonly oval, and some are divided into two basins by a division of marble.

Of the nine fonts I now exhibit sketches. They are not perhaps quite exact representations, but are, I trust, near enough to be understood. Taking them as near as may be in their apparent order of dates they are:—

1. Breteuil (between Amiens and Beauvais). This font is of a shape not uncommon in England. It has a large central bowl, with twelve small shafts and capitals with plain leaves, and the base so common in Early English work. This font is

in very good preservation, and the tool-marks visible, but it is painted.

2. Subles (between Bayeux and St. Lo). The character and shape of this font are not uncommon in England. Its form is graceful and simple, and its mouldings and the arrangements at the corners of the foot give its date.

3. Vaucelles (near Bayeux, and not far from Subles). This font very much resembles the last, but from its mouldings seems a little later.

4. St. George de Bocheville (near Rouen). This is a large and very fine Norman church, with much of later work in various parts, with which this font harmonises. Here, as in the two last noticed fonts, there is a plain bowl on an upright foot, but diversified here by having some of the parts octagonal instead of being all circular, as in the two last.

5. Jumièges (the parish church near the abbey, not far from Rouen). This font is a curious one, being very different in shape from any of the former examples, and harmonising with various fonts of the same shape in Lincolnshire and some other counties. It is also cut in the same way, with flat fillets and shallow panels, with plain slopes for mouldings, and the panelling varied in the different sides. The font at Haydor, in Lincolnshire, is much like this. I consider this font clearly of Decorated character.

6. Duclair (on the Seine, near Rouen). This church is a curious one of various dates, so that it is not very easy to make out the date of the font by analogy. The hour-glass shape of



this font has few, if any, resemblances in England. Its mouldings are not very decisive, but I think it as late if not later than the last example. It may even be later still, but I have no reason to think it modern.

7. Carentan (between Coutances and Cherbourg). I measured this font carefully, and have drawn it geometrically to a scale of 1 inch to a foot. It is composed of several pieces, and may possibly be composed of several fragments. It is circular, and looks very much as if the font had been reversed, and the bowl added at a later date. Anomalies not uncommon in England, of which a church in York has a font which is a curious instance.

8. Ifs (near Caen). The shape of this font is not very uncommon in England, and it also by its form assimilates with the hour-glass shape at Duclair, but here the mouldings are clear and have an appearance of rather late Decorated character.

9. Haute Allemagne (the next parish to Ifs, and near Caen). The form of this font is still more common in England than the last; and, but that the neck moulding has a Decorated character, it might pass for an English Perpendicular font. I think it may be a little before, or perhaps a little after, A.D. 1400.

I fear this account of French fonts will appear a very meagre one; but comprising, as it does, all the ancient ones I

found, I shall feel very much obliged if any members of the Society who possess the means of enlarging the list will favour me with a sight of their sketches, to enable me to add to the number, and thus aid me in making what I wish to do, a more minute and extensive comparison than has yet been made of English and French architecture.—I remain, thine truly,

THOMAS RICKMAN.

At Pont Audemer are two churches, St. Germain and St. Catherine. In the former is a large font, which might be, and I am inclined to think was, ancient, but it was covered with a cloth. At St. Catherine's, the greatest part of which is of very late date and very elaborate workmanship, the font is shut in a chapel, and I could only see a small part of it below a cloth, and it appeared to be of the date and character of the church, but I could not see enough of it to draw it.

(To be continued.)

THE GHIZEH MUSEUM.

IT is announced by the *Times* that the Egyptian Government intend to expend 150,000*l.* for the construction of a new museum to contain the Ghizeh collection. From the following statement by Mr. Henry Wallis it would appear that the treasures in the museum are liable to a new danger, and that a secure building cannot be provided too soon:—

Shortly after the removal of the collection of Egyptian antiquities from Boulak to Ghizeh a daring attempt was made to secure what to the projectors would have been the most valuable objects in the museum. The plan, in brief, was to seize the jewellery and ignite the palace by means of petroleum, and then in the confusion thus created the robbers calculated on escaping with their plunder. It is to a similar danger that the museum—standing alone, distant from Cairo, and in a building composed of inflammable materials and of fragile construction—has always been subject.

Within the last few weeks, however, the risk has been considerably increased. The recent excavation of the director, M. de Morgan, at the pyramid of Dashour, has resulted in the discovery of a most important find of ancient art, including a treasure of numerous objects in gold and precious stones. This is known to every one in Cairo, and will therefore have excited the cupidity of the native burglar, who is both enterprising and daring, and, moreover, almost invariably manages to evade detection.

Hence it would be the height of imprudence to allow the collection to remain under its present conditions. The jewellery at least ought to be placed in absolute safety, for although no Egyptologist would assert that it is really the most intrinsically valuable portion of the contents of the museum, yet while it remains at Ghizeh it may lead to the destruction of the whole. Without doubt the place of greatest security in Cairo is the citadel, garrisoned by British troops, and it is there that the gold objects and jewellery should be deposited, pending the erection of a substantial and fireproof building for the museum in Cairo itself.

It must also be remembered that there is a grave source of constant danger to the collection always existing in a country like Egypt, and that has been accentuated during the last couple of years, namely, the jeopardy of an outburst of religious fanaticism, fomented by political intrigue. No one familiar with the Egypt of to-day, and acquainted with its past history, can ignore this possibility. Granted that the disturbance would be promptly quelled. But what might not happen in the meanwhile to the priceless contents of the lath and plaster palace situated a few miles outside the capital? As they stand at present, the telegraphic wire may any day startle Europe with the intelligence that the earliest records of humanity have been for ever obliterated.

THE ROMAN WALL.

THE Council of the Cumberland and Westmorland Antiquarian and Archaeological Society have recommended the expenditure of 50*l.* in making sections across the Roman wall and vallum in Cumberland, in search of the "Gromatic Ditch," whose discovery on the "Limes Rhaeticus" is exciting so much interest in Germany and also at Oxford, and in hopes of throwing some light upon the relative age of wall and vallum. The Chancellor, Mr. T. H. Hodgson, and the Rev. W. S. Calverley have been appointed a committee to endeavour to get permission to dig in suitable places and to carry out the work, in which they will be assisted by Professor Pelham and Mr. Haverfield and other Oxford scholars, who accompanied General von Sarwey along the wall last summer. It was also resolved to recommend the Society, with permission of the authorities, to deposit their archaeological library at Tullie House, where it could be made generally accessible. The meetings for the year will probably be Lake Side, Windermere, perhaps in June, and probably the Isle of Man in September.

ARCHITECTURAL ASSOCIATION SOIREE.

THE annual soirée of the Architectural Association was held on Friday evening at the Holborn Town Hall, when an operatic, melodramatic, extravaganstic trifle, as it was described, being a Lyrical Lay of Ladye Lande, in two acts, and entitled "Architopia, Unlimited," written and composed by Mr. Arthur W. Earle and Mr. E. Howley Sim, was performed by the members.

The following are the *dramatis persona* :—

ARCHITOPIANS.

THE QUEEN DIANA	...	An Aunt	...	A. W. EARLE
PRINCESS LOO	...	A pretty piece of property	...	HERBERT FORD
LETTIE (also Lottie)	}	Architesses	{	G. B. CARVILL
ARABELLA (also Pepermint)				H. PASSMORE
JABEZ	...	A bold bad Bounder	...	J. DIXON-BUTLER
LOBEN	...	An itinerant Potentate	...	C. A. FORD WHITCOMBE
MARCUS MUTTON	...	Parish Councillor	...	A. LOVEJOY
TOBIAS D. TRAPPE	...	Sanitary Surveyor	...	S. W. CURTIS

A.A. MEN.

CHARLIE	...	Algernon de Mounte Forte	...	S. CONSTANDUROS
HIGHGATE	...	An Earl	...	W. W. FURLONG
POULTREE	...	A Laird	...	A. C. BULMER BOOTH

BOYS.

NAROJI	...	Coloured	...	F. COLERIDGE SIMPSON
JEHOSOPHAT	...	An Infant	...	S. BURTON LEE

HIGHLAND WARRIORS AND DANCERS—

ALEX. FRASER and J. H. KIDD.

Stage Manager	F. T. W. MILLER
Director of Music	CLEMENT LOCKNAME

SCENE.

LADYE LANDE.

ACT I.

A SOFT AND SUNNY SEASIDE SHORE.

ACT II.

BEFORE THE GATES.

The scenery was devised and executed by Mr. E. Graham Simpson, of the firm of W. D. Simpson & Sons, St. Martin's Lane, and the various original properties provided by Messrs. Colls, of Coleman Street.

The proscenium and stage erected by Messrs. E. & A. Williams, of Southwark Park Road, S.E.

The Alexandra combination piano and organ were lent by Messrs. W. J. Ennever & Son, of Berners Street.

The extravaganza proved entertaining, and whimsical allusions were made by the actors, the majority of which referred to the Association and its present or past members. The hope was expressed that one day the President of the Royal Academy might be an architect, and "if we but had our way" paintings would have to give place to designs. Also clever parodies were introduced, particularly one "E dunno where 'e are."

Among the incidents, Charlie, Highgate and the Laird

The Earl of Highgate on the loose ;

The Laird, our Scot, who has come from the far North,

introduce themselves to Queen Diana, Princess Loo, Lettie and Arabella.

By Jove ! what jolly girls.

They eventually pair off, Charlie saying :—

Ah ! Princess Loo, the sight of you my heart has made much gayer, I'll drop the name of architect if I may be your surveyor.

In another scene Queen Diana says :—

Eh, someone another competition has just won ;

Oh, never mind the name, there's only one

Who Mounts the hills and Fords the valley deep

On the path which leads unto fame's highest steep.

All performed their parts admirably, and if we were to mention any names for special praise it would be the names of Mr. Earle and Mr. Constanduros.

The humorous parody of the A.A. official device on the programme was designed by Mr. Harold Bailey, with apologies to Mr. Walter Crane and the President.

A VISIT TO OLYMPIA.

GREECE has now, writes Mr. T. A. Fox in the *Architectural Review*, several lines of narrow-gauge railroad, which, although injurious to the primeval character of the country, have, however, the advantage of bringing within easy reach many of the interesting localities hitherto inaccessible without more or less discomfort and privation, or the expensive luxury of a dragoman and his outfit. A line has just been opened from Patras to Olympia, and it was by the unromantic conveyance of a railroad carriage that we invaded the territory of Olympian Zeus. The unobtrusive terminal station has

been kept as yet a half-mile away from the sacred precinct, as if the desecrators were unwilling to profane the holy of holies.

There is no town within nearly a mile of the site, but travellers in limited numbers are entertained at the hotel, whose accommodations for guests at the time of our visit consisted of a single room, which served in turn as sitting-room, dining-room and bedroom. A more pretentious establishment has recently opened across the way, but we were told the management was unreliable. Our hotel appeared to be the department headquarters of the army, which is used in the rural districts as police. We watched with particular interest the return of a couple of soldiers, each of whom produced from under his coat a chicken which was forthwith led to the block, and later appeared on our supper-table in a savoury stew. We suspected this delicacy was not furnished at the expense of the Government or its official representatives.

On a little knoll a few minutes' walk from the station stands the museum, a low, Classic structure built through the generosity of an Athenian banker, while in the plain beyond, watered by the Alpheios, lie the ruins of the ancient Olympia. The museum contains, with few exceptions, all the discoveries of the excavations. Foremost of them all is the Hermes of Praxiteles, one of the few originals preserved to us from antiquity. This statue is of fine Parian marble, and was found on May 11, 1877, in the Hera Temple, lying before the fragments of the base on which it once stood ; and Pausanias, that most useful Greek known to most of us only as the original Baedeker, has been the means of identifying the work beyond all question. The statue is in an exceptional state of preservation, the surface of the marble having retained its original texture, and the missing parts, which have since been restored, being comparatively unimportant. The statue enjoyed in ancient times no such high reputation as the other works of Praxiteles, but for us it is quite beyond price, and has made it possible for us to understand in some measure Praxiteles and his fame. There were, in places, slight traces of gold and colour on the statue when first discovered, but they have now almost entirely disappeared.

Every traveller in Greece is interested in trying to trace some physical similarity between the peasant of to-day and his classic ancestors. Although on the islands, notably Mitylene, I was told one often sees the fine figures and regular features of Venus and Apollo, yet on the mainland such resemblances can be seldom recognised. Now and then, however, one is startled by a pose or feature which calls to mind some Classic work.

The museum also contains the Nike of Pæonios, a wonderfully bold piece of sculpture, which represents the goddess descending to earth entirely free of support. In order to give this impression the block of marble on which the statue rests is roughly formed to represent an eagle. The figure was set on a high, slender base, the form of which was also used to give the feeling of lightness ; it was triangular in shape, so generally but one side could be seen at once, giving quite a different effect from the massiveness of a rectangular block. The celebrated sculptures from the pediments of the Temple of Zeus are well arranged on either side of the main hall, the sides being made to correspond with the width of the temple. Of architectural fragments there are few of size or special importance, but there are large numbers of lions' heads, terra-cottas, acroteria, marble tiles, &c., many of which retain their original colouring.

Descending the hill on which the museum stands, a short walk brings one to the site of the sacred precinct. The place was superficially explored by the French in 1829, who found a few reliefs, now in the Louvre. It remained, however, for the Germans, under Curtius, to thoroughly uncover the site. They commenced work in 1874, and continued for six winters. The yield of sculptures fell short of expectations, but a flood of light was shed upon the topography and architecture of the site. The most interesting remains are those of the Temple of Zeus, which stood in the midst of the enclosure and held the masterpiece of Phidias, the gold and ivory statue of the god. The bases of most of the columns are in place, and an idea of the vast scale of the structure can be had from the huge blocks of the entablature, some of which lie unbroken on the ground, and the caps of the columns, a few of which are fairly well preserved and show an echinus moulding of remarkably fine profile. The temple was built of hewn blocks of a shell conglomerate coated with stucco, which still remains in many places.

Another ruin, having a special interest for the architect, is the Heraeum, probably the oldest known temple in Greece. The forty peripteral columns, of which only six are wanting, present curious variations ; the diameters vary from 3½ to 4½ feet ; some are monoliths, while others are built up of drums. The number of flutes varies also. The most reasonable explanation of the variations is that the columns were originally of wood, and were being replaced by stone as became necessary on account of decay. Pausanias says of the temple, "Its architecture is Doric, there are pillars all around it ; the pillar in a chamber at the back of the temple is of wood." This is

certainly good evidence in support of the theory that the Doric order was developed directly from wooden construction. There is also reason for believing that part of the *cella* walls was built of sun-dried brick.

The site of most of the buildings can be identified with the map; but so little of the superstructures remain that it is almost impossible, without considerable study, to form any conception of the restored structures. Some of the pure Greek work has been supplanted by the Romans or desecrated by the cheap church architecture of the early so-called Christians, who did even more than their pagan brethren to destroy the art and architecture of ancient Greece. There are, however, many interesting architectural fragments, and on the site of the Phillipeion some fine details.

PALESTINE EXPLORATION.

ON Tuesday there was a meeting of the Palestine Exploration Fund held in the Westminster Town Hall, under the presidency of the Duke of York. A paper was read by Major C. R. Conder, R.E. He said that the interest felt in Jerusalem, as the centre of the Hebrew kingdom, made it naturally the first site to which explorers turned with increasing interest, and he believed that excavations there might still bring much to light, and that they were still possible, though there were many difficulties in the way. It was an inhabited city, and it contained one of the most sacred places of the Moslems. The southern hills outside the city walls were allowed by all to have been included in the ancient city before the Captivity. The western hill, usually called Sion, was that of the upper city of David and Solomon, and the south-west angle of its fortress-wall had been discovered. It only required to be traced towards the east. The little spur above Siloam was the quarter where the priests' houses grew up south of the Temple, where the kings of Judah had a palace, and where some of them were buried in the royal garden. It was walled in by the later kings, and the wall was rebuilt by Nehemiah. There also, therefore, they had much reason to hope for important discoveries. They might light on the palace itself and might find some remains of early archives on its site. The site of Herodium, the burial-place of Herod the Great, and the rock-cut tomb supposed to be that of the Patriarchs, under the sanctuary of Hebron, were also important objects for future investigation, and there were several uninhabited places which would yield a rich harvest to the explorer. Generally speaking, he thought it was along the great trade routes of Palestine that the most important sites occurred. The towns in the mountains were for the most part small, and the civilisation of early ages was chiefly found in the plains, along the great highways from the Euphrates, and from the sea to Damascus and to Egypt. There was, he thought, some evidence that in the earliest times the great centre of native civilisation was in Lebanon and not in Southern Palestine. Many important remains had already been found in this that region, which was full of deserted mounds some 40 feet high, which concealed unknown treasures of antiquity. The sites in region which required exploration, and which others would soon explore if we did not, included especially Kadesh itself, Orpad and Karchemish. The Society should not confine itself between the limits of Beersheba and Dan, for the kingdom of Solomon reached the Euphrates; and the "Land of the Hittites" was quite as important for Bible study as Southern Palestine. Their limits should be drawn from the Egyptian boundary to the foot of the Taurus, and the most promising sites to be found in the plain of the Orontes east of Lebanon. In Lebanon itself inscriptions of Nebuchadnezzar were cut upon the rocks; and the Assyrian conquerors, returning from their expeditions to Egypt, left monuments at Beirut and at Samala describing their distant victories. The Egyptians set up statues near Orpad, and it was quite possible that in that region they might yet recover texts which would tell of the conquest of Jerusalem by the northern enemy, or early inscriptions even of the time of Solomon. To illustrate this subject he called attention to what had actually been discovered quite recently by German explorers at Samala, in the extreme north of Syria, and to the importance of their explorations as connected with the Bible history. These results were as yet very little known in England; but the statues which they had brought home were among the chief treasures of the Imperial Museum in Berlin. There was no doubt that this important field would be further worked by German scholars, and George Smith long ago called attention to its interest and value. It was to be hoped that we might yet find Englishmen co-operating with the Germans in the recovery of its treasures. Samala lay east of Issus and south-west of Merash, where several very important Hittite inscriptions had been found. But the antiquities of Samala were not Hittite, but represented the civilisation of the Syrian race, which worshipped Hadad, the god of Damascus, and which used the Phœnician alphabet almost as early as the time of the

Moabite stone. A circular enclosure, some 800 yards in diameter, with three gates, here enclosed an acropolis on a hillock in the plain. The great south gateway of the acropolis was built apparently about 730 B.C., and adorned with forty bas-reliefs cut in hard basalt, in a rude imitation of the Assyrian style. Men with captives, a bowman, a horseman, and a soldier with an axe were represented with bulls, deer and lions; also mythological figures—a lion-headed man, a winged lion ramping and a sphinx. A statue close by had a Phœnician text of thirty-four lines in relief. It represented the head and body of a gigantic bearded figure with a round cap, and the inscription was on the columnar pedestal. He had not seen any translation of this text as a whole, but it was of much value as showing the beliefs of the Syrians about 800 B.C. Touching the bearing of Palestine exploration on the study of the New Testament, they might look, the lecturer said, to valuable results in this respect, and some had indeed been already obtained. Much that was of interest regarding the early history of Christianity in the East in the second and third centuries had also been brought to light, and more remained no doubt to be found, especially at Cæsarea and at Ascalon. In conclusion, he said that much remained to be worked out, and they must be up and doing. Twenty years ago the Palestine Exploration Fund stood almost alone. Schliemann's work was only beginning to be noticed, and many important Egyptian discoveries were still in the future. But now the movement had spread in every direction. The French and the Germans were busy in Greece and in Syria; the Egyptologists had added immense stores of valuable material to our collections. The members of the Palestine Exploration Fund must not allow others to outstrip them, or neglect one of the most hopeful and important fields of research.

CHESTER CASTLE.

AFTER many months of wearisome negotiation and tantalising red tape, it has at length been definitely arranged, says the *Chester Chronicle*, that the Chester Castle Prison shall be reconveyed to the county, the amount which the County Council are called upon to pay for such reconveyance being 4,734*l*. This is good news for the county authorities, and, as it will lead to some extensive and much-needed alterations of the court arrangements, as well as to the provision of several county offices in one building, everybody who has business at assizes or quarter sessions, or who takes an interest in county government in Cheshire, will be pleased that the reconveyance has been at length effected. For years now the prison has been utilised solely for military offenders, but for a long period it was a common gaol, and it is interesting to recall now what Pennant had to say of it in 1777, as quoted in Hemingway's "History of Chester":—"The county gaol for felons and debtors is the last place to be described. I can do little more than confirm the account of it by the humane Howard. Their day confinement is in a little yard, surrounded on all sides by lofty buildings, impervious to the air except from above, and even unvisited by the purifying rays of the sun. Their nocturnal apartments are in cells 7½ feet by 3½ feet, ranged on one side of a subterranean dungeon, in each of which are often lodged three or four persons. The whole is rendered more (wholesomely) horrible by being pitched over three or four times in the year. The scanty air of this strait prison yard has to travel through three passages to arrive at them—through the window of an adjacent room, through a grate in the floor of the said room into the dungeon, and finally from the dungeon through a little grate above the door of each of their kennels. In such places as these are the innocent and the guilty permitted to be lodged till the law decides their fate. Mr. Howard compares the place to the Dark Hole of Calcutta. The view I had of it assisted to raise the idea of a much worse prison, where

No light, but rather darkness visible,
Served only to discover sights of woe."

Such was the castle of Chester as described by Mr. Pennant in the year 1777. Since that period (says Hemingway) "the upper ward has experienced little alteration, excepting repairs and the demolition of its gateway with its towers. The lower ward, however, has been entirely demolished, and a series of buildings erected under the direction and from the designs of the late Mr. Harrison, which may well be classed among the most magnificent buildings of the kind which the kingdom can boast. The expenses incurred by these erections have been defrayed by the county rates, aided by the revenues of the river Weaver and by the contributions from the national purse towards the parts used by Government as an armoury and barracks."

It is contemplated, we gather from the proceedings of the standing joint committee, after the alterations alluded to have been carried out, to sell or lease to the War Office such part of the present prison as will not be required for the purposes of the alterations, so that part of the premises will still be

used as a military prison. Mr. Stanhope Bull, the county surveyor, estimates that the whole of the contemplated improvements can be carried out for 6,330*l.*, 4,900*l.* being apportioned to the alterations in the Crown Court, and 1,430*l.* to the provision of offices for the county surveyor, county auditor, Government auditor, and so on. Before indicating the exact nature of the alterations, we may here quote again from Hemingway, who gives what will be recognised on the whole as an accurate description of the Crown Court and the entrance thereto—"the magnificent hall of justice," as he calls it. "Before the latter," he says, speaking of that court, "is a portico with twelve stupendous pillars in double rows, each of which is 22 feet in height and 3 feet 1½ inch in diameter, hewn out of a single stone from the Manley quarry. The ceiling, roof and covering are constructed of the same stone, no timber being used throughout the whole. The hall itself is of a semicircular form, 80 feet in diameter, 44 feet high, and, including the recess for the judges, 50 feet in width. Round the extreme part of the semicircle is a colonnade of twelve Ionic columns, each of a single stone, 22 feet high, supporting a semi-dome divided into large deep caissons or coffers; in the centre of each is an ornamented rose, which, opening to the roof, serves the useful purpose of ventilating the whole of the court to any degree requisite. The bench of the chief justice is in the centre of the large recess; the seats for the grand and petty juries on the right and left; the counsellors' seats are a little lower; the prisoner's box is on the same level, from whence there is a commodious passage under the hall to the gaol, by which means there is no noise or confusion in the bringing to or removing prisoners from the court; from the prisoner's box is a gradual and regular elevation by circular steps through the whole court to the base of the Ionic pillars which form the colonnade. By this plan upwards of a thousand spectators may have a perfect view of the court, prisoners and witnesses. From its simple form and chaste style of architecture, showed to the best advantage by being lighted from above, this hall has an imposing effect upon the spectator, and gives a proper dignity to the seat of justice." So much of the proposed alterations as have already been decided upon will involve the removal of "the bench of the chief justice" from its present position to the opposite side of the Crown Court. The large pillars alluded to in the foregoing extract will not be interfered with, but the removal of the judges' bench enables Mr. Bull to provide for some improved accommodation, which is sure to be appreciated. In the first place the judges' retiring-room, in place of the present shabby apartment, will be far more ample and better appointed. Then the rooms for witnesses and jurymen will be much better than the existing ones, and other provisions for the convenience of those who have business at the court will be made which have hitherto been found impracticable. If the County Council sanction the expenditure of 1,430*l.* mentioned above, there will be an office for the county surveyor, another for the county auditor, a room for the Government audit and living and sleeping apartments for the hall-keeper, who now resides away from the premises. Altogether the improvements will tend to the convenience of a large number of people, and the county will have no need to grudge the modest expenditure foreshadowed in Mr. Bull's estimate.

THE WEST RIDING COUNTY COUNCIL OFFICES.

REVISED estimates for the new county offices of the West Riding County Council, at Wakefield, have been prepared. The estimates previously approved amount to 68,824*l.*, less 400*l.* for materials on site. The new estimates are as follows:—Tender (including fees of quantity surveyor), 76,824*l.*; boiler (additional), 500*l.*; architect's fees, 3,200*l.*; clerk of works, 750*l.*; total, 81,274*l.*, or 12,850*l.* in excess of the former estimates. The general purposes committee, in their report, deal at length with the question of the erection of offices, which had been referred back to them for consideration. Alluding to the question whether the offices shall be built at Leeds or Wakefield, the committee say the increased cost of providing offices at Leeds arises mainly under the following heads:—(1) Purchase-money of site; (2) the cost of buying a site and erecting premises for the police headquarters; (3) some extra cost for building at Leeds instead of Wakefield, though this is a relatively small item. In their former report the committee mentioned two sites in Leeds as being suitable, and these, the committee believe, are still available, subject to existing tenancies, namely, a freehold site having frontages to Park Place, Queen Street, and York Place, Leeds, containing 4,630 yards or thereabouts. The other site is known as the Leeds Cloth Hall site, bounded by King Street on the west, Quebec Street on the north and a side street on the east, and containing 4,124 yards or thereabouts. It was stated that either of these sites would be sufficient for the accommodation of the County Council and its offices, but excluding any provision

for the West Riding constabulary and the Registry of Deeds. Of these sites, the second is clearly far preferable. In view, however, of the rapid growth of the county business, and having regard to the area necessarily occupied by the buildings, it is necessary to bear in mind that the Cloth Hall site is 745 square yards smaller than the Wakefield site, and that the absence of a frontage on one side further reduces its capacity for building purposes, so that little or no margin would remain for future extensions. A further consideration is the fact that in view of the decision of the County Council additional outlay has been incurred on the police headquarters at Wakefield. Further extension has taken place in the force, and, in particular, provision has been made for a small force of mounted men, for whom stabling and barracks are being provided. Consequently, the cost of removing the police headquarters to Leeds would be to that extent increased, and the objection which has been raised to locating the police in so large a town as Leeds would be to some extent emphasised. The reasons, therefore, for selecting Wakefield in preference to Leeds are stronger now than when the committee last reported on the subject. The committee next deal with the question of the excess of the amount of the tender over the estimate approved by the County Council, and say that after very full and careful consideration they have come to an almost unanimous conclusion that to carry out any considerable portion of the reductions which have been suggested would entail the virtual destruction of the architectural character, and would result in the erection of a building which could not be considered satisfactory, having regard to the purposes it is to fulfil. They consider that the only reductions which it is desirable to make are the modification of the caretaker's quarters, and the omission of the electric generating plant, amounting together to 3,560*l.* These items being deducted, Messrs. Armitage & Hodgson's tender amounts to the sum of 76,824*l.*, including a sum of 1,030*l.* for the quantity surveyor's fee and cost of lithographing the bills of quantities.

The chairman of the committee (Colonel Mackie) moved on Wednesday that the decision of the County Council to provide offices at Wakefield be adhered to, and that the tender of Messrs. Armitage & Hodgson, contractors, Camp Road, Leeds, amounting to 76,824*l.*, be accepted.

GENERAL.

The Competition for the French postage-stamps has produced about six hundred designs. On some the effigy of Joan of Arc is substituted for the usual figure of the Republic.

Conferences between the Technical Education Board and representatives of London industries will be held at the County Hall, Spring Gardens, during June and July. The first meeting will be devoted to the building and furniture trades.

The Loan Exhibition in the Corporation Art Gallery has already attracted over 130,000 visitors.

A Reredos in teak wood, designed by Mr. Pearson, R.A., has been set up in the church of St. Helen's, Bishopsgate.

M. Jan Van Beers has been awarded the principal gold medal by the jury of the Vienna exhibition for his portrait of M. Henri Rochefort.

The Emperor of Germany has subscribed 1,000 marks towards the memorial of Dr. Schliemann, which is to be erected in Lübeck.

The Annual Dinner of the Surveyors' Institution will take place at the Holborn Restaurant (Venetian Room) on Monday, 28th inst.

The New Baths in Kirkstall Road, Leeds, are to be proceeded with at once, and the contracts signed for the proposed baths in Union Street.

The Eccles Town Council have decided to build an infectious hospital to contain twenty beds, at an estimated cost of between 4,000*l.* and 5,000*l.*

The Estates Committee of the Oxford City Council have recommended the appointment of Mr. W. H. Castle, of Oxford, to the post of estates surveyor. Seventeen applications were received for the appointment.

The Site for the proposed new post-office at Bury is still unsettled. The postal authorities prefer a site in Silver Street that will cost 120*l.* per annum, while the Town Council prefer a site in Manchester Road at 40*l.* per annum. It has been decided to again approach the authorities to get their consent to adopt the latter site.

A New Massive Oak Reredos has just been placed in the chancel of Braintree parish church, Essex, as the result of a legacy from the late Miss Wakeham. The architect was Mr. Walter E. Hewitt, A.R.I.B.A., of 7 Great College Street, Westminster, and the work has been ably carried out by Mr. Parmenter, of Braintree, and forms a very pleasing addition to the old church, with which it harmonises very well.

The Architect.

THE WEEK.

THE application for advice which was submitted to the magistrate at the Lambeth Police Court on Tuesday by the clerk of the Camberwell Vestry is a comment on the incompetency of English officialdom. County Courts are public buildings, and as such they ought to be models of sanitation. It appears, however, that when one of the vestry's inspectors visited the Lambeth County Court and tested the drains, he found the place in a most abominable state. The inspector served the usual notice, but the authorities, while promising to do the work, took the objection that the court was a public building, and refused to admit the officers of the vestry or to give them any information. As the vestry clerk could find no clause in the Public Health Act exempting public buildings, he asked the magistrate for an order for the inspection of the premises. The magistrate said he did not think he could render the vestry any assistance at present. The neglect of the authorities is not confined to Lambeth. Throughout the country complaints are heard about the state of court-houses and other public buildings. In the majority of cases the evils arise from the defective planning, and it would be expensive to remedy them. Besides, alterations might lead to inquiries which officialdom could not sustain. It is therefore politic to keep the doors closed against inspectors and to assert the privilege of exemption from examination.

THE Association for Promotion of the Fine Arts in Scotland was one of the most successful of the art unions. A society that gave from 500*l.* to 250*l.* for single historical and figure pictures, and commissioned engravings like MILLER'S *Kilchurn Castle*, after TURNER, in its early days some fifty years ago, was a benefit to Scotland. That the plates issued were Scottish in subject was also an advantage, for the support was thus applied to further a definite purpose. The Association having ceased to exist, no time has been lost in arranging a successor to it. The "New Art Union for Scotland," for that is the title, is to serve a similar purpose, but the rate of subscription will be lower than in the Association. Sir GEORGE REID, the late president of the Scottish Academy, in a letter to the Secretary writes:—"A Scottish Art Union established on the lines you propose, with a moderate annual subscription, and allowing prize-winners to select the prizes themselves in any of the annual picture exhibitions, should have a fair chance of success, if carefully and economically managed. The Royal Association for the Promotion of Fine Arts in Scotland did an immense amount of good during the fifty or sixty years of its existence. Now that it has ceased to be, there is a good opportunity for starting a new association to take its place, but perhaps on somewhat different lines. At present, owing to the long-continued depression, artists as a class are suffering not a little. An association such as you propose might help to lessen the evil by encouraging the purchase of works of art in our annual exhibitions. I think it is well worth trying. I wish you all success."

THE part of the Transactions of the Edinburgh Architectural Association which was sent out this week contains reports of some interesting papers, including Mr. AITKEN'S on "Old Edinburgh" and "Modern Edinburgh," Mr. W. W. ROBERTSON'S on "Holyrood Abbey and Palace," and Mr. J. M. GRAY'S on "Metal Engraving." The first named has necessarily many references to northern architects. It appears that the laying out of the New Town was made a subject for competition. The plan by JAMES CRAIG was adopted in 1767, and he laid the foundation-stone of the first house in Rose Court, George Street. The man who had the courage to "feu" the plot was a mercer named NEALE, and he was presented with 20*l.* by the magistrates, and it was declared that the plot was to be for ever exempt from burghal taxes. CRAIG received a gold medal and a silver box with a certificate of the freedom of the city in it. More important was "a large and lucrative practice in designing the various buildings which were erected in the carrying out of his feuing plan." His success inspired him with a desire to alter the Old Town. The Calton Hill

approach is to be credited to DAVID STEVENSON, of Bell Rock fame, and he contemplated the erection of three terraces of fine houses around the hill, but his scheme was never realised. THOMAS HAMILTON and W. H. PLAYFAIR were agents in imparting the character to Edinburgh which all the world admires. HAMILTON designed the High School, the College of Physicians, the Burns Monument on Calton Hill. He was one of the founders of the Scottish Academy, but when the galleries were to be erected the commission was given to PLAYFAIR, who was a native of London. However, he had migrated to Edinburgh when he was a boy, and was taught the art by WILLIAM STARK, a man much respected by Sir WALTER SCOTT, who said that more genius died with STARK "than is left behind among the collected universality of Scottish architects." PLAYFAIR appears to have designed more buildings in Edinburgh than HAMILTON. His best work is supposed to be the Royal Institution. He was to have charge of the reproduction of the Parthenon as a national memorial of the war with France, for which Professor COCKERELL prepared the plans, but no more than a part was erected. It may not be known to many in the South that A. W. PUGIN aided in the production of the Gothic Assembly Hall. We trust Mr. AITKEN will not be contented with the instalments of the architectural history of Edinburgh he has given, for there is much else in the romantic town which is worth the attention of so earnest an investigator.

A COMMITTEE has been formed in Pérouse, with Professor BELLUCCI as president, for the purpose of erecting in the town a memorial of PIETRO VANUCCI, better known as PERUGINO, the painter. The professor has requested the Académie des Beaux-Arts to appoint a similar committee, in order to raise subscriptions in France. It would be contrary to the regulations of the Académie to undertake a financial operation of that kind, but M. DAUMET, the president, asked the members to subscribe in their individual capacity. It is becoming on the part of the people of Pérouse to be proud of the connection of the painter with their town. They cannot, however, claim him as a native. PIETRO was born in Citta della Pieve, which is twenty miles distant from Perugia, and hence he sometimes signed his name as "PIETRO DE CASTRO PLEBIS." The humble house in which he was born in 1446 was standing until 1829, when it was demolished to make room for the enlargement of an adjoining house. Opposite was the Chiesarella, which contained PERUGINO'S fresco *The Nativity*, one of his most characteristic works.

ALTHOUGH six hundred designs were sent in for the contemplated French postage stamp, the jury could not discover one which they considered to be worthy of recommendation for adoption. The result may not appear creditable to French designers, but it must be remembered that something more than a mere portrait was sought after. The figures must be symbolic of Republican France, commerce, letters, and the end of the century. It was anticipated that several single figures, which would be suited for adaptation as statues or medals, were certain to be produced. The failure in Paris will not appear discreditable to anyone who is acquainted with the history of the "Mulready envelope" and other attempts to obtain an expressive stamp in England.

ONE of the treasures of the Bodleian Library, at least for Scotsmen, is the Gospel Book of S. MARGARET, the wife of MALCOLM CANMORE. Among all the Mediæval women there was no finer representative of femininity, and the influence she exercised on the wild tribes of the North cannot be matched by any heroine in a fairy tale. Architecture owes much to her, for she realised the advantages of beautiful buildings as civilising agents. The Gospel Book is a selection of the parts employed in the liturgies, and the illumination is an excellent example of early eleventh-century work. We believe the Marquis of BUTE, who has already rendered invaluable services to archæology, is about to add another by having a facsimile of the manuscript prepared. The book itself has a history, and owes its preservation to a series of fortunate circumstances. It is only right that the world should become better acquainted with its history and style.

CANALETTO.*

AMONG all the painters not one has shown so much respect for architecture as ANTONIO CANAL. Buildings were made the subjects of pictures before and since he appeared, but, as a rule, the artists were afraid to depend for interest on the character of the details. The preference for ruins indicates that painters believed what has been called the pathetic fallacy is influential in the painting of architectural subjects as in poetry. When SCOTT, for example, advised people to visit Melrose Abbey by moonlight if they wished to see it at its best, he was merely suggesting a favourite practice with painters. CANALETTO was not a sentimentalist of that class. He believed that buildings, especially those in his native place with which he was most familiar, were beautiful objects, and could not be too faithfully depicted. He did not consider it was an advantage to conceal details by deep shadows, or to scamp the representation of them through a fear that he would be charged with monotony. He was loyal and reverential towards architecture; he was an honest man, and therefore he tried to be as faithful to the reality as his colours and pencils would allow. Mr. RUSKIN, who commonly is satisfied with concentrating his keen vision on a bit of sculptured ornament or other part of a building, and endeavours to make a world out of it, is dissatisfied with the prosaic treatment of CANALETTO's pictures; artists of our time who fondly believe that if details are shirked, breadth is sure to be gained, look down on him because he was not imaginative. The fact is overlooked that CANALETTO could have produced his views with far less labour if he adopted a different manner. He lingered over a multiplicity of details because he found as much satisfaction in representing them as another artist finds in painting leaves. He is entitled to employ his own manner of expression, and architects at least should not be found among those who undervalue his works. No less remarkable than his loyalty was his impartiality. COINDET says that he preferred the works of PALLADIO, which had for him "un attrait tout particulier." He could not suggest the characteristics of Venice unless he made one or other variety of Renaissance prominent in the majority of scenes. But whenever a Gothic building appears in a view, CANALETTO never fails to do it justice.

We believe that many of the aspersions of which he is and has been the victim arise from what may be termed the chronological prejudice. As at one time it was asked, "Can any good come out of Nazareth?" so most of the criticism against CANALETTO becomes irrefragable if it be inquired, "Could a man be an artist who lived in the dullest of all periods—that is, between 1697 and 1768, or thereabouts?" The Renaissance in Italy was then at its lowest level, and as ANTONIO CANAL's name must appear in the histories among the last generation of the decadents, it is assumed that he was a sort of notorious representative of those who had an alacrity in sinking. Probably it was with the hope of gaining some consideration for him that FRANZ KUGLER united IL CANALETTO's name with those of his contemporaries, JOSEPH VERNET and THOMAS GAINSBOROUGH, as if he deserved to be classed with the pioneers of a new age rather than to be identified with the expiring conservatism of the first half of the eighteenth century. For the sake of his reputation it would have been an advantage for CANALETTO if he had been born a century or more earlier.

In a different age he might also have found a biographer. One of the remarkable circumstances connected with CANALETTO is the darkness which surrounds him. He was apparently a prized celebrity in Venice, for he was always setting up his easel in the public places, and patrons of art would be glad to be escorted by him through the byways and waterways of the city. But of the artist's daily life little is to be discovered. M. ADRIEN MOUREAU, the latest biographer, does not therefore attempt, like some writers, to delude his readers, for he acts as if he believed an artist's life is expressed in his works, and he devotes his pages to an investigation of CANALETTO's paintings and their relation to the time when they were produced. The obscurity is the more tantalising, because CANALETTO prepared a memoir of himself and a genealogy of his family, which he believed to be patrician.

At the time of ANTONIO's birth, on October 18, 1697, his father, BERNARDO CANAL, was one of the scene-painters of Venice, and was not the most prosperous among them. The boy helped in decoration as soon as he was able, and in that way acquired the skill in the production of effects which is so decisive it is supposed by some to be a sort of trick. Young CANALETTO was not destined to remain long in theatres. He relates how, for some reason which is not told, he excommunicated the stage and turned his steps towards Rome in his twenty-second year. An artist with an architectural bent could not fail to be impressed by the remains, and CANALETTO spent his days in drawing ancient buildings, and plates from some of them were etched by an artist who was, it is supposed, an Englishman. In Rome he was excelled by PANINI, who was not satisfied with representing buildings as they existed, and accordingly he returned to Venice. With the exception of a couple of visits to London, one of which was prolonged for two years, and occasional trips to Verona or Padua, CANALETTO appears to have spent his life in his native city.

There were two painters in vogue when he returned to Venice, but in a competition CANALETTO was preferred, and ever afterwards his position was unassailed. The English consul SMITH was one of the earliest to perceive the artist's genius and to profit by it. He posed as a patron of the arts, but he was one of that class of dealers who are the most exorbitant, for he charged for the sacrifice he underwent in parting with a treasure. By the consul's diplomacy CANALETTO became a favourite in England. Probably there are more of his works in this country at the present time than in Italy. The artist was shrewd enough to perceive it was wiser for him to deal direct with Englishmen, and he was so well received in London he was not unlikely to have remained, but the climate overcame him. The reputation he possessed among artists is evident from occasional references to him. For instance, we find BARRY in one of his Academy lectures saying that the street views of London could be made interesting if there was a CANALETTO to paint them. He produced some English views which must excite regret there are not more of them, for his pencil was as trustworthy as any photographer's lens.

London, however, has been transformed, and the tests of his accuracy are not forthcoming. Venice in its most important features is still the same. There are some visitors, especially those whose residence is brief, who say that CANALETTO has not realised the spirit of the place. They should remember that the appearance of Venice often corresponds with the moods of the stranger. A man who has stored his mind with the real and imaginary events which are associated with the buildings will find that the dreariest day corresponds with something which memory can call up. If he is able to create ghosts, there is no more fitting scene for their display. The shopkeepers, hotel-keepers, the agents for letting out historical chambers as lodgings, the guides, the boatmen, the Customs' officers, and, in fact, the whole of the population who live on the spoils of strangers, look on everything ancient in a different light. When Venice was a great trading city, native and foreign merchants were likely to have taken a similar view. On bright days they saw buildings so clearly that every tile was visible, they witnessed fêtes which were not to be paralleled elsewhere, they were jostled in crowds which contained men from many regions. But Venetians and strangers could not forget that everywhere individuality asserted itself. The terrible councillors, podestas, procuratori, bravi, could not enforce building regulations like those which prevail in little towns in England. Every architect appeared to have had the privilege of doing anything which was desirable to himself or his clients. At the great festivals the people were allowed to enjoy themselves in their own way. The canal police were indifferent to the advantages of keeping gondolas in lines and other means of regulating traffic. In the public places there was no apparent control. All this liberty is suggested by CANALETTO, but people are dissatisfied with it when it appears in a picture. They prefer to see all figures inspired by one object. They can admire TURNER's "Sun of Venice," appearing as if the sails were clothed in celestial light and attracting all eyes; but the old "Bucentaur," as CANALETTO represents it, a sort of "Maria Wood" on a colossal scale, which by those who had not the privilege of admission was likely to be treated as a nuisance,

* *Les Artistes Célèbres: Antonio Canal, dit le Canaletto.* Par Adrien Moureau. Paris: Librairie de l'Art.

does not seem to be shown in its poetic aspect. St. Mark's also may be considered as not having its due because the artist introduced an open-air theatre near it, and placed booths close to the principal entrance. By this treatment the peculiarities of Venetian thought are suggested, and it becomes evident that the pomp of the doges and council had also its humorous side.

M. MOUREAU takes CANALETTO's pictures and etchings as texts, and explains how far they correspond with Venetian life as described by travellers and letter-writers. His chapters on Venetian society in the eighteenth century, and the subjects of the pictures, form a commentary on the artist's principles which is invaluable. Any one who visits Venice will find a new interest in the scenes from what is written by M. MOUREAU. He also criticises CANALETTO's manner as a painter and etcher with sound judgment. Then there is a chapter on pupils and imitators of ANTONIO CANALETTO, which forms a necessary development of the subject. The numerous illustrations are on a large scale, and they are among the most successful of modern reproductions. To architects especially the latest addition to the "Artistes Célèbres" appeals as a memorial of the great man who served their art with all his powers.

ARCHITECTURE AT THE ROYAL ACADEMY.

IN addition to the residences, schools, &c., already noticed, some more examples of secular buildings deserve to be mentioned. Mr. WATERHOUSE is represented by the Prudential Assurance Buildings, Nottingham. The site is more favourable for display than the majority of those selected by the company in provincial towns, and accordingly, while the building is in red brick and terracotta, it does not recall the head office so readily as some others. The tower is a gain to the neighbourhood. Another building on a corner site is Mr. DOLL's Premises for the Association for the Blind in Tottenham Court Road, which is rather showy, although not likely to have been expensive. The Residence at Monaco by Mr. JOHN GILES is of unquestionable modern Italian, and the rows of statues break the monotony of the long horizontal lines. The London and South-Western Bank, Holloway, by Messrs. TRUEFITT & WATSON, reveals what can be done with a limited site, without having recourse to the pretentious commonplaceness which some banking companies prefer for their branches, although they are aware it exemplifies jerry-building in its worst or most ambitious stage. The pavilions of the English Mission Hospital, Jerusalem, are arranged by Mr. BERESFORD PITE around the arc of a semicircle, and are in keeping with the place. Mr. BELCHER sends additional drawings of the Institute of Chartered Accountants, and a new water-colour of his design for completing the South Kensington Museum. The drawing of the principal entrance of the Northampton Institute, Clerkenwell, expresses the general boldness of the design, as it shows windows and tower as well as doorway. The theatre in the New Cross Road, by Mr. W. M. BRUTTON, is a departure from the stereotyped building. Red brick and terracotta are used, there are real windows, and other signs that it is a habitation and not a shell. Mr. A. KOCH's General Post Office, Zurich, is Anglo-Dutch in character, and more pleasing than other buildings exhibited formerly by him. The Pathological Buildings, Glasgow, by Messrs. BURNET, SON & CAMPBELL, are picturesquely grouped, but might be taken for an ecclesiastical college. Messrs. CHARLES SMITH & SON, in their Street Corner in Wokingham, exemplify what is being done by some architects to preserve a provincial character in the additions to towns, and which is preferable to foreign importations.

If a stranger visited the Architectural Room during any of the exhibitions he must be surprised at the number of new churches which appear. On the Continent there is no evidence of a similar increase. This year the average quantity has been exceeded. It is evident, however, that in the majority of them economy was very carefully studied, for apparently the desire of clergy and committees was to provide space for a multitude at a cheap rate, and there are some interesting experiments to attain that end. One is the church at Portsmouth for the Winchester College Mission, which is of the basilican type, and somehow has a

hospitable look. The painted decorations would enhance its interest. Another example is the Labour Church, by Mr. G. L. MORRIS, which has a wide nave, but the pair of towers are not a necessity. In Mr. ASTON WEBB's chancel of St. George's Church, Worcester, there appears to be an absence of the dim religious light of the old days, and the figure decorations would be pleasing to the eye. But one of the potters or ironworkers would be likely to interpret the massive railing on a masonry base which separates chancel from nave as provided to keep men of his class at a distance. According to KEELE, after a sound rule of faith, nothing is of so much consequence as a sober standard of feeling in religious matters, but some men seem brought by their feelings to the belief that a chancel should be fortified by iron and masonry until it becomes almost invisible. In gratifying their imagination they forget that they cause weaker brethren to imagine a connection between chancel and communion. The two drawings of St. Saviour's Church, Southwark, show respect for the style of the older parts. Mr. BODLEY contributes two designs. The church at Eccleston secures attention by its low but picturesque tower, and especially by the flying buttresses. Such are not often seen of late in the Academy. The church for the Society of St. John, at Cowley, in addition to a low crenellated tower, has a square buttress or pier at the end, on which is a relief of the Crucifixion. Mr. J. NEALE, in the new nave of St. Peter's, Bushey Heath, employs circular openings within recessed arches in the nave. A memorial pulpit in the same church is adorned by figures on a large scale and by a band of vigorous ornament. Messrs. BROOKS & SON's church of the Good Shepherd, Gospel Oak, is shown on two geometrical drawings, and like many of their later works it has no tower. The treatment is simple but massive. In the baptistery at St. Peter's, London Docks, Mr. M. B. ADAMS has introduced a gallery approached by steps, as the area to be treated is very restricted. The font obtains the importance that should belong to it, and in designing the elaborate ironwork the nature of the material has been respected. What might easily appear as an uninteresting corner has gained character and claims consideration as a complete work. In the church of St. Thomas, Wandsworth, Mr. E. GOLDIE has endeavoured to get over the objection to massive piers which worshippers in aisles usually entertain by diminishing the diameter of his piers to a minimum. As the nave is high there may be a little risk, but the effect is not satisfactory, and will help those who wish to see aisles abolished in churches where the worshippers are imagined to be on an equality. The Moorland Church, by Mr. B. F. FLETCHER, is probably only a design, but it is interesting, as it provides "Sunday school and shelter for horses and carriages of distant parishioners." Mr. GRAHAM FAIRLEY's Village Church, Broxburn, is a good type of the simple village church which need not impose heavy obligations on poor congregations in Scotland. Mr. BELCHER's new stalls and decoration of church, Pye Street, Westminster, will astonish the people of the neighbourhood by the costly carving and colour decoration. Outlay of that sort is often more attractive than eloquence, and especially in slums. The new front, St. Philip's, Clerkenwell, by Mr. H. D. WILKINSON, complies with requirements; for the space is divided between a tower and a window, although it would barely suffice for either alone. The church of St. Clement, Bradford, stands on a slope, and Mr. E. P. WARREN has therefore placed a terrace outside approached by steps, which enhances the interest of the building. In the church of St. Bartholomew, Ipswich, Mr. SPOONER proposes to use a series of pictorial panels under the springing of the roof, which will form a frieze. The depth is inadequate for effect. The Congregational Church, West Hampstead, by Messrs. SPALDING & CROSS, appears to be arranged differently from the majority of churches in order to suit the services. The design for St. Aidan's Church, Walton-le-Dale, represents a building that is a model of an English country church in its grace and quietude. Mr. W. G. ROWAN has in the Cathcart United Presbyterian Church, near Glasgow, produced one of the most interesting churches in a district where there are many rivals, but a tower and spire would appear to be a necessity.

There are several designs for stained-glass, prominent among them being one for the Fitzalan Chapel, Arundel,

by Messrs. JOHN HARDMAN & CO. Mr. A. GWATKIN has another frieze, in which plant form on an immense scale is employed. Mr. J. S. BABE'S "Pros Olympon" is a frieze in which the gods and goddesses are arranged in parallel lines at an angle, like the strokes in a copybook. It is not easy to represent human forms in flight, the most successful attempt being GEORGE CRUIKSHANKS'S version of traffic across the Straits of Dover, but the diversity he was able to employ would be considered as unbecoming in decorative work. PRELLER, in his great frieze that was derived from the "Odyssey," has, however, contrived to avoid monotony in dealing with the flights of the immortals. The design for a semicircular corridor ceiling, by Mr. G. C. HORSLEY, consists of trelliswork varied by panels with figures. Mr. H. WILSON'S study for reredos in Holy Trinity Church, Chelsea, is as gorgeous as a combination of mosaic, colour and metalwork, supplemented by stained-glass, can produce. Another large drawing is a portion of a banquet hall in Renaissance style by Mr. W. F. RANDALL. Mr. CLEMENT HEATON has skilfully combined coats-of-arms to form a part of the decoration of the Imperial Institute. Mr. W. G. B. LEWIS has a decoration for a dining-room in which light brown is the dominant colour. The cartoon for altar-piece, by Mr. G. W. RHIND, the subject being the Crucifixion, may be taken as an original version. The cross is of great height, and CHRIST is seen surrounded by angels while below are draped figures of the three Marys.

Antiquity has not many representatives this year. Mr. W. H. BREWER'S vigorous drawing of a high altar in Moosburg is the most prominent example. Mr. A. C. BLOMFIELD has a drawing of a part of the mosaic pavement in St. Mark's, Venice. Mr. WILLIAM THOMSON'S old gateway at San Remo is a successful example of the modern method of emphasising effects of light and shade, to which drawings in ink are so well adapted. One of GRINLING GIBBONS'S doorways with a quaint broken pediment is the subject of a drawing by Mr. A. H. BELCHER. Mr. PHENÉ SPIERS'S practised hand has rarely been more successful than in his views of the interior of the original mosque at Damascus, which was, we believe, erected for another creed.

The Architectural Room corresponds in character with the galleries of paintings. This is not a year for new buildings of exceptional importance, but an unusual number of architects have produced designs which are considered worthy of exhibition. It is a misfortune that few people will take the trouble to glance at the drawings on the walls, and it will still be believed that English architecture is far behind sculpture and painting.

SHEFFIELD SOCIETY OF ARCHITECTS.

AT the annual meeting of the Sheffield Society of Architects and Surveyors just held, Mr. E. M. Gibbs, the president, presided, and there was a good attendance of members.

The Hon. Secretary read his annual report, which was adopted after some discussion. Mr. Gibbs remarked in moving the adoption that there was a good field of work for the new Council to take in hand, and he thought that more might be done in the future than had been attempted in the past if the younger members especially put their hands to the work and cordially supported the new Council. The Treasurer's report was also read and adopted, and it was decided that both reports should be printed and circulated. The deaths of the late E. McDougall and B. H. Wightman, Fellows, were announced, and votes of condolence with their families were agreed to.

A ballot then took place, Messrs. C. Gibson and C. Winder, jun., acting as scrutineers, for the election of officers and Council for the ensuing year, with the following result:—Mr. C. M. Gibbs was re-elected president, Mr. C. Hadfield was elected vice-president, Mr. F. Fowler Treasurer, and Mr. C. J. Innocent hon. secretary; and the following gentlemen, in addition to the past presidents, were elected to serve on the Council:—Messrs. R. Fowler, J. Smith, H. W. Lockwood and Thos. Winder, Fellows; W. C. Fenton, Associate; and Mr. J. R. Wigfull and Mr. J. B. Mitchell-Withers were elected auditors.

The President pointed out that Sheffield had been made, by agreement with the Royal Institute of British Architects and the allied county architectural societies, the centre of a province which included Derbyshire, Northern Lincolnshire and part of South Yorkshire, and on his suggestion a draft letter to members of the Royal Institute residing in the province was read and adopted.

An interesting discussion then took place on the general working of the Society, and a number of resolutions were passed for the early consideration of the new Council.

HOLBEIN'S "TWO AMBASSADORS."

IN a letter to the *Times*, Mr. W. F. Dickes narrates the result of an inquiry into the signification of the puzzling picture in the National Gallery as follows:—

In the National Gallery catalogue it is stated that the earliest known notice of this picture occurs in J. B. P. Lebrun's "Galerie des Peintres," &c., Paris, 1792, wherein the author, who had had the picture in his possession, states that "he had sold it, and that it was then in England." During the autumn I set myself the task of discovering whence Lebrun obtained this Holbein. I took with me to Paris lists of such books as I had failed to find in our British Museum library, and to which I had found references. My search in the Bibliothèque Nationale was not very successful, possibly because there is no catalogue accessible to readers, and the officials, although very attentive, are soon tired of the endless demands of a searcher. But in the Cabinet des Estampes, where, by the courtesy of M. Georges Duplessis, the talented director, every facility was accorded to me, I found several of the catalogues I was seeking. One of these was that of M. Beaujon, banker and financier, of Rouen. Its full title is:—"Catalogue de Tableaux et Bustes de Marbre et de Bronze; Vases de Porphyre de Granit Rose et Gris, Porcelaines Anciennes et Modernes; Lustres de Cristal de Roche; Feux et Bras de Bronze doré; Pendules, Bijoux; et autres effets distingués. Après le décès de M. Beaujon, Conseiller d'Etat, Trésorier Honoraire de l'Ordre Royal et Militaire de Saint-Louis; Receveur Général de Finances de la Généralité de Rouen. Par P. Remy et C. F. Julliot, fils. La Vente se fera le Mercredi, 25 Avril, 1787."

There, entered as "Ecole des Pays-Bas, Jean Holbein," I found first the picture which had furnished me the clue; and then:—

"16 bis. Un autre tableau de 4 [?]8 pieds et demi ou environ de hauteur sur près de 8 pieds de large. Il représente Deux Ambassadeurs (MM. de Selve et d'Avaux), l'un Ambassadeur à Venise et l'autre dans les Pays du Nord, avec le costume des nations chez lesquelles ils étaient envoyés et les attributs des Arts qu'ils aimaient. On voit aussi une tête de mort en perspective, à prendre de l'angle gauche du tableau, et qui a l'agrément de ressembler en face à un grand poisson. Ce tableau est du même Holbein, mais la date de l'année n'y est pas. Il est du règne de François I. ou Henri II. Ces deux tableaux sont à considérer."

A pencil note on the margin says:—"Vendu avec le No. précédent, 6co f." (!?)

The remark about the absence of a date upon the picture is not surprising when we remember that Waagen in his supplement says:—"I can only add that the statement of its being dated is erroneous. Mr. Danby Seymour and myself examined it most closely." The cleaning has made this date visible, though even now it has to be sought.

Of course the idea that it represents MM. de Selve and D'Avaux is absolutely exploded. For one thing they were not contemporaries. De Selve terminated his career as ambassador in 1556, and D'Avaux was born in 1595. The probable explanation is that D'Avaux was the owner of the picture. We know that he was a collector, and as ambassador in Germany and the Netherlands would have great opportunities. In a letter dated Münster, August 29, 1646, he reports having dealt for an Albert Dürer. At that time (just before the treaties of Münster and Osnaburgh) his relations with the Palatinate were intimate. We find Baldé, the Jesuit chaplain (1647), living in the palace of the Count Palatine at Neuburg, inditing verse to D'Avaux—writing his "Memmiana," a poetic history of the D'Avaux family, the De Mesmes, and addressing him as a lover and fosterer of the fine arts, "Liebhaber und Förderer der schönen Künste."

One thing in this French description of the picture is particularly noteworthy, namely, that Frenchmen recognise that the costumes are not French, and do not even claim Holbein's fancy medal with the image of St. Michael as their Order of St. Michael. They account for the alien dress by supposing these gentlemen to be masquerading in the dress of the countries to which they were sent. Of course, to me, who recognise the two dresses as just those usually worn by the Count Palatine Otto Henry and by his brother Philipp, who always affected the schoolman's robe at home (he had formerly been rector of Freiburg University), it is difficult to understand how any artist can fail to distinguish between the prim French and the heavier and more careless English and German costumes of this period. And it is more wonderful still that there are any who will not see that the faces are those of brothers and of Bavarians. I have much fresh and weighty evidence which I reserve.

LLANDAFF CATHEDRAL.

THE Chancellor of the diocese of Llandaff has hunted out some information about the difficulties of preserving the cathedral in the eighteenth century. He says :—

The whole history of the poverty-stricken chapter from 1709-51 was, as the records show, a continuous struggle to prevent the cathedral from falling into utter ruin. Besides the many small sums voted in its corporate capacity we find, in 1729, 50*l.* given by the archdeacon personally. In 1721 the Archbishop of Canterbury (Wake) presented a petition to the Crown on behalf of the dean and chapter, and writes on November 2 to Brown Willis that "they will receive the royal bounty of 1,000*l.* I am now endeavouring to put them in the way of begging 500*l.* of the Prince of Wales, and then I think I have done; the rest must be raised among themselves and their friends." Apparently there is no record of the actual receipt of these sums.

In 1732 a royal brief was obtained for a general collection. In virtue of this 1,473*l.* 9*s.* 3*d.* was collected. In addition 931*l.* 10*s.* 7*d.* was subscribed privately by friends, 500*l.* of it by individual members of the chapter. Amongst the subscribers were the chapters of St. David's, Exeter, and St. Paul's. The latter provided 50*l.*, very probably in grateful remembrance of the fact that Llandaff in her poverty had, in 1634, voted 20 marks for reparation of "the cathedral church of Powles," and also 15*l.* in 1673. A list of the subscribers is extant, written by the Rev. James Birt, a prebendary of Llandaff and, later on, manager of the fabric fund.

In 1734 an agreement was entered into with Mr. Wood (architect of the Bath Pump-room, in the style of which he constructed a species of Italian temple in the beautiful but half-ruined nave) to repair the church for a sum of 1,700*l.*

These works were not concluded until 1752, the sums collected being insufficient to meet the expenses. But from 1751 to 1786 there do not seem to be any records of sums collected, and little was done between those dates but ordinary repair.

Though the results may have been somewhat mistaken, the facts show, nevertheless, that the authorities did their best (at a period when, be it remembered, it is said that lethargy had not only fallen upon the Church, but that even the great Welsh national institution itself, the Eisteddfod, nodded and slept), though perhaps their zeal took a somewhat mistaken direction. This, however, would only tend to prove the great work that has been done in the present century at Llandaff Cathedral.

ARCHITECTS AND THE PUBLIC IN AUSTRALIA.*

I WANT briefly to point out some ways in which we can increase our influence upon the public taste, or rather want of taste, in the art and architecture of the country, and I hope I may be able to do so in a practical manner by taking examples that are of everyday occurrence, and if there is nothing new in what I have to say, I claim that it is just as well sometimes to repeat what has already been said or remind ourselves of what we already know, though we may not have actually formed any definite ideas on the subjects or put our almost unconscious thoughts into writing. It has happened to me, as it must to any practising architect, that one is sometimes suddenly pulled up, as it were, in one's architectural train of thought or speech by some simple common-sense criticism or remark by some one outside our profession which may be quite at variance with our ideas, and which shows us that we are not sufficiently in touch with each other, and I have felt on those occasions that we architects live our professional lives too much to ourselves, and that it would be much more to the advantage of our art, not to speak of our own benefit, if we could get away more from our architectural selves and look upon our work, if possible, from the eyes of the public, with the object of making our art more popular. Why should our art not be as interesting and popular a subject to talk about as the sister arts of painting and music? Both of these form almost as ordinary a topic of conversation as Mr. Wragge's remarks about the weather. One certainly does hear new buildings criticised sometimes, but not with the same interest or intelligence shown with regard to a new picture or opera. Now are not we ourselves to blame for all this? When one considers the position of our profession at home in relation to matters of art, and the improvement of the last quarter of the nineteenth century in matters of taste, brought about in the first place by the efforts of such men as Stevenson, Norman Shaw, Burges, Edis and others, and followed on by those who have been trained up under them, and then compare our corresponding position in Australia, one cannot but conclude that we are chiefly at fault. It is the exception here to trust to an architect on a matter of artistic taste, with the feeling to our clients that though it may not be in

accordance with their own ideas they may rest assured that the architect is right. Ladies, who pay more attention than men to the æsthetic side of the question, often ridicule the idea of consulting an architect on a matter of colour, or if they should happen to ask for and obtain good advice, generally, after all, go their own way (often with deplorable and ruinous results), because they have not had confidence in their architect's judgment, though they may sometimes acknowledge after that he was right.

Now if we architects as a body took up the position we should in these matters, more attention would be paid to our advice, and we should be acknowledged the proper authorities, though of course there always will be individual members of our profession fulfilling their own particular sphere ably enough, who have no natural leaning to the purely æsthetic side of the profession, and are content to leave these matters to others. However, most of us, from the very fact that our natural inclinations induced us to take up the practice of architecture, combined with our professional training and associations, should be fitted to become leaders of taste, and those among us who are capable through æsthetic education might, I think, without unduly forcing their ideas down other people's throats, be more assertive when opportunity offers, whilst those who do not feel sure of their ground should qualify themselves by observation and education to give opinions on these delicate matters. Perhaps more harm is done to our professional reputation by repeated errors of judgment from want of knowledge than from lack of any advice at all. One serious hindrance, it appears to me, to our becoming leaders in architectural art is that there is too much pandering to the public taste in the matter of competitions as followed here, for however desirable as a means of educating our juniors in draughtsmanship and ourselves in problems to exercise our brains, not to mention practice in what is known as good business qualifications (but which too often takes the form of unprincipled smartness), they are not, I think, favourable to the erection of well-designed buildings. When, on my first arrival in these colonies eight years ago, I was assisting in the preparation of competitive designs, it was constantly urged upon me to put plenty of "fat" (which I may tell in Australian architectural phraseology means coarse ornamental splutterings) into the elevations, never to mind the cost, and to make them look attractive and busy. And so competitive designs are prepared to please and "take" the fancy of a board of men who, because they have the command of money, are constituted judges of design without their being able even to interpret drawings or realise the effect of buildings when executed from drawings. Such a broad and simple design as that of the Equitable Life would not have had a chance in a competition. There are but few instances in the city where buildings, erected from designs submitted in competition, have been anything approaching a success from an æsthetic point of view, most of our recent business premises that have any claim to good design and taste being the result of commissions given direct to individual architects, and in these instances the public taste has been educated, for I have frequently heard them favourably criticised, showing that, given knowledge of one's subject when one has the opportunity to follow one's dictates, the result is æsthetically the more satisfactory. The public can be taught to appreciate what is really good in our work just as easily as they can be led wrongly by flattery.

The whole basis of good taste in architecture is, in fact, that everything should have a reason for its existence. Look along our streets, and what do you see? Pediments stuck on, not for the purpose of protecting a door or window opening or some feature, but as a bit of ornament in itself; arches put in where they are not required, merely for the purpose of attracting attention; sham dormer gables on the tops of buildings without even a roof behind them or window in their openings; ornamentation stuck on for the sake of itself and not to adorn some feature, and overloading of string-courses, pilasters, caps and bases, columns strong enough to carry six storeys doing nothing. All these errors and many others which must occur to you are in bad taste, because there is no reason for them, and they are just as vulgar in themselves from an artistic aspect as the appearance of a woman in a ball-room decked up with trashy jewellery and millinery put on indiscriminately to attract attention is repulsive to a lady of refinement. We should lose no opportunity to tell the public why these things are bad, to explain why a beautifully-marked piece of marble should not be disfigured by over-much carving or moulding, no matter how beautifully it be executed; why each material should be employed for its specific use, and not made to represent something else. In my paper on "Domestic Architecture," read in the 1892 session, I referred to the advance we had made in recent years in the matter of the designs of our dwellings. But I already see a tendency to run riot in what is termed by the uninitiated "the new style." If we are to guide the public we must not go in for extravagances for the sake of something new. That is not good taste, and we only lay ourselves open to such condemnatory remarks as Mr. Oakeshott and I heard

* From the address delivered by Mr. Howard Joseland, president, at the meeting of the Sydney Architectural Association, published in the *Australasian Builder*.

during the Easter holidays, made with undoubted common sense. With regard to some new houses in a new suburban district it was said:—"What queer houses were being put up, such beastly things all mixed up with tiles and iron, and shingles and bricks, and wood and cement—there was no sense in it;" and in this instance there was a good deal of truth in the remark.

In our home we have great scope for using our influence towards the improvement of taste. Women, whose opinion upon the æsthetic part of building is now generally considered to some extent authoritative as a rule in these colonies, have had no opportunity of studying the use of the decorative arts, by which I mean the conventional application of form and colour as taught at the South Kensington schools, and they consequently cannot see the errors of taste exemplified by such misapplications of art as putting a painting of natural flowers or landscape on tiles in the centre of a hearth only to be smothered up with ashes and fire-irons, or executing a painting on an unsuitable background or material such as a mirror or pearl-shell, or pleating up some piece of drapery covered with some beautiful pattern in such a manner as to entirely destroy the rhythm and harmony of the design. I hope the days of committing such barbarisms as hanging-up on our drawing-room walls such absolute rubbish as rolling-pins and gridirons decked up with ribbons are past, but unless a truer artistic spirit is cultivated there is no knowing how soon they may be revived, perhaps, and just as sanely, with the additions of lumps of gilded pastry and bronzed chop bones as well. It is much to be regretted that the study of decorative art is only in its infancy in our technical schools; for whilst not going so far as our first president, Mr. Seager, as to hold that the architectural profession is suitable to women, there is no reason that I can see why they, as well as men, should not find interest and profitable employment in the æsthetic branches of our profession, or at least study them as a pleasure if not as an accomplishment. Till we have manufactories of such decorative materials as floor and wall-coverings and weavings from the looms, we cannot, perhaps, expect to have a national school of decorative design, therefore it is all the more incumbent upon those who have had the opportunity of gaining knowledge on this subject to make the best use of it for the public good.

TESSERÆ.

Roman Architecture.

THE really good things in Roman architecture of which anything remains to us are comparatively very few. The Temple of Vesta is rather Greek than Roman. Then we have the three columns of Jupiter Stator, three of Jupiter Tonans, the Temple of Antoninus and Faustina, that of Mars Ultor, and the portico of the Pantheon, all six of the Corinthian order; nor have we anything of much value of any other. There are magnificent fragments besides, and in particular some of the marble ornaments in the Forum of Trajan raise a high idea of its beauty and perfection. But there is no other building which can be considered as a model. The erections of the four first emperors were generally in good style, and a sentiment of correct taste and feeling existed till the time of Trajan. Under that emperor the productions of Apollodorus are decidedly superior to most of the edifices which preceded his time, but the artist and the purity of the art were destroyed by Hadrian. Some traces of beauty remain under Severus, but these are gradually lost between him and Constantine. A common country mason in England would make as good designs, would draw the architecture with as much truth and correctness and execute the ornaments, sculpture included, as well as the artists employed by Constantine. The degree of degradation to which the fine arts had fallen in that period is a very remarkable phenomenon in the history of the human mind, for the empire, though torn and suffering in many parts, was still great and powerful, and both for individuals and for the public the arts must still have been exercised. Yet the architects of Constantine's reign could not find workmen who could give the mouldings a regular curve, or even preserve them in a straight line or form an even surface.

The Temple of Vesta at Tivoli.

The cell is formed of *opus incertum*, which has been described by Vitruvius as a masonry of small pieces of irregular shape, fitted together and united by mortar. Some writers have supposed that by this term he meant the Cyclopean walls, which are constructed of large pieces without mortar, but his description is sufficiently precise to leave no doubt of his meaning. Of this *opus incertum* we have reason to think that it was in use in the time of Sylla and probably much before, and the complaint of Vitruvius that it was in his time giving way to the *opus reticulatum*, which though neater was less strong, together with the want of existing remains which are known to be of later date, will justify us in concluding that it

was discontinued in the reign of Augustus. Now the construction of the walls and the forms of the capital very much resemble some fragments remaining at Palestrina, belonging to the Temple of Fortune, which we know to have been restored and greatly enlarged by Sylla, and at Pompeii there are capitals of a similar taste, but evidently much prior to the earthquake which preceded its final calamity, and putting all these circumstances together, we may with some probability assign this building to the time of Sylla. These capitals are not ornamented with the leaves either of the acanthus or the olive, but with some which rather resemble those of the *Verbasicum sinuatum*, and neither they nor any part of the building offer the least trace of Greek taste as distinguished from that of Rome. We do not find at Rome any examples of similar capitals, except an unappropriated fragment or two of peperino, which may have belonged to the same period. Within the cell is a recess, which seems to have been the work of later ages. It has a large doorway and a window, both of which are considerably smaller upwards. The material of the *opus incertum* is a sort of tufa, but the dressings which surround the door and window, together with the external order, and the continued pedestal on which it stands, are of a coarse, calcareous, fresh-water deposit, much resembling travertine. This, in the columns at least, and perhaps everywhere else, was covered with a very thin coat of fine, hard stucco, and the *opus reticulatum* was probably covered with stucco also, but it must have had more substance, or it would not have concealed the little inequalities of the work below. The cornice has no modillions, and the dentil band is uncut; otherwise it would have been a regular Ionic entablature, as directed by Vitruvius. The columns have settled a little outwards, as is evident from the openings in the entablature. Here are sufficient vestiges of steps to prove that they descended laterally, and were not brought straight out, as they are usually published, but there is not enough remaining to make out distinctly all the particulars.

Stone-Carving in Paris.

The London carver of stone rarely works from a model, more often from a sketch, and not infrequently without either; the Parisian always has a model. The Londoner, with plumb-bob, rule and compasses, generally makes an approximate copy of his model when he has one; the Parisian, by means of a mechanical contrivance called a pointing-machine, makes an exact copy. The Parisian system no doubt has its advantages, but from the English workman's and from an artistic point of view, the Londoner's method is far the best, throwing the workman on his own resources and developing whatever individuality and artistic feeling he may possess. It has also the not unimportant merit of being the quicker method. The material used in Paris is a cream-coloured soft stone, somewhat resembling Bath stone, but apparently freer in working. In London, as is well known, every variety of stone is used, from the soft Corsham to the hardest of Portland among the lime-stones, and from the softest of red grits to the hard yellow gritstones of the North of England. This has developed a more useful pattern of tools than those in use in Paris. The hard stone and marble tools are similar in both countries, but the French soft-stone tools would be thought useless in England. The block of stone is chopped with axes as near to the size required as can safely be done, and the carving is then produced with wooden-handled tools and iron hammers, the English pattern of wooden mallet and mallet-headed tools being unknown. It is then scraped over with tools known in England as scrapers, and finally finished with a variety of rasps called "riffers," or "riffleur râpes." These riffers are, though seldom required, unobtainable in England of native make comparable with the French, being generally so badly shaped as to be almost useless, and this applies not only to the riffer rasps as made for soft stone, but to the riffer files as made for marble, a foreign variety known as Roman rasps being far superior.

Manchester Cathedral before Restoration.

The exterior of the church, from the decay of stone where it had not been laid upon its proper bed, had been extensively repaired from time to time during the close of the seventeenth and throughout the eighteenth centuries, and not in the best style of Gothic architecture. But the greatest havoc was wrought in the interior early in the present century under a pretext of improvement, when the beautiful columns and arches of the nave, the superincumbent clerestory, the great choir arch, the piers and arches of the outer north aisle or Trinity chapel, and the tower arch and wall above it were hacked over with a pointed pick, and then coated with cement three-quarters of an inch in thickness. As an inevitable consequence the mouldings and architecture were ruined and thrown out of all proportion, and the stability of the structure itself seriously imperilled, for on removing the cement it was found that some of the springing stones of the nave arches had been reduced to an area of only 14 square inches on their bed, on which the vast superincumbent load was borne. Happily,

in two columns and arches sufficient portions of mouldings remained to enable a complete section to be made, from which the whole of the arcades have been carefully restored. Nor did the masonry only suffer, for the ancient roof of the inner aisles of the nave, elaborately moulded and having richly-carved bosses at the intersections of their timbers, were hacked in a like manner, and after having had multitudes of nails driven into the moulded beams, were coated over with plaster and the oak bosses replaced by cement substitutes. The chief object of these alleged improvements was the erection of galleries, during the construction of which the transverse arches and elaborate screenwork defining the several chantries, and also the inner walls of the south porch, with its parvise and groined vaulting, were swept away, and the whole thrown into an unbroken area surrounded by huge galleries on every side of the square. The rich screenwork, with the magnificent rood-screen (except a small portion now fixed under an archway leading to the Ely chapel), had completely disappeared. In place of the divisional walls and arches of the southern chantries, and in order to support the roof, a range of columns and arches was constructed in hewn stone, afterwards coated with cement to correspond with the rest of the interior.

Construction and Decoration.

The notion has arisen, that if the architect takes good care of the useful the beautiful will take care of itself. New constructional necessities and discoveries have been asserted, by architectural critics of respectable standing, to have constituted, not only the germ, but the whole essence and form of each new phase of architectural character; and authorities afford examples of many confused and self-contradictory statements, in which the nature of decoration, and all that relates to effect, are treated as wholly subordinate to, and exponential of, constructive obligations. This misconception has been the reaction of the opposite and far more pernicious error of regarding all decoration as arbitrary, unmeaning and independent of construction. The error prevailed for centuries, and originated and completed the decay of every great style of architecture; it hid the discharging arch above the Roman doorway, with the falsehood of the sculptured architrave; it began the destruction of the Pointed style by the introduction of intersecting tracery lines; it brought about, by an easy gradation from forms either insignificant or unnatural, the ruinous contradiction of imitated materials, giving to Raphael's Pandolfini Palace its cornice of perishable wood; it blinded the architects of the Cinque-cento manner in England and France to the absurdity of facing Gothic masses with spectral reminiscences of Greek details. It is demonstrably wrong to regard the leading transitions of architectural style as having consisted wholly, or even mainly, in the fulfilment of new constructional necessities, and the effects to the eye as having been no more than the simple, unforeseen and unintended sequences. Constructional change, as an unavoidable condition to great novelties of effect, must have preceded such novelties in order of time. But who will venture on the absurdity of maintaining, for example, that the prodigious height of the naves of Beauvais and Cologne, and still more that of the spires of Salisbury and Strasburg, sprang from any necessities in the new construction, instead of the success and establishment of the new construction being chiefly owing to its capacity for producing this and other visual effects, which remained impossible till the round arch shot up into the lancet, and the ponderous masses of Roman and Lombard wall dissolved into the fairy framework of windows and buttresses? The very birth of the Pointed style seems to have been owing to the purely artistic element of architecture, to the desire for loftiness and magnificence for their own sakes, and not to any incapacity of the preceding style for the fulfilment of all ordinary purposes of church building. It may, however, be admitted as an important principle, perhaps the most important principle of architecture, that the peculiar artistic expression in every great and pure style, as the Egyptian, Greek, Lombard, Moresque and Northern Pointed—and, in an inferior degree, the mixed expression of less perfect styles, as the Roman, early Byzantine, Venetian-Gothic, and Cinque-cento—is always in a peculiar and harmonious relation with the manner of construction adopted. It is in every case an expression which could not be obtained legitimately under any other condition of construction.

The Cathedral of Rimini.

The cathedral of Rimini was restored and altered by Leon Battista Alberti. The works of this artist are few, and lie rather out of the beaten track, and they are particularly interesting, not merely as he was practically one of the earliest restorers of Roman architecture, but as he was the first who reduced it into a system by his writing. The old building was of pointed architecture, but it is so completely covered by more recent work that we cannot attempt to form any judgment concerning the time of its erection from the appearance of what remains in sight. The front and the one flank which is exposed to public view are entirely by Alberti, and an inscription on the frieze gives us the date of 1450. The front consists of four

columns, whose order is a compound of Doric and Ionic, neither of them well understood; and three arches, of which the middle is the largest and contains the doorway, while the side ones are merely shallow recesses. These columns are set upon a continued basement, which is unfortunately cut through by the doorway; but in other respects the proportions are good, and suited to the style adopted. The columns appear too far apart, if they were introduced as essential parts of the building; but Alberti has used them as Palladio has so frequently done, as ornaments, which may indeed contribute to the firmness of the edifice, but are not absolutely necessary to its support, and the entablature, consistently with this view of their office, breaks round them. The upper part is not completed, but we learn from a medal that there were to be pilasters over the two middle columns below, supporting an ornamental arch, with a portion of a circular pediment on each side. It is probably better that it has not been executed; but here also we find something of the disposition afterwards followed more successfully by Palladio. The flank is much better than the front, from the beautiful simplicity of its seven equal arches, rising on insulated piers; each pier has a panel, which, though they are quite shallow, is a great defect. Above each pier there is a circle of porphyry, surrounded by a wreath, and at a moderate distance over these the entablature corresponding with that of the front. In each arch there is a stone sarcophagus, and the whole is elevated on a continued basement. The only fault in the composition is the panelling of the piers. Everything else is beautiful. On the inside the arches of the nave are pointed, almost the only circumstance retained of their original form. The piers are now ornamented with architraves and Corinthian pilasters, the former of which are cut up by a multitude of small mouldings, but each still retains the character of an architrave. The pilasters are divided in their heights, like towers of several storeys, composed of a succession of distinct architectural compositions. We wonder to see the effects of so pure a taste without, combined with such puerilities within. The materials of this church are said to have been drawn from various Roman antiquities, and particularly from the church of St. Apollinaris at Classe, but there is no appearance of any ancient fragments.

Italian Monuments.

Italian monumental architecture, with some favourable exceptions, is composed of little parts, and highly ornamented. It is more broken than that of their larger edifices, often handsome, and with great beauty and delicacy in the details, but without anything magnificent or impressive; hardly ever with any character as monuments, except that as the eye becomes accustomed to see them in this form, we obtain an habitual association, and sentiments of death and eternity may be awakened in the mind; but without such habits the style would rather seem accordant with scenes of temporary gaiety. Yet in all countries, and in all ages, it has been customary to decorate tombs highly and even splendidly.

The Opisthodomus of the Parthenon.

The opisthodomus, so long supposed to be a vestibule preceding the temple, was in the back part of the Parthenon. Its width is the same as that of the temple, and its length 21 feet 6 inches, or nearly one-third of the cella. By some inexplicable error, Stuart, Chandler and others have represented, both in their text and plans, that the opisthodomus was supported by six columns, placed in two rows. There never were but four. Brönsted has so given them in his plan, and the fact has been more recently proved by Leake and Travers. One of the columns having been broken, the Turks erected in its place a square pillar of masonry, which, as well as the three columns, is now demolished. The latter, according to Stuart, were of the same dimensions as those of the smaller order in the peristyle. In the opisthodomus besides the money proceeding from the public revenues, and the contributions of the Grecian cities, 1,000 talents were always kept in reserve to meet unforeseen expenses of the State. At the beginning of the first Peloponnesian war (432 B.C.) when the power of Athens was at its height, 6,000 talents (1,296,000*l.*), according to the Abbé Barthelemy, and 9,700 talents (above 2,120,000*l.*), according to Raoul Rochette, were deposited in the opisthodomus. The names of all the debtors of the State were inscribed there. Private individuals were accustomed to deposit sums of money there which they were afraid to keep at home; it was also the repository for offerings made for the goddess, and valuable spoils taken from the Persians, part of which was the throne with silver feet, on which Xerxes sat to witness the battle of Salamis. Other trophies, shields taken from the enemy during the Median war, were suspended on the architrave outside the temple, and alternated with bronze inscriptions, if we may judge by the marks of the nails which held them. The two guardians of the treasure deposited in the opisthodomus of the Parthenon were Jupiter and Plutus, the god of riches, represented with wings, and, by an exception peculiar to this god, not deprived of sight.

NOTES AND COMMENTS.

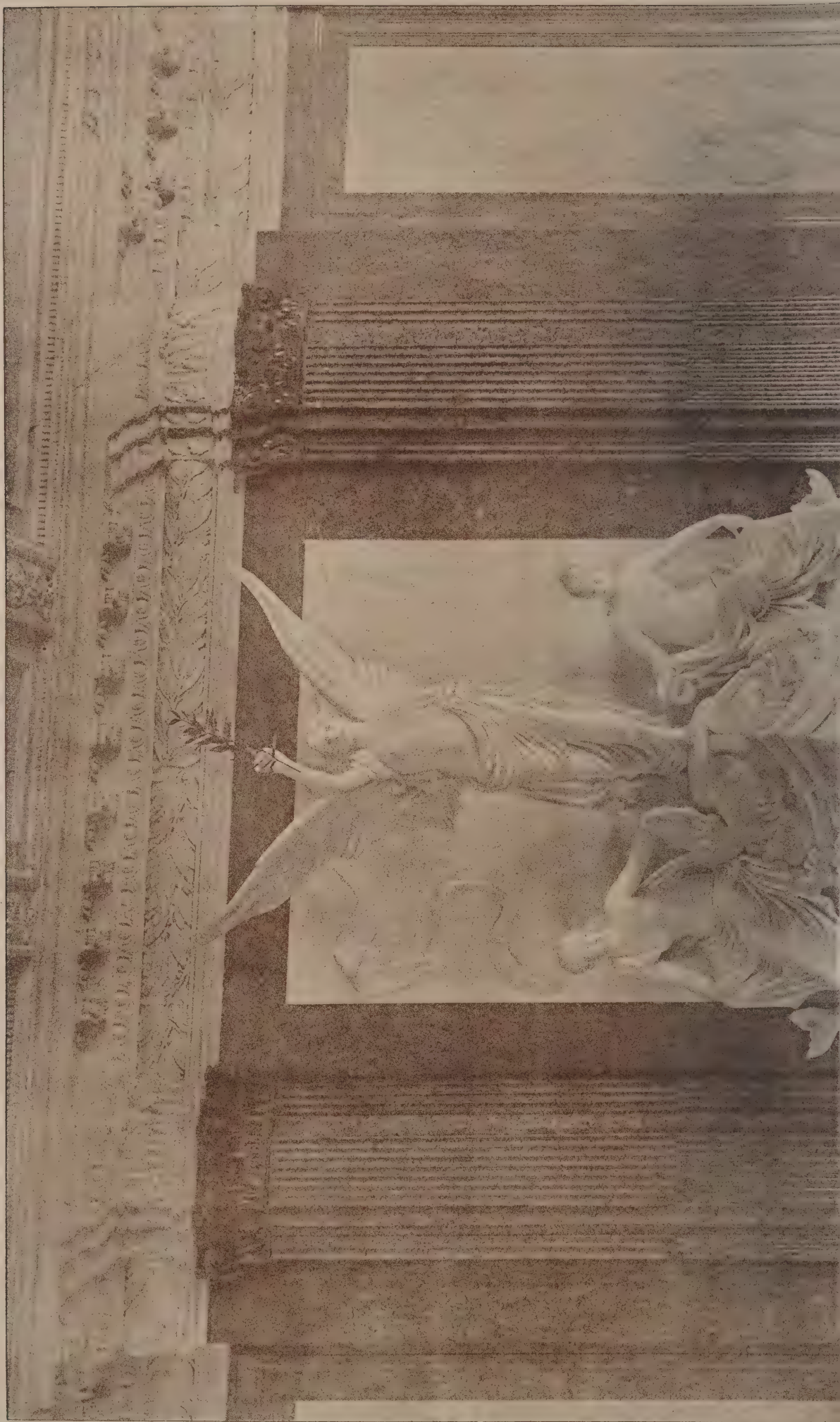
WE have lately drawn attention to the growth of a disinclination among municipal and other local authorities to be troubled with many competitive plans for new buildings, and pointed out its danger. The same tendency is being exhibited in dealing with builders' tenders. The case of the proposed asylum at Horsham is an instance. According to an approximate estimate, that building will cost at least 150,000/. The committee having charge of the arrangements announced to the County Council, through the Duke of RICHMOND, that only a limited number of tenders would be invited. One reason given for the proposal was that if the competition were general, the Council might find themselves saddled with a contractor who would be unable to complete the work. But that contingency might surely arise if the competition were left between a pair of contractors. It is the business of the Council, their architect and lawyer, to provide as far as foresight will enable them against loss from a breakdown. Another member said that the best builders would not take part in an open competition. We often hear of a resolve of that kind, but it is mere "sound and fury, signifying nothing." There are few, if any, of the largest builders who could afford to let an opportunity of gaining a job of 150,000/. go by for the sake of dignity or etiquette. The Duke of RICHMOND was more frank when he said that, if unlimited competition were allowed, there would be no end to the number of tenders they would receive. It is onerous that his Grace and other Sussex noblemen and gentlemen should have to wade through documents of the kind, but they should not have accepted office unless they were prepared to encounter all its troubles. As a fact, unlimited competition does not necessarily mean an unusual number of tenders. Builders are too shrewd to run the risk of attempting contracts which are beyond their strength, and there is, moreover, the difficulty of finding sureties to uphold them in excessive risks. Financial societies, in ignorance, may be ready to attempt constructive feats without a chance of obtaining profit, but in such cases there is generally security enough to compensate a building owner. The Sussex committee apparently wished to restrict the competition to three or four firms, which, we admit, would be the pleasantest way of discharging a public duty. The Duke of NORFOLK, who has had no small experience in building works, insisted on at least eight firms taking part in the contest. Another member proposed twenty, which would be barely sufficient for a work of the kind. LORD LECONFIELD and Mr. W. E. HUBBARD suggested the number should be twelve. As opinion was decidedly against a sacrifice for the sake of securing the ease of the committee, the Duke of RICHMOND announced that, after what had passed, he had no doubt that the committee would invite twelve firms to send in tenders. Public bodies and, we may add, private clients, will consult their own interest by taking a lesson from the action of the Sussex Council. If contracts are to be a sort of pastime, there is no doubt the fewer the contractors the stronger the certainty of attaining that end, but pastimes generally mean outlay, and, if economy is desired, clients will find there is an advantage in allowing many builders to struggle for the contract.

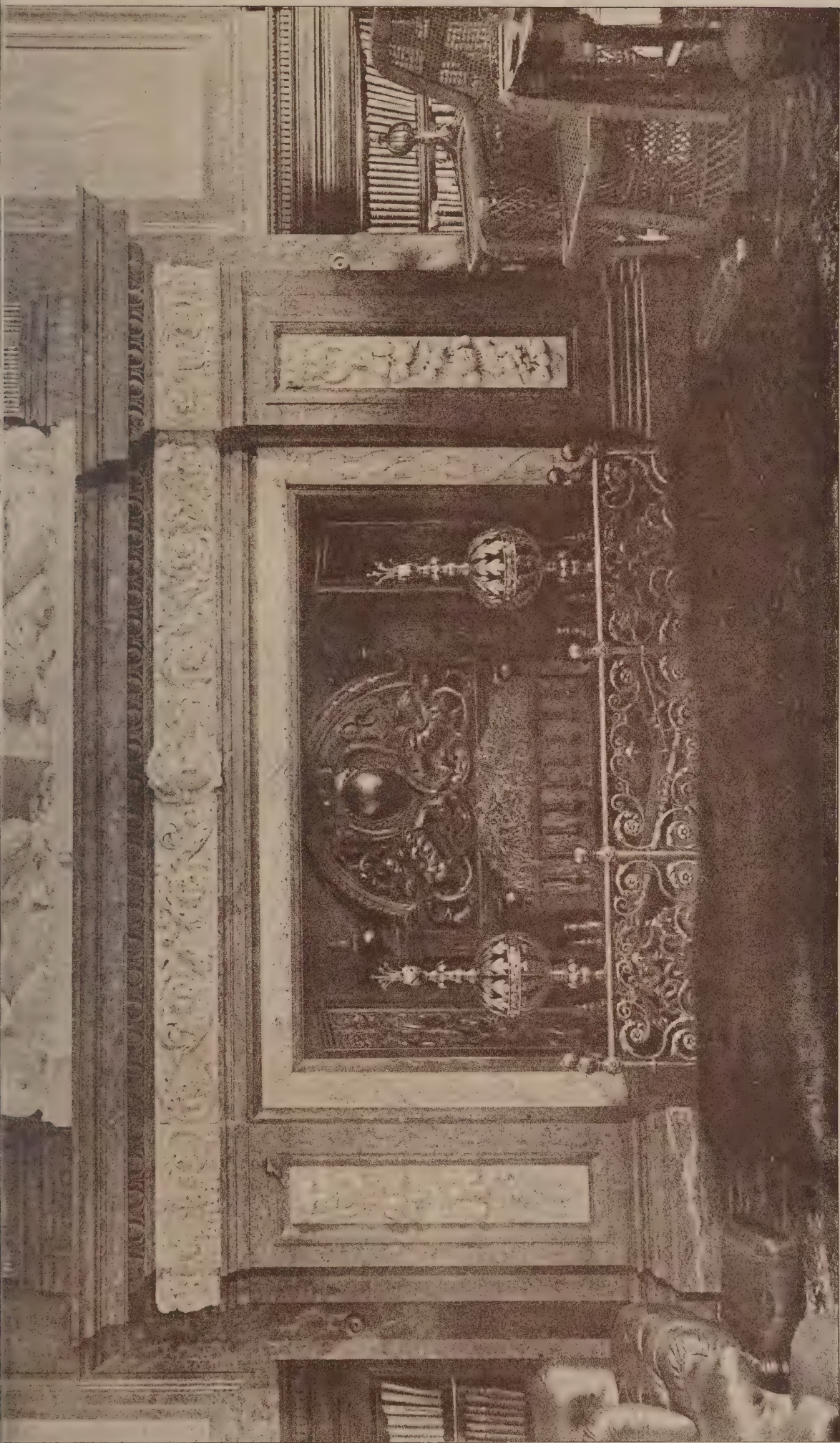
THE Metropolitan Building Act, 1855, section 27, sub-section 4, prohibits the erection of buildings for the purposes of trade or manufacture containing more than 216,000 cubic feet, unless divided by party walls in such a manner that each division of the building does not exceed the above-mentioned number of cubic feet. The London County Council's General Powers Act, 1890, section 29, gives the Council power to approve, under certain conditions, of buildings for trade or manufacture containing more than 216,000 cubic feet, but not exceeding 450,000 cubic feet. These provisions are proposed to be re-enacted in the London Streets and Buildings Bill promoted by the London Council, and now before a committee of the House of Commons. The Royal Institute of British Architects object to the expression "cubical content," and wish to substitute for it the words "cubical extent." This alteration was agreed to by Mr. LITTLER, Q.C., who opposed the Bill,

with the remark, "I raise no point upon that; if it amuses the architects, it does not hurt us." The change is made with a view to meet a difficulty as to the mode of measuring the cubical contents of a building, whether the walls and the space under the roof should be included in or excluded from the measurement, but it will not have that effect. The words "cubical content" have a definite meaning, and there ought to be no difficulty with regard to them; they mean the space contained within a building exclusive of the walls. All measures of capacity are exclusive of the vessel in which they are contained, and in measuring the cubical contents of a building the walls should be excluded. The word "extent" is not an appropriate word to define cubical capacity; it is derived from the Latin *extendere*, "to stretch out," and is properly applied to superficial admeasurement alone. In the absence of any direction as to the manner in which the cubical extent is to be ascertained, the same difficulty will be experienced as is said to prevail under the present Act, and nothing will be gained by the substitution of a word. When the Bill arrives at the House of Lords and is subjected to the searching scrutiny with which it has been threatened, the Peers may perhaps find time to take up the question of contents or non-contents as being more familiar to them than the humdrum way of putting the question in the House of Commons.

THE appeal in the action that arose out of the sale of Farringdon Market has been heard and determined. The circumstances were novel, and have been already described in this Journal. The property was purchased in March 1892 at an auction by Mr. H. T. TUBBS for 98,100/., and he paid 10 per cent. deposit. In the conditions of sale it was stated that if the balance was not paid on June 24 and the purchase completed—unless through wilful default by the vendors, the Corporation of London—interest at the rate of 5 per cent. should be charged to the purchaser. It was discovered that the title to a part of the property was erroneously described, and the sale was not in consequence completed until February 1893. The vendors, however, argued that they had made out their title by September 29, and claimed interest to that date. Mr. Justice CHITTY took the same view, and considered there was no wilful default on the part of the Corporation. Mr. TUBBS appealed. It is not often that Mr. Justice CHITTY's decisions are reversed in a superior court, and this case was not one of the exceptions. As we pointed out at the time, it is extremely difficult to prove "wilful default" on the part of a Corporation. There could be no doubt there was negligence or oversight in describing the property as being acquired under the authority of one Act of Parliament, when one-tenth of the area was a much later acquisition. But neither Lord Justice LINDLEY nor Lord Justice LOPES, while admitting the error, could accept the theory that it arose out of a default that was to be considered as wilful. Lord Justice KAY endeavoured to look at the circumstances as they would appear to the purchaser. "The purchaser urges," said his lordship, "that the default was 'wilful,' because the person who made it willed not to make the search which it was his duty to the purchaser to make, before making the positive statement in the conditions. I am not able to find an answer to this argument which is satisfactory to my mind. If the vendors had not made the positive statement as to all the land being held under the statute referred to, or if, having made it, they or their agent had taken some steps to verify it, and had in so doing committed a *bona fide* mistake, the case might be different. But, according to the evidence, no attempt to verify the statement was made, and the omission to do this was not only a 'default,' but was a 'wilful default,' because it was a deliberate neglect of a duty to the purchaser which the vendors, by making the positive statement, voluntarily assumed." Lord Justice KAY, however, considered that the purchaser had, by his acts, contributed to the delay in completing the transaction, and on that account he agreed with his brethren in upholding Mr. Justice CHITTY's decision. The result is not satisfactory, but it should be accepted by builders and purchasers of building estates as a warning of the risks they incur when they accept the responsibility of proving that somebody's defaults are wilful.

The Architect, May 18th 1894.





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INZ. PHOTO. SPRACUE & CO 48, 5, EAST HARDING STREET, LONDON, E.C. 4

CHIMNEY-PIECE: TRING PARK, TRING.

The Seat of LORD ROTHSCHILD.

T. WALDO STORY, Sculptor.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

A HOUSE IN BED
R. NORMAN S

May 18th 1894.



IN A PHOTO SPRACUE & CO 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

ORD PARK, CHISWICK.

W, R.A., Architect.



"ASHCROFT:"
WILLIAM F. UN

May 18th 1894.



GARDEN FRONT.
ORTH, Architect.

Printed by J. Rogers & Co. 4 & 5, East Harding Street, Fetter Lane E.C.

ILLUSTRATIONS.

CHIMNEYPiece, TRING PARK, TRING.

A HOUSE IN BEDFORD PARK, CHISWICK.

ASHCROFT, GARDEN FRONT.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association took place on Friday evening, Mr. E. W. Mountford, president, in the chair.

The following were elected members:—Messrs. R. Anson, N. M. Doncaster, E. H. Rouse, A. B. Venables, W. J. Walford and F. C. Young.

The annual dinner it was announced would take place on the 31st inst.

The house list, as arranged by the Council, was formally nominated, Mr. Pite and Mr. Cooper being nominated for the office of vice-presidents by certain members of the general body. Messrs. Brodie, Wonnacott, Greenop and Whately were appointed scrutineers of the ballot.

Mr. HENRY LONGDEN then read the following paper on

Practical Hints on the Working of Wrought-Iron.

Wrought-iron is one of the most useful and necessary materials which the needs of man have discovered. It has been used from early ages, and its widespread use is easily explained from its strength in proportion to its bulk and its cheapness. It has been used for railings, screens, balconies, balustrades, chains, anchors, cramps, stanchions, chests, all kinds of supports, implements for use about fires, hinges, locks, window fastenings, and numberless other uses which would be tedious to recapitulate.

The material, too, is one which has to be worked with heat in all genuine smith's work, and it requires strength of arm, sureness of eye, dexterity of hand and great judgment. A little over-heating in the fire, a little over-hammering and the metal is spoiled, and the work has to be done over again. There is something fine, strong and masculine about good iron-work, and each curve, swell or play of line in a piece of forged work has to be got by good hard blows which the finished work expresses to the mind, although the observer may not know what effort has gone to produce the result he sees.

The iron is now bought from the manufacturers in bars or rods, and in this material especially quality is of great moment, as ironwork in connection with architecture has usually some office to perform in which strength and lightness are both sought for; the quality of the iron should be looked to, as inferior iron has neither the strength nor the power of resisting the destructive effect of the atmosphere which good iron has. There is a point, too, which causes much difference between old and modern work, in the regularity of the making of the iron bars or rods. In old times these were drawn out on the anvil from lumps of iron, and now they are rolled between what are called "rolls" of iron with grooves turned in them. The hot metal is made to pass through the rapidly-revolving "rolls," and a bar 12 feet long will be quite of the same section and size from end to end, whereas the bar made by the old process would be irregular in thickness, which, in certain kinds of work, adds charm to the design. I have found it necessary in some work to heat and hammer the bars to give them some of the irregularity of surface of the old work.

Before beginning his work the smith takes his bar of iron and examines it, springs it by shaking it, and tests it generally as to soundness and quality. For bars in railing (such as some here) the iron has to be looked along to see that it is out of twist and straight. He then heats the bar in the fire and brings it to the anvil, on which he may work it alone, or with a "striker" or "drummer," or with more than one if the work is heavy. The smith directs the "strikers" with his hammer, which is a lighter one, how and where they are to strike with their heavier hammers, and he can indicate the force of the blow he wants. The working together of two or more men on the glowing mass of iron drawn from the fire, the perfect understanding without words which they show, and the shaping from the bright red mass of the object to be made, passing through cherry red to dull red, and finally to a grey blue, is one of the pleasantest things I know to witness. The tractability of the material and the way in which a fine and delicate object can be made out of a rough mass, with almost no waste of material, is a great lesson in the superiority of mind over matter. I know of no material which exemplifies this in a large way so well as iron.

If a bar or rod is to be used in railing, with a head, such as is seen here, a thicker piece is welded on to the bar, and it is drawn down with the hammer, as you see in the specimen, to a taper shape or to any other shape that is required by the design. Where the heads are drawn smaller, as is the case

with the square bars, and there is great repetition, a "swage" or "stamp" is made, which makes them more readily and makes them all alike, which is the more economical but less artistic way of doing the work. In St. Helen's Church, Bishopsgate, after the numerous changes and sweeping away of monuments, there are some good examples of this kind of work, notably round the tomb of William Kerwin, where very light iron, only $\frac{3}{8}$ -inch square, set angleway, is made into a close railing, the heads are of various lengths, and the forged collars and finishing knobs at different distances in the heads, yet the effect is good and free. Sir Julius Addiman's tomb-railing, of which I made notes in 1890, appears to have gone. This was a stronger railing, still very close, and with fine twisted corner pillars, made of four $\frac{3}{8}$ -inch square bars twisted together, with square moulded caps and bases, and long twisted pinnacles finishing with balls.

The mode of making the rails or the long horizontal bars for railing varies much, and the effect to be got by these is worth consideration in designing railing. The simplest and cheapest way is to take the ordinary flat bar and punch out the holes by machinery. This is almost of necessity the plan used for large quantities of railing on account of cost, and the holes punched may be square or round. When the work is smaller, as in internal grilles or small gates, the effect of swelling out the rails, as shown in the examples, with round swells to suit round bars, or with swells for square bars, set either square-way or angle-way, is richer. The perspective, in which we really always see this kind of work, is much enriched by the breaks in the horizontal lines, and the extra cost caused by swelling out the rails is found to be well bestowed in greater elegance of effect. The rails used in this way need not be so large as when straight flat bars are used; the width of the iron must be enough to allow of the holes being punched without danger of bursting out the iron on each side of the hole, whereas in these examples you will see that a rail $1\frac{1}{4}$ inch wide is swelled out to $2\frac{1}{2}$ or even 3 inches where the bars pass through it. If a flat straight rail were used, not less than $2\frac{1}{4}$ inches would be needed for the holes for $\frac{7}{8}$ -inch square bars such as you see.

The effect of square upright bars set square-way or angle-way is also worth considering in designing railing and grilles. The perspective in which one sees them has the effect of making the square-way square bars look the richest, as you get the two sides wherever you see the railing. When the square bars are set angle-way you may see practically only one side, and the effect is poorer, though the diagonal projections in the rails make a kind of decoration. The round bars have a pleasant softness of light and shade, but where strength of effect is wanted square bars are to be preferred.

For gates strength in the framework and staying with horizontal lines is to be recommended. In the way of treatment of the iron, the grain or the lamination of the metal in the lengthway of the iron must not be forgotten. The bracket-piece I have here, which forms the end of a horizontal bar of a gate, with its tenon prepared to rivet into the mortice to be cut into an upright bar, looks a simple and straightforward piece of work, but it has taken a good deal of making. It is first made as A, with a hole through it; the tenon is then rivetted into it, the way of the grain being the lengthway of the tenon (see B), and then the remainder of the shoulder and the rail to form the horizontal bar is welded to this piece of work, making what you see. I have known instances of smiths attempting to cut the tenon out of the solid lump, and so shaking the iron in the process that the grain was destroyed and the tenon fell off. If this does not happen the iron is weakened, and that which should be one of the strongest parts of a gate, having to resist twisting, thrusting and sagging, is not able to do its work adequately, and the gates will give way much sooner than they would if well made. If you examine this piece of forged work you will find a slight indication of the weld I have described. This piece of work, like the other specimens I have here, is practically as it left the hammer, no filing having been done, except a little with a rasp where it was necessary to get off the scale which the iron throws off when it has been heated. I may here say that hammer-made, as contrasted with filed-up wrought-iron work, should always be sought for and required. This remark applies to black work; where the ironwork is polished, which is a very beautiful treatment for small and very rich work, the whole surface has to be filed and finished up with emery.

The treatment of iron in forming scrolls is one of the characteristic ways of working this metal, and one to which no other metal or substance with which I am acquainted will lend itself. The iron is taken of an agreed size, and is heated and drawn out, thinned, either spread in the thinning or kept to the same width throughout, and then rolled up entirely by the eye and the skill of the hand. There are steel templates made, round which these scrolls can be turned, but the result is, as might be expected, a dead uniformity and a loss of all life in the work. There are here examples of three ways of forming scrolls, of which each has merit. The more the iron is drawn out the closer it may be rolled up to look well.

These scrolls often spring from stems which are prepared with short starting-pieces (see example), and the scroll is welded to the starting-piece, care having to be taken to make the welding places at such distances from one another that they are not too often heated in the fire during the weldings. The end of this stem is shown "scarfed," so that a bar can be welded to it without a diminution of bulk at the point of welding. The two bars to be welded are brought to a white heat in the forge, are then laid together on the anvil, are brought by gentle blows of the hammer into their right places, and are then, by strong blows, firmly united, so that a good weld makes of the two pieces of iron one. This quality of the power, without any other substance being employed as solder, or making the two things indissolubly one, is a special quality of iron.

There is here a piece of work showing the forming of scrolls, the welding together of two pieces in which the main line of the design runs in the same direction, and the welding on of a hammered leaf. The preparation for welding the scroll is done similarly to the piece with the leaf in the centre.

The forming of the forged leaves is an interesting part of the work. A blank (A) is first made, which you will see is well hammered. It is then hammered into a V-section (B), and you will observe the force of the strokes necessary to bring the iron into the curved form at the edges of the sheath. It is then worked further, serrated, the eyes cut and modelled, until you find a well-modelled leaf like that before you. This is a special branch of the work, as you will see, and the fine, bold modelling requires much skill and practice. In much of the work done, both in older and more recent times, the leaf-work is hammered out of thin sheet, and is then fitted with "checks" filed out of the main lines of the work, so that the thickness of the leaf shall not break the suavity of the line. The leaf is then rivetted on, and often brazed too, but that is not the best smith's way of doing work, and is not so enduring, as the thinner iron is sooner destroyed by rust.

There is here another piece of work in which the bar is drawn down and twisted at the top, and two leaves forming a sheath are welded on it. You can just see where the thickness of the leaves melts into the stem, and just this amount of variation in the line gives life and vivacity to the work.

I do not follow out this part of the work, as the fine beaten work in iron, black or polished, which can be done would lead me rather away from smith's work, which is pre-eminently wrought-iron work.

Another treatment of iron is carving it as you see in the head here and in the snake. This kind of work lends itself well to grotesques. It was carried out in the Renaissance times with great delicacy and beauty, but while it will add interest to small works, it is too difficult to be worth doing, except in a small way, in a material which is so intractable, which is only another way of saying unsuitable, for the purpose.

The small quatrefoil is an example of welding, first of each trefoil point with the two branches springing out of it, and then of bending the arms and welding them together in the centre of each lobe of the quatrefoil. This work has to be done very accurately when these quatrefoils have to be banded together to make sheets of work, but it may be done so that each quatrefoil has an individuality of its own, and that the dead mechanical uniformity which is the blight on so much modern work may be avoided.

There are intricacies of halving bars together, by which is meant filing out of each of two bars meeting one another mortises, so that when put one with the other the two bars take up only the room of one, but this weakens the iron very much, and is not to be recommended. It was principally done in work where a flat surface was desired.

Twisting iron is another characteristic treatment. It is to be remembered that a twisted square bar takes more room when twisted than when plain, and it cannot therefore be passed through the hole which would take the plain bar, but it is possible so to reduce the bar to be twisted as to make it very little if at all larger than the plain bar. When twisting is done in large sizes of iron this reducing before twisting must be done, otherwise the twist looks coarse. Twists of two, three, and even four strands may be done, and in some of the late Mediæval work a good effect was got by grooving the iron bar and then twisting it. There is a good example of this in the ante-chapel of St. John's College, Cambridge. Round rods of small size can be welded together and twisted—indeed, a small form of this, swelled out in the centre, has become a commonplace in the shops, and is, as always in such cases, greatly misapplied. I have seen it used as short pillars in a fender, while the very reason for it is either that it is wanted to relieve what would otherwise be a dull length of bar, or as a termination like a handle. It is one of the small clevernesses which are easily overdone.

The setting out of ironwork for staircases where there are curves and vamps is difficult, and a running pattern rather than one which sets out in panels or smaller repeated parts is to be avoided. The difficulty can be overcome, but the result does not seem to be worth the trouble required to attain it.

I have here some examples of old and modern work which are exemplifications of points I have named.

The grave cross is a piece of Swiss work, and shows welding and scrollwork, split at the ends, moulded and spread out into rams' horns in a manner very characteristic of late German and Swiss work. It is too florid in style, but is a marvel in its way.

The oblong panel is also a piece of Swiss work, and is noticeable for the fine design of its main lines and for the way in which the iron is beaten out thinner from the main thickness, is formed into leaves, then goes on again as flat iron in a reduced form, and finally finishes in a leaf and a sharp point. The thistle suggestion is here very plain, but the thistle is nowhere so used as to become naturalistic: it always keeps within the bounds of ornament.

The bracket is English work, and is a good example of the seventeenth and eighteenth-century work so common about London. The little naturalistic touch of the bay-leaves among the set lines of the scrolls is very pretty.

There is a panel of Mr. Sedding's work here which was made purposely with great irregularity in the scrolls and in the ornaments. The only binding points in this work are the points of contact of the scrolls, and a general similarity of shape in the scrolls is kept, but after that the smith was left quite free to form the work to his fancy. Looked at in the full-face way it looks very irregular; but if you were to see this work forming a side screen to a chancel, where one of our best late architects had had the chancel screen made in an admirable manner of strict regular Mediæval design, you would see where the life was in the ironwork.

The panel with two large roses is a piece of Mr. Sedding's work for Holy Trinity Church, Sloane Street. It is an epitome of that work, which he said was the best ironwork he had done. In its abundance of line, in its profusion of ornament, and yet in the subordination of the smaller to the principal parts, it is a good example of Mr. Sedding's work. The screens at the side of the chancel steps are of plain bars, with a wonderfully curved and ramped capping; and up the centre of this comes a free undulating stem, which rises above everything and bursts out into sprays and blossom, as one has seen a bunch of wild rose rising up out of a hedge. Only a master like Mr. Sedding could do such daring things, but he justified himself by his work.

The small panel of quatrefoils is a study I had made from a piece of Venetian work of a rather smaller size. It is a good example of their Gothic ironwork, and you will find the scrolls forming the quatrefoils are not regular, nor are the points clasped in the bands, nor are the bands, though I fear they are more regular than the old example from which it was studied. The lacing of the bands into the frame is an interesting point in this work, and it makes it very strong.

I have here in the ground-floor vestibule, by the permission of Messrs. Florence & Satchell, a piece of ironwork forming part of a railing for the front of a building. It exemplifies many of the matters on which I have spoken, such as the heads of the square bars drawn out by the hammer, the welded work in the pilasters and the drawing-out of the iron in the scrolls. The banding of the work together, and the contrast of rich and plain, the change from the plain upright bars under the plain uprights and the contrasts of rigid and curved lines are points in the design to which I would draw your attention. I am sorry that the piece of work is too large to be brought up to this room, and if less had been shown you would not have been able fully to appreciate the design.

Much ironwork is being done now, more than has been done for many years past, and there is a plethora of the pretty and meaningless work. I was sorry to see at an exhibition promoted by the Blacksmiths' Company lately very little work which I should consider really smith's work. Fire-screens, lamp brackets and other small things were the staple of the exhibition, and florid, meaningless ornament was abundant. It may be that in a room it is difficult to show important pieces of work, but in only one or two cases did I see any indication of feeling for wrought work, by which I do not mean thin iron bent cold into intricate forms, but works formed in the manner I have before described. This kind of work lends itself to making combinations of scrolls, flowers &c., of stock sizes, and we are now offered flowers, leaves, bosses and other ornaments wholesale. I need scarcely say here that this is not the way to good work, and that the work of old times, which we study and admire, and on which we found our own work, without direct copying, of course, was not done in this way.

There is great fashion in these matters. I remember when Gothic hinges, often of very fine design, handles and certain screens in cathedrals were the only ironwork made. Now I am sorry to say that the making of hinges is less in fashion than it was. The making of a hinge which clasps both the front and back of a door, with the knuckle thrown out to suit the pin, and the work in front of the door well drawn out, thinned down and hammered into ornamental form, is one of

the best tests I know of a good smith. There are still fine screens made, but the domestic use and the ordinary use of ironwork has so increased that no skilled man should want employment.

If architects will require good work they can get it, and the understanding of the points of ironwork practically is much greater than it was some years since.

Mr. ARTHUR KEEN proposed a vote of thanks to Mr. Longden for his paper. The paper he had liked, especially because Mr. Longden had treated of methods of working. Mr. Gardner's lecture on pewter at the Society of Arts had nothing as to how the work had been done. Architects should get ornament by means of natural and unostentatious treatment of materials. Builders had hard work to follow architects who designed in the wrong way. The ironwork of the Amboise balcony was of most simple but effective design. The swellings of the joints and the passing of one set of bars through the others and reversing the process was, however simple, most effective and economical as to cost.

Mr. W. H. WHITE seconded the vote of thanks. He called attention to the excellent old railings to be seen about many houses and in the squares of London. Work also in the provinces and in Sussex should be studied, and then there would not be seen to be much meretricious work.

Mr. E. GREENOP alluded to lock and hinge-work in South Kensington Museum. Looking at Mr. Sedding's beautiful iron panelling, he supposed that Mr. Longden had meant to say that such design in metalwork was to a certain extent justifiable.

Mr. H. A. SACHELL asked for information as to how they could produce the best effects at the least cost; also whether there was any reliable process for preserving ironwork.

Mr. H. W. PRATT said he was glad to hear Mr. Longden condemn over-elaboration in ironwork, notwithstanding that much had been designed by eminent architects.

The PRESIDENT said that the use of iron could be carried beyond proper limits, and it was possible, as in Mr. Sedding's work, to get outside the proper use of the material by too realistic treatment. He preferred bars set angle wise to square. Set anglewise they looked bigger, and also he thought they would resist pressure better. Some years ago a process for enamelling wrought-iron had been invented. Then there was a point as to how to design scrollwork, &c., in wrought-iron, which was to be fixed about 50 feet above the eye. The President then put the vote, which was carried by acclamation.

Mr. LONGDEN, in course of reply, said that he did not see Mr. Gardner present, though he had expected to see him. The swell-out joints, he said, had a beautiful effect, and were one of the highest kinds of enrichment got in the simplest manner. Much of the old ironwork in London was extremely valuable. There was certainly a valuable collection at South Kensington, but the gallery was too dark, and it could only be seen in silhouette. Notwithstanding the comments that had been passed he praised Mr. Sedding's work that was shown. As for protection of iron, he thought little of the various processes, as in a few years nothing more was heard of them, whereas if they had been of practical good they would have still been to the fore. The best protection was to soak ironwork at dull red heat in oil at the forge, and then paint it with good oil-paint—genuine oil-paint. All designing in ironwork should be doubled in size to show proper effect at 50 feet above the ground. High chancel-screens were not to be condemned because they appeared like webs. Moreover, they could be coloured and gilded, but it would be a great error to gild them entirely over.

JERPOINT ABBEY.

ON Tuesday there was an excursion of members of the Royal Society of Antiquaries of Ireland to Jerpoint Abbey, on the river Nore, co. Kilkenny, which was founded in the eleventh century for Cistercians by Donal MacGiolaupaudric, Prince of Ossory, and Felix O'Dullany, Bishop of Ossory. The ruins occupy an immense area. The following catalogue of the sepulchral monuments was compiled for the occasion by the Rev. Canon Hewson:—

Along the north side of the choir are ranged three niches, of which the moulding is for the most part broken away, but there are remains of the dog-tooth ornament. They contain four slabs, which have been in recent years raised upon rough masonry, after the fashion of altar tombs.

In the easternmost niche are two effigies side by side. The outer one is an ecclesiastic in alb, stole and chasuble. The chasuble is of ancient pattern like that of Bishop de Ledred's in St. Canice's, Kilkenny, not slit at the sides to admit of the hands being more easily brought forward, but gathered up at the elbows, and thence falling in ample folds. The feet, clad in socks without shoes or sandals, rest on a dog. The right

hand is uplifted, with the thumb and next two fingers extended, in the act of benediction. The left hand holds a pastoral staff, with its floriated part turned outwards, as is supposed, to indicate jurisdiction outside the abbey, *i.e.* the jurisdiction not of an abbot but of a bishop.

The inner figure in the same niche is also an ecclesiastic, holding with both hands a pastoral staff, of which the top is broken off. The feet rest on a bracket ornamented with conventional fruit and foliage of the style apparently of the latter part of the thirteenth century, and the whole figure rests on a mattress, ornamented all round in the same style. The vestments consist of an alb, with "apparel" at the lower part; a chasuble of decidedly later pattern than that of the other figure, though this by no means implies that the monument is of later date. It is slit up at the sides to admit of the free use of the hands, and is fitted to the figure. The girdle appears under the chasuble. On the maniple is a short fringe, and the head is covered with a cap. Neither of these slabs bear any inscription.

The next niche contains a coffin-shaped slab, with a short description rudely cut in incised Lombardic characters. The "HIC JACET" is quite plain, and so is the date "MCCC." The name of the deceased is injured, but it begins with "UI." There appears to be a second "HIC JACET," in memory of a second person. The centre of the slab is occupied by a human figure, cut in relief upon a sunk panel. The figure is equipped like a huntsman or light-armed warrior. A short skirt reaches to the middle of the thigh, a small bag or scrip hangs at the right side, by a strap over the left shoulder, and the right hand holds a spear. The prefix "UI" before the name indicates an Irish chieftain, and the dress and equipment is, no doubt, that of an Irish chieftain of the period. Over the head is a hole, about 5 inches square, cut through the slab.

The slab in the westernmost niche is also coffin-shaped, and is inscribed in memory of Edmond Walsh and Johana le Botiller. In the centre is a floriated cross, the arms of the Passion, and the Walsh arms—a chevron between three pheons reversed.

On the floor of the choir are two floor slabs. One near the south pier is inscribed to Peter, the son of James Butler, and Isabella Blanchfield, his wife, A.D. 1495. The inscription on the other floor slab is much worn, but with pains it might be read.

Under the tower is an altar-tomb inscribed on the top to Robert Walsh, who died A.D. 1501, and Catherine Poher his wife. In the middle of the slab is a floriated cross on a calvary and the Walsh arms, a chevron between three pheons reversed. On the south side of the tomb is a figure of the Blessed Virgin Mary, crowned, holding a lily in her hand, the Infant Saviour on her knee, and an inscription to Walter Brenagh (the Irish form of Walsh) and Catherine Butler, his wife.

On either side of the choir there are two chapels, four in all. The one adjoining the choir on the south has in the south-east corner an altar-tomb. On the top slab are two incised figures in chain armour, holding up with both hands very large cross-hilted swords. One figure has a visor closed, the other apparently none; both wear prick spurs. There is no inscription.

The ninth and last monument in this part of the church is an altar-tomb opposite the entrance to this chapel. On the top are two recumbent figures. The man in a loose civilian dress, with skirts or petticoats to his ankles; a harp is slung from his girdle by his right side; his right hand, pressed against his breast, holds something which may be a sceptre or staff, but it is broken off short, and the feet are clad in shoes. The upper part of the female figure by his side is broken off a little above the girdle and elbows. The sides of the tomb are ornamented with figures of apostles and saints in richly-moulded niches. One figure holds a saw; another a money-bag; another something like the five barley loaves; a fourth figure is winged and bears an infant in front. The inscription has been almost entirely knocked off. There remains but "Hic jacet Willmus," and fragments of three letters of the next word.

Near this last tomb, in the north-east corner of the cloisters, is an illustration of the legend of St. Christopher, similar to that seen at Kilcooley Abbey in the excursion of 1890.

In "Notitia Historica," by Nicholas Harris Nicolas, of the Inner Temple, bound up with "Memoirs of the Grace Family," by Sheffield Grace, London, 1823, are three long Latin epitaphs, in all thirty-four lines, or a full page, taken from Jerpoint Abbey. They are all in memory of members of the Grace family, viz. Sir Oliver Grace, of Legan, Carney and Ballylinch Castles, his wife Mary, one of the FitzGerald, of Decies, and their son Gerald, of Ballylinch, who died A.D. 1618, and his wife, Margaret Hartpole (of Shrule Castle, Queen's County), who died in the following year. None of these epitaphs appear to exist at Jerpoint now, except five lines, part of the epitaph to Mary Grace, *alias* FitzGerald. It is built into the west wall of the church. In this Mr. Nicolas has misread the date 1605 for 1515, and apparently a couple of words beside.

THE EXPLOSION AT WALTHAM ABBEY.

IN a letter to the *Times* the Rev. E. Mansel Townshend, M.A., curate, Waltham Abbey, offers the following remarks which deserve the consideration of the Government:—

In regard to the terrible disaster here on Monday, the 7th inst., it appears to me that sufficient attention has not been drawn, either at the inquest or in any report or article that has appeared, to the close proximity of the danger-houses of the nitro-glycerine works, and of the gun-cotton works, and of the nitro-glycerine magazine to a country town like Waltham Abbey, and to the men and lads at work close to these establishments in more or less dangerous workshops on Quinton Hill, every one of which—a dozen or so good-sized buildings—has, as any one can see, been battered by the recent catastrophe. Every one of these buildings contained quantities of either nitro-glycerine, gun-cotton, or cordite, and the more dangerous of them (incorporating houses, &c.) are closely packed together within about 50 yards of the great magazine which was blown up, containing, as it did, over a ton of nitro-glycerine, and which is authorised to contain about $2\frac{1}{2}$ tons. None of these workshops are protected from one another by earth-works or any other form of protection, nor by any safe distance from the magazine, which was fired by concussion (or by a trough connection) at a distance of 60 yards from the fortified washing-house, which first exploded, and 50 from the workshops or thereabouts, and exploded almost simultaneously, and yet above 100 men and boys are kept in these workshops and were there at the time.

The coroner acknowledged the narrowness of their escape, and the Government evidently recognised the extreme danger, as is shown by the thickness of the great walls of the magazine, washing and nitrating-houses, which were 10 feet thick, and are now two of them in ruins. Yet when a juror suggests that smaller quantities of nitro-glycerine might be stored by distribution, he is informed by Her Majesty's superintendent that there is "no room" to do this upon Quinton Hill, and that "an explosion in one house would communicate the explosion to another house." And this is at once accepted as a sufficient reply.

Now, this state of things is not the fault of Her Majesty's superintendent. That gentleman's reply, on the contrary, amounts to a statement of the gravest character, which affects others and not himself; and fear of censuring one whom we all hold, not only blameless, but greatly honoured and beloved in this place, should not have released the jury from their duty in calling attention to the fearful risk and the really criminal folly on the part of the Government in erecting workshops and a gun-cotton factory, with hundreds of workers engaged in them, under the lee and within 300 yards of a nitro-glycerine magazine and danger-houses, and the whole of these centres of mischief within 700 or 800 yards of a country town. Had the nitrating-house, containing half a ton of nitro-glycerine in a half-completed and dangerous state—*i.e.* liable to explode if heated above 80 deg. Fahr., or, by friction, if cooled below 50 deg. Fahr.—also exploded either by concussion, the falling of its roof, which actually occurred, or the fierce heat of the fire in the burning washing-house alongside raising the temperature, there is no knowing what would have happened to the town beyond what has occurred, for this great building and its substantial walls (albeit surrounding half a ton of nitro-glycerine) constituted our only (!) protection from the disaster on the other side of it. Surely when the Government attempt dangerous work of this kind it is their elementary and bounden duty to go two to four miles away from any town—many of their workers wisely live that distance off as it is—and to properly isolate, both by ample distance and lofty earthworks, their magazines and workshops from each other, instead of cramming them, without mutual protection, on to a dozen-acre field near a town and close to a villa, which they have ruined in value and safety as a home, without a penny of compensation.

Waltham people may be patient folk, who wish not to quarrel with that which brings them trade; but they have no right to be treated in this fashion, and something must be done to mend this trifling with terrific dangers. The powder magazine, three-quarters of a mile north of the town, contains probably ten times the explosive force of the nitro-glycerine exploded, in tons of gunpowder, by all accounts. This must be totally unnecessary, as it is not intended to be a permanent, but a temporary, store for the purposes of the factory, and to convert it into anything else is to add another danger to this much-endangered town, which ought not to be permitted and must be strenuously resisted.

Witley, Surrey, so long owned by Mr. Birket Foster, was sold by auction on Tuesday for 10,000*l.* The house is decorated with frescoes by J. D. Watson, a stained-glass window illustrative of the Seasons by Sir E. Burne-Jones, A.R.A., and works by Madox Brown and Rossetti.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

RICKMAN'S LETTERS ON THE ARCHITECTURE OF FRANCE AND ENGLAND.

(Continued from page 309.)

LETTER III.

AS the next subject in my comparison of the architecture of England and part of France, I intend, in the present paper, to submit to the Society* a rapid view of my ideas on the progress of architecture in England, from the occupation of the Romans to the period when the Italian style, again imported from Italy, drove out the execution, and for a time almost the study of the intermediate styles, of which so many excellent monuments are remaining.

I feel it necessary here to state, that for the sake of clearness I must assume some dates of buildings, which I am aware I cannot prove by documentary evidence, however well I may be convinced by analogy and a careful examination that the dates are true. But on the subject of documentary evidence, though I have the highest respect for it, yet it very often happens that the most important point, viz. whether the building now existing is the one really referred to in the document, must, after all, rather be collected from inference or analogy than be considered directly proved.

On that part of our architectural history which follows the departure of the Romans from Britain, and which precedes the Norman Conquest, there is of course great obscurity; but while in the days of Dr. Stukeley, Horace Walpole, &c., there appears to have been much too easy an admission of Saxon dates on the mere appearance of the semicircular arch, I think there has been of late perhaps too great a leaning the other way; and because we cannot directly prove that certain edifices are Saxon by documentary evidence, we have been induced too easily perhaps to consider that no Saxon buildings did exist, and have not given ourselves the trouble sufficiently to examine our earlier Norman works to see if they were not some of them entitled to be considered as erected before the Conquest.

I confess I have myself been heretofore of this class of doubters as to Saxon dates; but having in various parts found buildings which are not Norman, and which, from their peculiar construction, cannot well be considered either as modern or as of any intermediate style, I think they must be anterior and therefore entitled to be called Saxon.

I was much impressed by a conversation I had before my visit to France with an aged and worthy dean, who was speaking on the subject of Saxon edifices, with a full belief that they were numerous. He asked me if I had investigated those churches which existed in places where Domesday Book states that a church existed in King Edward's days, and I was obliged to confess I had not paid the systematic attention I ought to have done to this point, and I now wish to call the attention of the Society to the propriety of having a list made of such edifices, that they may be carefully examined.

Having premised thus much, I proceed to state what appears to me to have been the practical progress of architecture in England.

I think it is clear that nothing very good of Roman work ever existed in Britain; all the fragments of architecture which have been discovered, whether large or small, whether the tympanum of a temple as found at Bath, or small altars as found in many places, I believe they were all deficient either in composition or execution, or in both, and none that I know of have been better, if so good, as the debased work of the Emperor Diocletian in his palace at Spalato. With these debased examples we cannot expect that the inhabitants of Britain would (while harassed with continual intestine warfare) improve on the models left by the Romans.

It is not now to be ascertained whether any examples of the actual use of columns with an architrave incumbent were left by the Romans, but we have various examples of the plain arch with a pier; as a specimen the north gate of Lincoln, now used as it was many centuries ago for a gate, is perhaps the most perfect. The plain square pier and a semicircular arch I believe to have been imitated in the Saxon buildings, and this I find actually now a part of Brixworth Church, with a bond tier of what we call Roman bricks (*i.e.* flat tiles) carried through the work. This church has a curious window, in which is used a sort of pier or division, which is very rude, but has a resemblance to a Roman baluster. This baluster leads to one or two other churches, particularly the tower of Barton-on-the-Humber (old church), in Lincolnshire, and Earl's Barton, in

* The letters were addressed to the Society of Antiquaries.

Northamptonshire; these lead by other features to Barnack, St. Benet at Cambridge, a church in Oxford, Kirkdale, Loughton en le Morthen, in Yorkshire, and Repton, in Derbyshire, with a few other churches not yet sufficiently investigated, but altogether affording a series of work evidently not Norman, and in many cases having Norman work in such positions as to show that they must be more ancient than Norman.

I have heretofore met with many plain Norman-shaped arches between the nave and chancel of small churches, which appeared from the mode of construction to be relics of a more ancient edifice, and I am sorry to say that many of these, from the impression of their being only rude specimens of Norman, I have neglected properly to note or to examine whether they might not be Saxon. It is true that these sort of arches require careful investigation, for a plain arch on a plain pier continues all through the Norman style, and with a Pointed arch in the next style.

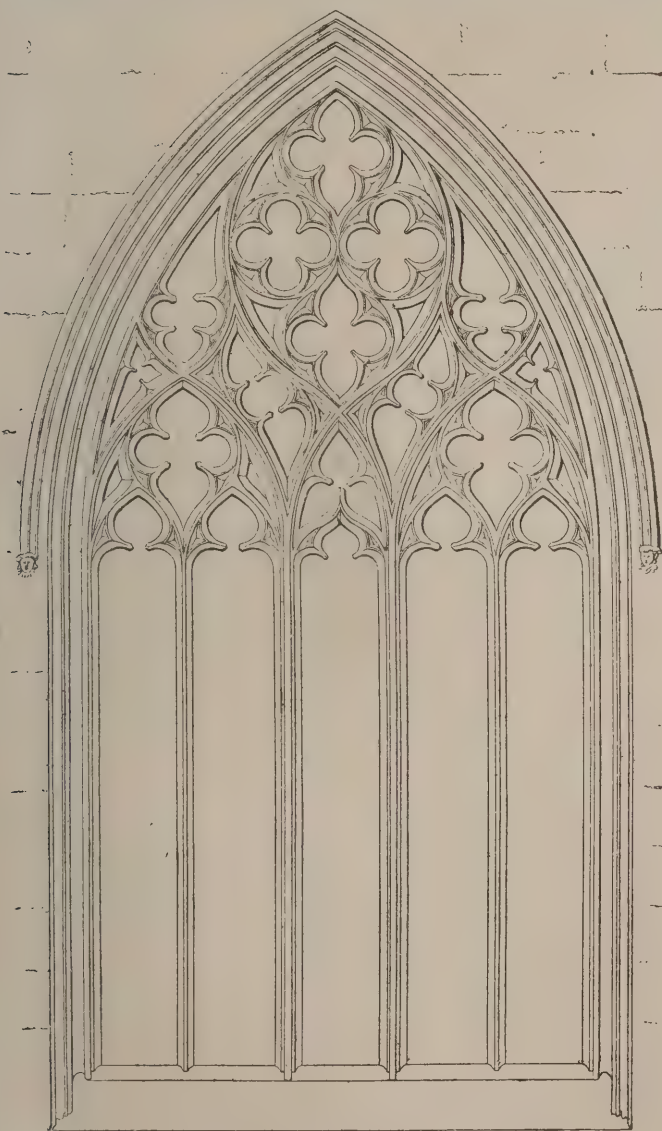
From this plain pier and arch the gradation is practically easy to the Norman style; the round arch remains, the impost remains, and a very little alteration improves the rude shaft of

very short, at Gloucester and Tewkesbury very long; it is also worked with plain as well as enriched capitals.

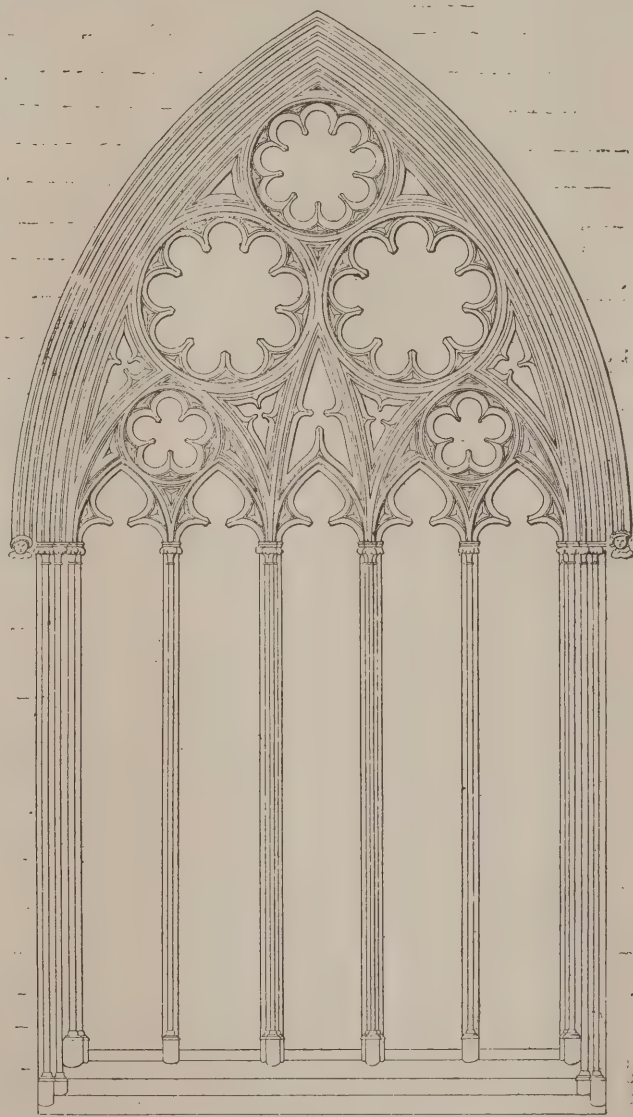
2. The square pier was reduced in size, but added to on the sides or the back and front, sometimes on all of them, by square sinks with shafts of various dimensions, and in a few instances with the sinks only without shafts.

3. In a very few instances, I believe, octagon piers will be found of Norman character.

The Norman enrichments of the capitals, mouldings and other parts are too well known to need description; but one Norman enrichment must be noticed, as it leads to a question upon which much has been written and little concluded. This enrichment is the series of panelling upon small piers, commonly called the intersecting arch. When once this ornament was used, the pointed arch was formed. Whoever also looks at a Norman groin, whether with or without ribs, must see an appearance of a pointed arch, and therefore I do not think it necessary to discuss the question of the introduction of the pointed arch here, as I know not that it can lead to any practical benefit.



AN ENGLISH DECORATED WINDOW.
Heckington Church, Lincolnshire.



AN ENGLISH DECORATED WINDOW.
Character of the Chapter House, York.

the little chapel at Kirkdale, in Yorkshire, into the ordinary Norman capital, and I suspect that this change was clearly developed about the year 1000, but this is one of the dates I cannot prove at present by documentary evidence.

The style which we designate as Norman is too well known to require much description. Evidently rude at first, it gradually softened its forms, multiplied its mouldings, and ultimately became in some examples almost gorgeous. The west front of Lincoln Cathedral is a fine example of the early and late Norman contrasted, the two side arches of the ancient front being evidently very early and the great west door very late.

Considering the Norman style as established, it is proper to notice how the plain square pier was altered.

1. It was made round with an enriched capital, sometimes of small projection and a round abacus or cap moulding, and sometimes with considerable projection and a square abacus. This pier we have in England of various heights—at Norwich

At whatever time this form was introduced, we find it curiously alternating with the semicircular one; they are often used together, and towards the end of the style and the beginning of the next we have Norman forms with Early English details, and Early English forms with Norman details, frequently occurring; and sometimes the forms and details are so mixed and jumbled as to make it very difficult to say to which style it belongs. But this is the great secret of the advance of architecture in England. It is so imperceptible in its progress that a series of examples of parts and ornaments and mouldings might be made out, each of them hardly differing from its predecessor, yet at every ten or twelve steps showing a decided alteration. It was by this gradual alteration that I conceive our beautiful Early English style was formed; this style, after struggling hard in the circular vestibule of the Temple Church, became in the eastern part a model of simplicity and beauty.

Then also appeared Bishop Poore's admirable edifice, Salisbury Cathedral, and that most valuable and numerous series of small churches which adorn almost every county in England.

It is well to notice that the churches of this date—viz. from about 1220 to 1300, or a little later—are remarkable not only for beauty and simplicity of design, but also for excellence of execution; seldom, indeed, is an Early English building seen without the best execution the material used is capable of.

How had this style been formed from the Norman?

1. The small window of the Norman style enlarged and with a pointed head became the simple but beautiful lancet window. The Norman double window, with a shaft between, became imitated in the double lancet, and afterwards in the double window with piercing between. As the Norman style had its more numerous assemblage of windows, so had the Early English. Each style its wheels; those of the former were small, those of the latter, much enlarged, became the magnificent transept windows of York and Lincoln.

2. The piers were altered principally by an alteration of their mouldings, but partly by a new and more elegant form. The round pier continued, the octagon pier also continued and increased in frequency in small buildings; but in larger ones the Norman square pier with shafts was changed into a bundle of shafts; four, eight, or sometimes more were used, and often a circular centre with four or more detached shafts set round it. These clusters of shafts were mostly united by the mouldings of the capitals, and part or the whole of the base mouldings, and sometimes by intermediate bands.

The deeply recessed arches of doors, &c., with shafts on the side, continued, but the shafts became of more importance, having sometimes in large doors a double tier of free shafts, one tier behind the other.

During this progress the mouldings were continually lightening and becoming more delicate, with intricate small hollows and small often repeated rounds, some plain and some filleted.

The rude and stiff Norman foliage and ornaments became more delicate and natural, and near the end of the style the sculpture of every kind was most exquisite. I need only instance the effigy of King John and those of some bishops in Worcester Cathedral, and that singularly elegant band of foliage in the side doorways of the choir screen of Lincoln. Amongst these enrichments we must not forget that simple ornament so profusely scattered in some of the best buildings of this style in England—the toothed ornament. All through the country is this enrichment seen, and it seems the regular gradation from the nail-head of the later Norman work to the square flower of the next style.

It is curious to remark that another peculiar characteristic of this style is a series of moulding for the bases of shafts, piers, &c., which is an imitation of the regular attic base of the Italians, consisting like that of two rounds and a hollow, with interposed fillets, but with this difference, that the Italian base is very rarely, if ever, worked so that it will hold water in the hollow, while the Early English base is almost always worked so that it will hold water, whether used within the building or in the open air, and its use is so general that wherever it and the toothed ornament are used together the style is most clearly made out.

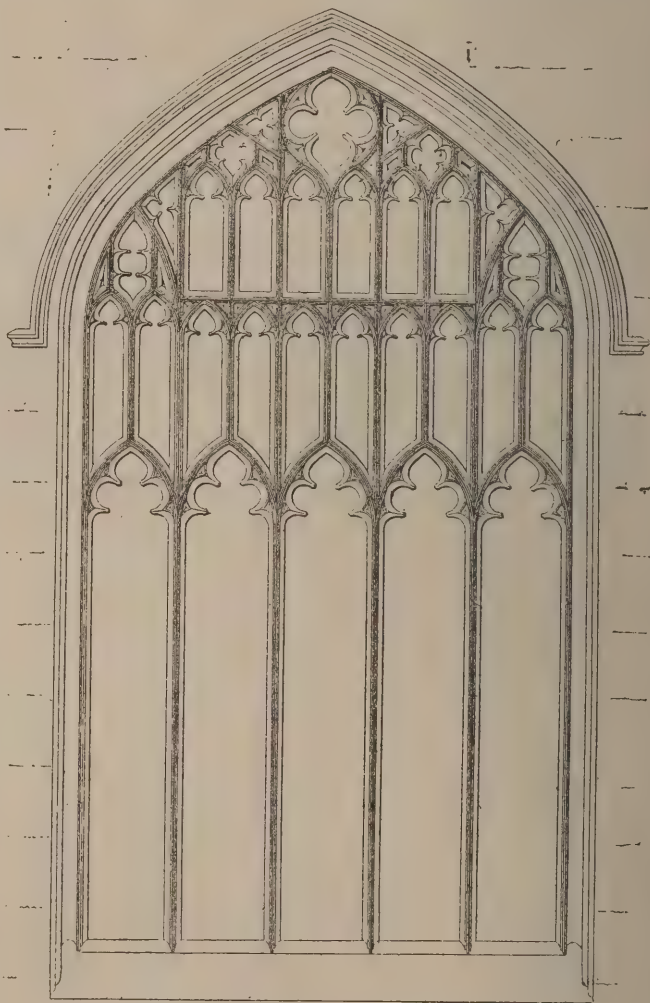
About, or in some places perhaps before, the year 1300 another gradual change in the windows had taken place; instead of two or three lancets divided by a portion of stonework the thickness of the wall, and therefore keeping these lancets and any piercings between their heads distinct windows, there now appeared windows divided by real mullions, and the whole window surrounded by another general moulding of the nature of an architrave. The heads of these windows were filled with geometrical figures, mostly circles, and a new species of ornament began to be used, at first sparingly, but afterwards generally, not only in windows but in panelling; this was the insertion of a number of smaller arches with points, producing cuspidation or feathering, and thus introducing a new and elegant ornament into every portion of architectural composition, and its gradual progress from the first sort of trefoil heads, where all the mouldings assume the shape, to its later character of a mere enrichment on one only of a series of mouldings, is very curious.

Thus gradual had been the preparation of that beautiful style, which a few years after 1300 appeared pretty much confirmed in England, the Decorated English style. As transitions from the last style to this, two buildings are so pre-eminent as to require notice: one, the ruins of St. Mary's Abbey, York, is well known; but the other, the remains of the church at Newstead Abbey, has been comparatively little noticed for its architectural character: they are both so elegant as to deserve the closest examination and study, that their character may be properly known and appreciated. Beautiful as these edifices are, there seemed yet a graceful point wanting: these transition windows, and many of the early Decorated works, have tracery which is mostly circles, trefoils and

other geometrical figures, giving a certain appearance of stiffness to the lines of otherwise very fine windows; this geometrical tracery, though perhaps never entirely given up, was soon followed by tracery in which the lines are beautifully flowing, and window tracery seemed to have received its final polish; and of course with window tracery was included all heads of panelling, heads of buttresses, and other analogous enrichment.

The windows in this style continued to be enlarged till at length five, six, seven and eight lights were not uncommon, and in one instance (the east window of the cathedral at Carlisle) nine lights were employed. This last window is not only remarkable for its breadth and large size, but its composition is quite equal, if not superior, to any window of the style. We have very few wheel windows of this style.

A further alteration of piers took place in this style: the octagon pier still continued to appear in small churches, and in a very few places a round pier may be met with, but the capitals and bases show the alteration in the date, and another alteration took place in larger churches. In the Norman square pier with shafts the square faces were to the nave, the aisles, and to the arches; in the Early English style the shafts



AN ENGLISH PERPENDICULAR WINDOW.
Eaton Socon Church, Bedfordshire.

were set in a circular direction in large clustered piers, and now in the Decorated style the pier again became angular; but the angles of the square were set where the Norman faces were, and thus the pier becomes of a lozenge shape, and of these piers the front angle shaft to the nave sometimes runs up and becomes a groining shaft in the roof. In the Early English style the shafts, whether of piers, doors or niches, were mostly detached. Stability being required as well as lightness, these shafts were worked in the Decorated style as parts of the series of mouldings, and not detached, thus adding much to the strength of the building; and this was the case not only with piers, but in the mouldings of doors, niches and other analogous situations. The foliated capitals and other enrichments became very elaborate but with increasing boldness, and while they will bear close examination, they have their full effect at a distance. The toothed ornament disappears with the Early English style; but in the latter part of that style and the earlier part of the Decorated a round flower with three or four leaves closed on a ball, and well known by the name of the ball flower, became common, and was used in great profusion in some places. At Warmington, Northamptonshire, it is used

in Early English work with the toothed ornament, and at Ledbury in good Decorated work by itself in great profusion.

The toothed ornament was succeeded by the square flower we have mentioned before, which is used of various sizes in various situations with great effect.

The Decorated style had the shortest reign, and its good examples are not so numerous, perhaps, as either of the other styles; but there still remains enough to form a very efficient study of this most valuable style, the most difficult truly to imitate and equally difficult to describe in words. Although allowing of the introduction of profuse enrichment, it is not dependent thereon for its beauty, for the harmony of its proportions is such that some of the plainest specimens are as satisfactory as the most enriched.

Of this style the naves of York and Exeter cathedrals are fine examples; but there is one unmixed and very little mutilated example, which deserves to be better known than it is—this is the church of Heckington in Lincolnshire, on the road from Sleaford to Boston, and in its vicinity are several other fine examples of the style, varying in date and character, but mixed in some instances with the earlier and later styles.

I consider Gothic architecture in England at this time, about the end of Edward III.'s reign, to have reached its best point. But there came another alteration, and this I conceive had its origin in practical arrangements, dependent on what seemed an increasing desire to have very large and lofty windows and openings.

In many places the obtaining stone proper for the heads and mullions of very large windows was, no doubt, in the then state of roads and other communications a matter of some difficulty, and towards the end of the reign of Edward III. the new style began, and decidedly by the year 1400 it was established. The great distinction of this style from the last is the perpendicular lines of the windows and panelling and the introduction of one or more transoms, with trefoiled or cinquefoiled heads to the lights at the transom. It is true that many domestic and castellated windows had before been worked with a transom, more often plain, but in a very few instances (of which the very long two-light windows of the hall of the Palace at Wells may be mentioned) with arches and featherings; but these transoms now became general, and also a system of reducing the heads of windows and other places requiring tracery into small panels and producing ornament by a repetition of similar small panels over all parts of the enriched surface.

A much more general use of perpendicular and horizontal lines, either crossing each other or stopped by each other as each in turn became principal, was adopted, and in many rich buildings the panels often became niches with ornamented canopies, sometimes pointed, sometimes square.

One of the earliest and best specimens of this style is the north window, door and niches of Westminster Hall; the peculiarities of the style, its multiplied small buttresses to the niches, its shafts with capitals and bases partly round and partly octagon, its light pierced projecting canopies to the niches, its style of foliage, and, in short, every distinctive feature, is fully brought forward in this early example, and it may be examined by, and compared with, a very late example, Henry VII.'s Chapel, which is its near neighbour. It is true both these examples have had parts restored, but I believe both so restored that they may be compared with propriety, and their dates being clearly known—one in Richard II.'s reign, the other in that of Henry VIII., the completeness of the style at first will, I think, be fully proved.

Again, we find an alteration in piers and arch mouldings, and indeed in the mouldings of the style generally, by the introduction of large hollows into the suites of mouldings. The round pier is very seldom, if ever, used; but the octagon pier is as frequent as heretofore, its base and capital being altered. The large pier is still lozenge form, and much resembles the pier of the last style, but in many instances is not a square lozenge, but flattened between the arches, becoming of greater dimensions north and south than east and west, and in many instances there are no capitals, but the mouldings run round the arch and are stopped by some of the base lines of the pier, and frequently having bases to the rounds, though they have no capitals.

Another feature of this style is the introduction of the four-centred or Tudor arch; this appears to me to be the result of the practical effort to give as much apparent height as possible, and also of the wish to groin parts of buildings much flatter than could be done with the ordinary arch of two centres.

Although after the year 1500 a degree of debasement and want of proportion every now and then is evinced, yet the style could not be said properly to be debased till the end of the reign of Henry VIII. But early in the reign of Elizabeth true Gothic was mostly gone; Italian mouldings and the Italian orders began to be first mixed and then predominant; all the ornaments of the windows were gone, and the large square plain transomed window, sometimes flat and sometimes projecting as an oriel, became nearly universal. In the reign of James I. the Italian orders were considerably used; but of

what sort they were the tower of the Schools at Oxford sufficiently may show. I have met with one porch of a church, dated 1636 and a portion of wood screen-work dated 1660, both of which are fairly designed and executed in the Gothic style; but they are solitary instances, and on the restoration of Charles II. in 1660, Gothic architecture seems almost to have been forgotten; for till within a few years, with very little exception, the attempts at restoration have been very barbarous.

Having thus very slightly sketched my ideas of the very gradual practical progress of architecture in England, I propose in my next paper to take the same rapid view of the architecture of that part of France which has been before me in my late tour, in order to enable me afterwards more minutely to compare and contrast the several styles, as they appear to have been worked at the same periods, in England and in France.

I am aware that in this paper I have left out many peculiarities and distinguishing features of the different styles; but I trust I have said enough distinctly to mark the styles when in their purity, and also their singularly gradual progress through both the advance and decline of Gothic architecture, though it must be acknowledged that the decline was much more rapid than the advance.—I remain, thine truly,

THOMAS RICKMAN.

(To be continued.)

THE PRESTON TECHNICAL SCHOOL COMPETITION.

THE following correspondence has been sent to us for publication:—

To the Council of the Harris Institute, Preston.

22 Guildhall Street, Preston: May 2, 1894.

Gentlemen,—We, the undersigned, unsuccessful competing architects for the erection of the Harris Technical School, desire to draw the attention of the Harris Institute Council to the following points in connection with the competition, which appear to us, on the face of them, to constitute a breach of the terms under which we entered into the competition.

It would appear:—1. That the first clause of the instructions lays down "That the amount for shell of building from bottom of footings upwards, including supply of gas, water and low-pressure heating apparatus throughout the building, painting, finishing and architect's commission, must not exceed 8,500*l*." 2. That the Council have selected, and are about to carry out, a design which is to cost 13,000*l*. 3. That the costliness of the design—according to the statement of a member of the Council, Mr. Healey—has been cut down to come within this 13,000*l*.

We would desire to point out that under these circumstances those competitors whose designs were in accordance with the limit of cost laid down are thus placed in an unfair position by the acceptance of a design which, by the first clause of the instructions, ought to have been disqualified.

Having regard, therefore, to our rights as competitors, and with a view to ascertaining our position, we would respectfully request that the Council should satisfy us on the following points:—1. Whether the selected design is proposed to be carried out. 2. Whether the contract plans are in conformity with the designs as selected, or otherwise. 3. Whether the contract plans include any greater extent of building than the 8,500*l*. was stipulated to provide for, including architect's commission, and whether they include "supply of gas, water, low-pressure heating apparatus throughout the building, painting and finishing."—We are, gentlemen, respectfully yours,

JOSEPH V. HIBBERT (Preston).

G. SEDGER (London).

GARLICK & SYKES (Preston).

STONES & GRADWELL (Blackburn).

Harris Institute, Preston: May 9, 1894.

Dear Sir,—Your letter of the 2nd inst., addressed to the Council of the Harris Institute, signed by yourself and the other architects, was laid before the Council at their meeting to-day. The Council are unwilling to enter into any controversy upon the subject of the competitive plans for the new technical school. The plans were reported upon by a competent and independent assessor, and the selected plan was chosen by the building committee, and their choice was confirmed by the Council after a full consideration of his report. The Council consider that they have fairly and properly selected the best and most suitable plan, and that no competitor has any reason for complaint.

Will you please communicate this reply to the other gentlemen who have signed the letter.—I am, yours truly,

THOS. R. JOLLY, Secretary.

Mr. J. V. Hibbert, Guildhall Street.

VICTORIAN INSTITUTE OF ARCHITECTS.

AT the opening of the annual session of the Victorian Institute of Architects, Melbourne, Mr. A. E. Johnson gave an address. He stated that, having lately had an opportunity of travelling through Italy and many of the great centres of art, he was convinced that modern architects were worthily maintaining the traditions of the past, although in Australia they were hampered by want of access to the great art monuments which had inspired old-world architecture. The inferiority in our standard as compared with that of the old world was, he thought, due largely to the want of more thorough training in both the technical and artistic branches. The curriculum of the R.I.B.A. gave some idea of what the young architect had to go through in England before being "hall-marked." What was there done by paid specialists had to be done here by the senior members of the profession in their spare time. He understood that it was possible to secure at a small cost photographs of the splendid architectural collection brought together in the London Museums by the late Sir Gilbert Scott. There was, he feared, too great a tendency on the part of young architects to rush into business for themselves. The long training to which the continental architect had to devote himself before taking such a position even as that corresponding with clerk of works was in marked contrast to our practice, which it was to be feared very often brought the profession into contempt. A valuable contribution to this phase of the subject was a lecture recently given by Professor T. Roger Smith to the students of the London University, but particularly to those at the bottom rung of the ladder. The Professor took the ground that no natural gift could compensate for a lack of training in a great many of the essentials of the profession. As a proof of the desirability of adopting such methods of architectural culture as had been found successful at home, he would point to the great improvement noticeable in the architecture of the old country during the last thirty or forty years, and which could be gauged from the drawings of architectural subjects displayed in the London Royal Academy exhibitions, most of which displayed originality, good composition and beauty of detail in addition to splendid drawing. During a recent visit he was much struck with the improvement in London street architecture, especially in the dwelling-houses of such new squares as Kensington and Brompton, in suburban and country villas, and the many beautiful churches, all of which a like training would, he believed, alone enable us to emulate.



Gigantic Architecture.

SIR,—In the report of the Royal Academy banquet the Premier tells us in amusing language of his recent railway journey, and the inartistic objects of the earth, the sea and the heavens that came before his eyes as in a panorama, and I am afraid that the professional part of his audience felt little comfort or encouragement from the picture presented to them. Whether the architects who were there will feel bound to take warning by what was seen in the heavens at Wembley—a great, high tower built like that of Babylon, to a certain height and then deserted by its builders on finding that they spoke different languages—may be left with perfect equanimity to their good judgment when they are in the privacy of their studios. For myself the speech was suggestive of some practical considerations in architecture. We want an architecture up to date. London, with her immense population wanting larger and better and more sanitary habitations, is very probably on the eve of being incorporated by the London County Council, and her vast wealth will, in that event, be more justly apportioned for the general good. The little square mile of narrow lanes and tortuous passages and dark, overcrowded tenements will probably be, in time, unknown to their present pale and sickly inhabitants, having been intersected by noble avenues, with ample light and air—the birthright of every subject of the Queen. The science of the age is quite capable of dealing with this problem. The men who can take railway trains under the river Thames in perfect safety, who can build a Forth Bridge, standing firmly while the Tay Bridge was blown on a dark night into the river below, who can raise bodily an Egyptian temple thousands of tons weight and construct a reservoir where once it stood, and then plant the temple on a new foundation, we may be sure are the men to bring light into dark places, given the one thing needful—money. The provision of this, I suspect, is largely a part of the idea and purpose of the unification of London and of its complement—betterment, by which all will benefit, the rich

landlord, whose rents will not be less, though they may come from a smaller area in the present square mile, and the poor lodger in slums, who will find himself living in a new municipal palace.

Work like this is what the vast City estates—vast by increased value from the lapse of time rather than larger area—are, I think, wanted for, and depend upon it, sir, it has to be satisfied. Three powers combined will be all that is necessary—Parliament, the London County Council and the Ecclesiastical Commissioners. I forget, there is a fourth—the architects, those at least who have trained themselves by looking forward instead of, like mere archæologists, looking ever backwards, and are, consequently, incapable of originality.

Well, when, say in 1900 A.D., the little square mile has given up sufficient of its area for ample thoroughfares, the new municipal buildings will show their qualities. "New lamps for old," light and air will be secured by piers half the area and double the strength of those at present customary, by girders of double the present bearings, a general construction in storeys, double the present number, every or every other storey set back about 10 feet, so as to do away with the present gloomy character of the buildings of the City, and enable sky-lights to be obtained where required. This would be an improved method of meeting the clause in the Act that limits the height of buildings in proportion to the width of the street in which it stands, while the area and rents gained by the extra storeys will repay, or largely repay, the money spent on the improved thoroughfares and open spaces. Iron, steel, glass and terra-cotta will largely supplant the old brick and stone in this new municipal architecture—this architecture up to date.—Yours truly,

HERMES.

GENERAL.

Victoria Park, Macclesfield, the gift of Mr. F. D. Brocklehurst, J.P., Harehill, has just been opened. The grounds are very extensive and charmingly situated. The gift represents about 10,000*l.*, and some hundreds have been expended in laying out the park.

The Prince of Wales on Saturday last inaugurated the summer and autumn season of the Imperial Institute, by formally opening the exhibition of artistic and decorative pottery and china and glass which has been organised by the executive council.

A Hampshire Landscape, The Firs, painted by Mr. David Murray, A.R.A., has recently been acquired by the Glasgow Corporation for the art gallery.

Blackfriars Bridge was partially closed for repaving on Wednesday, space having been left for two lines of traffic while the work is being carried out.

The German Emperor has promised to contribute 500*l.* annually for some years to come, for the building of a state theatre at Bromberg.

A Portrait painted by Mr. Joseph Henderson, R.S.W., of ex-Lord Provost Sir John Muir, Bart., has just been hung in the Glasgow Corporation Art Gallery.

Mr. J. Donovan Adam, R.S.A., of Edinburgh, lately sent to the Salon des Champ Elysées a painting entitled *Before the Setting of the Sun*, which the French Minister of Fine Arts has, on behalf of the State, decided to purchase.

The Outdoor Sketching Season of the Dublin Sketching Club for 1894 has just been inaugurated, when the members of the club met at Dalkey on their first excursion. The president, Mr. John L. Robinson, R.H.A., M.R.I.A., hospitably entertained the members and friends at his residence, Rathruadh, Glengary.

The Members of the Lancashire and Cheshire branch of the Incorporated Association of Municipal and County Engineers and Surveyors have just paid a visit to Chester. A paper on "Steam Road-rolling" was read by Mr. Allan Greenwell, surveyor to the Frome rural sanitary and highway authority; and Mr. Albert Wollheim, C.E., read a paper on "The Eaton and Eccleston Sewage Precipitation Works."

It is stated that what is probably the largest piece of cut glass ever made in America is at present on exhibition in New York city. It weighed 70 lbs. before it was decorated, and lost about 20 lbs. in the cutting.

A New Organ, presented to the Dean and Chapter of Peterborough Cathedral, has been dedicated. The organ cost 4,400*l.*, the builders being Messrs. Hill & Son. A considerable number of stops which formed part of the old organ, built early in the century by Aller, of London, have been incorporated in the new instrument.

During a Thunderstorm at Ashby-de-la-Zouch one of the pinnacles of the square tower of the parish church was struck by lightning and several feet of the carved stonework demolished. The current also tore up a portion of the plaster and brickwork forming the roof of the tower.

The Architect.

THE WEEK.

THE defeat of the French Ministry, we suppose, means the loss of office by M. SPULLER, the Minister of Fine Arts. It was only on Friday last he was present at the opening meeting of the congress got up by the Union Centrale des Arts Décoratifs, in order to consider what measures were best adapted to promote the development of industrial art in France. M. SPULLER delivered such an address on the relation between art and industry as every French deputy is able to supply at a moment's notice. In conclusion he told the Council of the Union that if they ever were in want of money they were not to hesitate about asking him for it. This of course raised expectations of a liberality which was novel to the Union, for it is kept up by lotteries and donations; but M. SPULLER added, "It is probable that I shall not give you any money, but your visit may be an announcement to my successor, who may be better able to supply you." At the time the Minister could not have anticipated the approaching collapse. The Union has not succeeded in establishing a museum in Paris, but it is considered that something might be done if the provincial societies would be more loyal in their co-operation.

THE fourteenth congress of the Sanitary Institute will be held in Liverpool from September 24 to 29. Three general addresses and lectures will be delivered. Sectional meetings, dealing with (1) sanitary science and preventive medicine, (2) engineering and architecture, (3) chemistry, meteorology and geology, will be presided over by Dr. E. KLEIN, M.D., F.R.S., Mr. G. F. DEACON, C.E., and Dr. THOMAS STEVENSON, M.D., F.R.C.P. Special conferences on the sanitation of the passenger and mercantile marine service, on medical officers of health, municipal and county engineers, sanitary inspectors, and domestic hygiene will also be held. In connection with the congress, an exhibition of sanitary apparatus and appliances and articles of domestic use and economy will be held in the Drill Hall, Upper Warwick Street. Excursions to places of interest in connection with sanitation will be arranged for members attending the congress. The local arrangements are in the hands of an influential local committee, presided over by the Lord Mayor of Liverpool, with Mr. H. PERCY BOULNOIS, the city engineer, and Dr. E. W. HOPE, M.D., medical officer of health, as honorary secretaries. Over one hundred sanitary authorities, including several County Councils, have already appointed delegates to the congress, and as there are 1,500 members and associates in the Institute, there will probably be a large attendance this year.

SOME remarkable churches were visited by the members of the Clifton Antiquarian Club during their excursion in Monmouthshire last week. One was at Matherne, and marks the burial-place of St. TEWDRIC, the hermit king of Glamorgan, who was slain in a battle against the Pagan Saxons in the sixth century. The church consists of a massive western tower, with nave, north and south aisles, south porch and a long chancel. Originally it was an early thirteenth-century building, to which period the arcades of four bays still belong, as well as the chancel, though later interpolations have been since inserted. The tower and aisles were rebuilt in the fifteenth century. FRANCIS GODWIN, who was bishop of Llandaff from 1601 to 1617, gives the following account of the Welsh king, who was revered as a martyr:—"The manor of Mathern, where there is now a palace, was given to the bishops of Llandaff by MAURICE, king of Glamorgan, about the year 560, on the following occasion. His father, St. THEODRIC, as he is usually called, having resigned his crown to his son, embraced the life of a hermit. The Saxons, invading the country, THEODRIC was reluctantly called from his hermitage

to take the command of the army. He defeated them near Tintern, upon the Wye. Being mortally wounded in the engagement, he precipitated his return that he might die among his friends, and desired his son to erect a church and bury him on the spot where he breathed his last. He had scarcely proceeded five miles when he expired, at a place near the conflux of the Wye and the Severn; hence, according to his desire, a small chapel being erected, his body was placed in a stone coffin. As I was giving orders to repair this coffin, which was either broken by chance, or decayed by age, I discovered his bones, not in the smallest degree changed, though after a period of a thousand years, the skull retaining the aperture of a large wound, which appeared as if it had been recently inflicted. MAURICE gave the contiguous estate to the Church, and assigned to the place the name of Merthyr Tewdric, or the Martyrdom of THEODORICK, who, because he perished in battle against the enemies of the Christian name, is esteemed a martyr." The bishops of Llandaff resided at Matherne from 1408 to 1706. The palace was commenced by JOHN DE LA ZOUCH, A.D. 1408, and was completed by MILES SALLEY, A.D. 1504. The stone coffin mentioned by Dr. GODWIN was again revealed during the restoration of the chancel in 1881.

THE sculptured panels for St. George's Hall, Liverpool, have been completed and fixed by Mr. STIRLING LEE. The commission was given to the sculptor by the Corporation. When two of the panels were placed in position an outcry was raised about their unsuitability, and an effort was made to escape from the responsibility for the remaining four. Mr. Alderman RATHBONE, who manfully upheld the cause of the artist, then offered to have the series completed, but stipulated that the panels were not to be disturbed for at least two years after they had been erected. Time has had a sobering effect on the opposition, and the new panels are not likely to be subjected to the sort of criticism which their predecessors had to sustain. The following are the subjects of the series:—1. Joy follows the growth of Justice, led by Conscience, directed by Wisdom. 2. Justice, in her purity, refuses to be diverted from the straight path by Wealth or Fame. 3. Justice, having attained maturity, upholds the World, supported by Knowledge and Right. 4. Justice, able to stand alone, administers by the sword. 5. Justice is relieved of her sword by Virtue, and of her scales by Concord. 6. Justice receives the kiss of Righteousness and the crown of Immortality. It will be seen that the panels relate to the use of St. George's Hall as a Court of Justice. The date for unveiling them has yet to be arranged.

OF late years exhibitors have not derived much profit out of international exhibitions. In the future they must not expect compensation for the past. The Royal Commissioners of the Chicago Exhibition suggest that unwelcome circumstance when they announce that individual exhibitors must subordinate themselves for the sake of producing general effect. In other words, exhibitions are to become contests between nations, and exhibitors are to consider themselves as mere rank and file that must expect to be sacrificed, and if they survive have little chance of glory or other reward. If they are not willing to sink their individuality or fight in masses, "they must be content to see public attention attracted by the better organisation of their rivals." It is objected that at Chicago the general effect produced by the British section was not equal to some others. The report does not, however, indicate in any way whether foreigners who made sacrifices for their own and their country's good derived benefit from the Chicago Exhibition. As far as we can judge, the only gainers were the Americans. They were able to realise what was most desired in Europe without the trouble of crossing the Atlantic, and they have since taken advantage of the information by entering into competition with the producers of the finest classes of goods in continental cities. To an economist it is gratifying to see the New World fighting the Old World, but a plain man will think it hard that the latter should be compelled to instruct rivals in commercial strategy without receiving any payment for the lessons.

DANTE GABRIEL ROSSETTI.*

THE memoir of DANTE ROSSETTI is described as "one of the tributes of an old friend," for Mr. STEPHENS has often served as an interpreter between his brother pre-Raphaelites and the public. It is needless to say that he possesses the qualifications for a service of that nature. He was associated with the painter during eventful years, and aided in developing his theory of art, and afterwards, as a writer on art, Mr. STEPHENS was acquainted with the history of all ROSSETTI's pictures, a subject that has its obscurities. This dual relation is exhibited in the memoir. Mr. STEPHENS writes as an old friend, but while offering his tribute, he does not wish it to be interpreted as evidence of his belief that ROSSETTI was the greatest of modern painters. Indeed, he admits that a man who was less munificently endowed with gifts by nature would have been more successful as an artist, or, to use his own words, "While I wonder at his achievements, and know how great were the powers he employed, I cannot help thinking that a less complex nature would have done still more than, so far as time and space allow, these pages have to report of and illustrate." The lines suggest one of the characteristics of the book. Mr. STEPHENS shows the progress of a great genius in overcoming obstacles, but he also reveals in the kindest manner how some of the most perplexing were not external. ROSSETTI would not object to that sort of presentation. He was too shrewd a man—too fond of analysing the motive-powers of life—to suppose that he was always a heroic painter. When he wrote to one of his supporters about his difficulty in completing a commission, and might have little to show, he said, "It may be otherwise, however; there is no knowing in such a lottery as painting, where all things have a chance against one—weather, stomach, temper, model, paint, patience, self-esteem, self-abhorrence, and the Devil into the bargain," he was confessing that he was only a fallible genius after all.

DANTE ROSSETTI was a child of his time, and he could not be free from its weaknesses. He was born in 1828. His father belonged to Vasto d'Ammonio, in the Abruzzi, and was an official in the Naples Museum when one of the periodical revolutions broke out. To escape the royal vengeance he fled, and in 1825 he found a refuge in London. He became a teacher, and in 1831 obtained the professorship of Italian in King's College. Excellent as is that institution, it insists on the orthodoxy of its humblest officials, and ROSSETTI could not have been accepted to explain the rules of grammar unless he had made a sacrifice of his early belief. A man who goes through that sort of reform generally strives to become over-convincing of himself and others, and Mr. STEPHENS suggests a good deal when he says the Professor "looked like an old and somewhat imperative prophet, and his voice had a slightly rigorous ring in speaking to his sons and their visitors." Poor DANTE is described as on that occasion "leaning his elbows upon the table and holding his face between both hands, so that the long curling masses of his dark brown hair fell forward, his attenuated features sharply outlined by the candle's light." He received his first teaching from his mother, "an accomplished and devoted matron, whose affection was, even to his latest days, ceaselessly acknowledged by her son." Then he went to a private school, and afterwards to King's College.

In 1843 he began to draw, and apparently as soon as he could use a pencil he attempted the illustration of his own stories. He joined CARYS Academy, and by 1846 he was sufficiently accomplished to be received as a student of the Academy. A reputation for poetry and sketching chivalric and satiric subjects had preceded him. He was not made of the ductile stuff which is satisfactory to Visitors. Revolution was in the air, and affected art as well as politics. PUGIN had with all his energy exposed the shams of architecture; CARLYLE had warned the world of its doom because of its inaccuracy; the very ballad-singers in the streets were announcing that a good time was coming. The competition of the cartoons for the frescoes of the Houses of Parliament had brought novel and stereotyped treatment into opposition. Among all the attempts the

strangest was MADOX BROWN's, and when he by a few later works demonstrated that he was not strange by accident, but through conviction, young ROSSETTI, who had attained the ripe age of twenty, offered to become his disciple, but in such glowing terms of admiration that BROWN imagined they were only a new form of the sarcasm to which he was accustomed, and sought his votary in order to cudgel him. But he was moved by the lad's genuine faith, and immediately offered to become his teacher and without fees. The first exercises were a severe test to one who could write and illustrate his own poetry. It appears ROSSETTI was set to copy pickle-jars and other inspiring examples of still life. Earnest as was MADOX BROWN, he was not, perhaps, the most suitable hand to give bias to ROSSETTI's instincts, but fortunately there was another influence. Mr. STEPHENS, with his competency to decide on this subject, says:—"There can be no doubt whatever that to BROWN's guidance and example we owe the better part of ROSSETTI as a painter *per se*, although his will to study with tenacity, and thus command success, might have been stiffened by the encouragement and example of Mr. HOLMAN HUNT, apart from which I fear the latter-named student was not the fittest guide for a genius like ROSSETTI, who very soon departed from the uncompromising principles of the indomitable friend who had never been, even for an hour, his model on art. Rather had the brilliant and happy power of MILLAIS, one of the finest painters of the age, and a born artist, been as light before the subject of these pages."

In 1848 ROSSETTI became co-tenant with Mr. HOLMAN HUNT of a "large gaunt chamber" in Cleveland Street, Fitzroy Square. Before the year was over the two young artists had united with J. E. MILLAIS, T. WOOLNER, J. COLLINSON, F. G. STEPHENS and W. M. ROSSETTI in forming a League of Sincerity. To them may be joined W. H. DEVERELL, although he was not formally elected. According to Mr. HOLMAN HUNT, the inspiration for the League was derived from engravings after the frescoes in the Pisan Campo Santo. Mr. STEPHENS says:—"There was no intention of following, much less copying, the modes and moods of the artists who preceded RAPHAEL, nor of repeating anything which had been attained in art's service since the days of that Prince of Painters. Each friend was to work in his own way, and if an edifying use could be made of the subject, so much the better, yet nothing like a didactic, religious or moral purpose was insisted on by any brother." In about a year the aims of the League were widened, and it was resolved to elevate literature by establishing a publication called the *Germ*. Only four numbers appeared. Copies are coveted by collectors, but we are afraid it is not from admiration for the essays or poems.

About the sincerity of the members there could be no question. The League bore no correspondence to modern literary and artistic "rings," that are organised mainly to attain commercial success by efforts which are supposed to be disinterested. Few could understand what the Brotherhood were trying to do, but everybody was at least convinced that the young artists had resolved to demonstrate that the taste of the public in England was towards unworthy objects. People were not likely to be gratified by the discovery. In their turn they mocked the reformers, and of course did not appreciate the works of the League. ROSSETTI was fortunately able to sell his first picture, *The Girlhood of Mary, Virgin*, for 80*l.* to a lady, but for the *Ecce Ancilla Domini*, an exquisite and original interpretation of the Annunciation, he asked 20*l.* less, and although it was exhibited there was no purchaser attracted. It remained with the artist for three years, and then it was bought by a man who had not seen it, but was of a speculative turn. In 1886 the picture was purchased for the National Gallery at 840*l.*, or fourteen times the original price.

The two pictures merit to be accepted as thoroughly representative of ROSSETTI's style. By practice his technique was improved, and he gained the power of more clearly expressing his thought, but his idea of art appears to us as marked in the two pictures, and especially in the second, *The Annunciation*, as in any of his more matured works. That idea, which he held in common with the other pre-Raphaelites, was the expression of complex emotions. "There is no art," says SHAKESPEARE,

* *The Portfolio Monographs on Artistic Subjects: Dante Gabriel Rossetti*. By F. G. Stephens. London: Seeley & Co., Limited.

"to find the mind's construction in the face," and a great many English painters have accepted the words as authoritative. The Greeks also seemed to have believed in a similar principle. The pre-Raphaelites, on the contrary, considered the face was a revealer of emotions. In their eagerness to be sincere, they sometimes went to lengths which the discipline of good manners or self-respect would not tolerate in the men and women who were depicted. It is only necessary to glance at some of the pictures which are now in the Guildhall Gallery for evidence of this fact. As a consequence of its being less expressive, the figure was often carelessly modelled, or posed in a way that was a defiance of anatomical restrictions. ROSSETTI, in course of time, showed a preference for heads alone, or for busts and half-lengths at the most. So accustomed are admirers to his ways, we doubt if any of them will observe at first sight any deficiency in the reproduction of the unfinished *Our Lady of Pity*, which occupies one of Mr. STEPHENS's pages. As the head and hands are nearly completed, it seems of little consequence that the figure is indicated most indefinitely.

As faces, and especially those of women, were of so much importance in ROSSETTI's eyes, it is no wonder when he discovered one that corresponded with his desires, or to which his desires could be accommodated, he made many repetitions of it. We might go so far as to say that the works of ROSSETTI could be most clearly classified according to the faces by which he was captivated from time to time rather than by dates or subjects. The faces did not always correspond with the ordinary standard of what was beautiful. ROSSETTI, as in his *Lilith*, could produce a head and bust which would bear to be hung in a gallery with a copy of the *Venus of Melos*, and which everybody could appreciate. What he preferred, however, was something that would be thought mysterious, like DA VINCI's *Mona Lisa*. The two artists believed they alone understood what the French call the Eternal Feminine. DA VINCI, we suppose, imagined there was "une passion sérieuse, noble, éternelle," as CONSTANTIN says, operating somewhere behind the eyes of LISA DEL GIOCONDO, when probably she was speculating whether all the time the painter was spending over the portrait was to be charged, and at what rate. When ROSSETTI imagined his model was looking before and after simultaneously—or, as he expressed it, "the shadowed eyes remember and foresee"—she may have been thinking about somebody's new bonnet, or whether her cloak was likely to suffer permanently from the last shower. The mysterious beings he painted were not always remarkably intellectual, or apprehensive of "the awful shadow of some unseen power." It must be allowed, however, that ROSSETTI's heads are impressive and not easily forgotten. A collection of them may be disappointing or painful, but that might be said of several of DA VINCI's smiling half-figures, like the *Mona Lisa* or the *Baptist*, if they existed and could be brought together in a gallery.

In compositions where several figures were introduced ROSSETTI was not always successful. He seemed to care little about subordination, and as all the figures appear to have equal importance, which in an ethical sense may have been right, the incident illustrated does not become manifest. It was for that reason, we suppose, he was rarely employed by architects. His mysticism and the unworldly character of so many of his figures qualified him for church decoration; but works which constantly stand in need of an interpreter are not adapted for town or country congregations. He was more fortunate in his designs for stained-glass. On that subject Mr. STEPHENS writes as follows:—

From the first he mastered the facts that, unlike pictures proper, which are seen by reflected light, paintings on glass, being transparent, are seen by transmitted light, and do not permit the use of modelling in light and shade, intended to give a false appearance of relief to that which ought to be of the nature of a mosaic in transparent media, with shadows, not modelled to anything like naturalistic or imitative results. Knowledge of this principle lies at the root of design in this application, and yet so dense was the ignorance of art then prevailing among antiquaries and *cognoscenti* that Mr. C. Winston, a great authority on the history of glass-painting, and a first-rate copyist of ancient windows, refused to accept this rudimentary canon of the subject, and sanctioned those illogical and inartistic transparencies which, vilely designed and childishly-executed in the picture glass-works at Munich, offend the eyes of critics in St. Paul's and Glasgow Cathedrals. Greatly to Rossetti's influence, though not perhaps to his

initiative (about which I am not certain), is due the successful and brilliant revival of art in glass, which has flourished chiefly by means of Messrs. F. M. Brown, W. Morris, Sir E. Burne-Jones, and a few other competent artists and manufacturers, by which the whole art and practice of *vitræx* have been revolutionised.

ROSSETTI's colour sense was exemplified in other productions besides stained-glass and pictures. It was exemplified also in his poetry. As Mr. STEPHENS says, "These poems, and especially the sonnets, are the outcome of a genius essentially pictorial, that is to say, a mind which saw everything, from the rose and ivory of a woman's carnations to the sullen splendour of a sunset, with the eyes of a painter revelling in colour, enraptured by the grace of a perfect curve, and capable of exquisite and sympathetic research when human pathetic expression was in view." So much versatility or power to treat various forms of art as if they were all one to a man who had the insight to perceive their relations, is Italian. The qualities of the race were no less manifest in ROSSETTI's skill in affairs with which mysticism and romance might seem to have no connection. Mr. STEPHENS refers to the artist's "business capacity, in which, as a bargain maker, cash receiver and negotiator in general, he, to the wonder of his artistic and poetry-loving friends, shone greatly. Of his powers in these respects, bankers, lawyers, merchants and everybody whose wisdom in cash and commerce was unchallengeable, spoke with unreserved admiration, not to say surprise."

It is not often so remarkable a combination of talents is found in any country or time. ROSSETTI was phenomenal, and it is an advantage that so careful and accurate an account of his life and works has been brought within the reach of the humblest students of art.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual general meeting of the Edinburgh Architectural Association was held in the Royal Institution, Princes Street, on the 16th inst., Mr. W. W. Robertson presiding. The treasurer's statement showed a deficiency of 42*l.* 4*s.* 5*d.* at the close of the session, caused, it was explained, by an increase in the expenditure, the income being practically the same as last year. Mr. W. W. Robertson was elected president for the ensuing year, Dr. Rowand Anderson and Mr. Thomas Ross vice-presidents, and Mr. T. Fairbairn secretary.

The President, in his address, discussed one or two subjects of interest to the Association and the city. He recalled the deputation to the Edinburgh Town Council, to urge upon that body that the best architectural skill available should be conjoined with that of the engineer who might be invited to design the new North Bridge, and that in respect of the buildings at the north end of the bridge which the railway company propose to rebuild, the existing restrictions as to height should be maintained entire and undiminished. From their reception by the Council, and from what was said at the time and shortly afterwards, they fondly hoped that they had so impressed the members with their views as to go far to secure their adoption. What might be the action of the Council as to the designing of a new bridge they did not yet know; but as to the Council's action on the other point, he confessed to a feeling of disappointment. The present height of the higher portions of those buildings was about 55 feet, and the railway company proposed to take power to go 95 feet above the street to the ceiling of the highest inhabited storey. What the city had agreed to was a clause providing that the height should not exceed 80 feet to the wall-head without the consent of the Corporation. Now the difference between 80 feet to the wall-head with a storey above in a mansard roof, and 95 feet to the ceiling of the highest inhabited storey was very much the difference between Tweedledum and Tweedledee, and the concession secured by the town, which seemed little enough at first sight, was found on examination to be nearly altogether illusory. The building would still be raised about 50 feet, and would still overtop and most prejudicially affect everything in its vicinity. From Sir Walter Scott's Monument and Princes Street to the west it would wipe out a great part of the view of the Calton Hill. Viewed from the Calton Hill in the vicinity of the Nelson Monument, whence one of the finest views of Edinburgh was obtained, the effect of such a building would be simply disastrous. It would block the view from the Castle Hill on the left to the Scott Monument on the right, and shut out the view of the valley as completely as if a huge shutter were drawn up. It was not merely the loss of the view of the valley, with its deep hollow and refreshing greenery contrasting so beautifully with the buildings of the old and new town on either side, that they should have to lament. The building would shut out of view the whole vertical portion of the outlin

of the Castle rock, and thus not only destroy entirely its characteristic appearance, but deprive it of half its apparent height. From nearer points of view—from the south looking down the North Bridge, and viewing it as part of the group surrounding the register office crossing, the effect was equally disastrous. He gathered from the *Scotsman* columns that one town councillor gave it as his opinion that the committee of the House of Lords would not be likely to interfere with the Bill because the building would shut off the view of Princes Street Gardens which a few people might have from the Calton Hill. There must have been some subtle humour in the manner of the remark, because it was received with laughter, which, as far as his judgment went, could hardly be provoked by the matter of it. It hardly needed to be pointed out that the same wise remark might be made of any one of these features of loveliness which, taken together, constituted the priceless dower of beauty with which nature more than art had endowed their beloved city, and which made her "beautiful for situation, the joy of the whole earth." Surely the beauty of Edinburgh was beyond price; and if her sons had that deep appreciation and affection for her which they ought, they would value those who tenderly sought to preserve it, and would say from their hearts, "Let them prosper that love thee." On the other hand, he doubted not that a second Scott would arise to pour "a minstrel's malison" on "the dull destroyer's head" who bartered this birthright for a mess of pottage, and celebrated the bargain with a jest. For the actual action of the Town Council he could find many excuses. In their complex negotiations with the railway company they had to give and take, and it was a misfortune from their point of view that although doubtless they would have preferred to insist on this building being kept low, there were other points to which they attached greater importance, and to secure these they gave the point away. The Bill had still to pass the House of Commons, and they would fain hope against hope that some amendment might be made there. But there was little hope of this. The natural guardians of the amenity of the town had said their last word, and entered into a treaty with its assailants. The public showed no sign of interest. The public never did realise the effect of a change such as this till it was made and beyond repair. Then there would be a torrent of letters in the newspapers, as they continually saw about much smaller matters, if the papers would print them. A singular contrast to the apathy of the public on what they might call the larger questions of amenity was the feverish outburst of correspondence on the great question of projecting signs. Not that the subject was without its interest. In the olden time, before the simple expedient of numbering the houses in a street had been adopted, the only way for one particular place to assert its individuality and make it easy for travellers, messengers and others to identify it was to adopt some visible sign, which constituted part of its address, and was used both in dating and directing correspondence. How largely this practice had entered into and given local colour to literature, from the days when Chaucer's pilgrims gathered at the sign of the Tabard, or these latter days when Ben Jonson and his compeers assembled at the Mermaid, down to the writings of Scott, Dickens and Thackeray, they need not say. In busy places where competition ran high great efforts were made to excel in this matter of signs, and they grew in size and importance, and the greatest ingenuity was displayed in devising something new and striking. At last the evils connected with this became so serious that in 1762 an Act of Parliament ordered them all to be removed, or if retained to be placed against the fronts of the houses. It seemed there had been a considerable increase in the number of such signs in the city, and the city fathers had resolved to put in force the powers which they had had for the last fifteen years, and had ordered a wholesale removal. The powers of the Act, he contended, however, were so excessive they never could be intended to be exercised.

On the motion of Mr. James Bruce, W.S., seconded by Mr. Thomas Bonar, a vote of thanks was awarded to the President.

On Saturday the members of the Association visited the old castle of Dalzell, the seat of Lord Hamilton. The castle is situated in a romantic situation on the steep bank of a brawling stream, which runs in a deep and rocky gorge, winding its way round the east and south sides of the old building. In ancient times the other two sides were defended by curtain walls and a moat. The situation of the castle was doubtless selected because of the security its position afforded, and not from the charming nature of the scenery which captivated the eye of William Cobbett, who visited Dalzell in 1832. Describing the venerable and massive castle, and the wild rocky glen from which it rises, contrasted with the majestic flow of the Clyde, which runs near by, he says it is the place at which, if he were compelled to reside in Scotland, he would choose to live. The original keep is a characteristic example of its kind, and is still entire, and forms a most charming part of the house. It probably dates from the fifteenth century, and was doubtless built by Dalzell of that ilk, a family in whose possession the barony had been for several

generations till 1647, when it was acquired by James Hamilton of Boggs, ancestor of the present proprietor. He made extensive additions to the castle, and his arms and those of his wife, Jean Henderson (of the Fordell family), are still to be seen on the house, with the date 1649. The present Lord Hamilton greatly added to the structure about 1847. The late Mr. Billings, the author of the well-known book "The Baronial Antiquities of Scotland," was the architect employed. Mr. Billings resided at Dalzell during the time the work was in progress, and a great deal of the rich carving and the elaborate plaster ceilings was wrought with his own hands. The party next walked to Jerviston House, about a mile distant from Dalzell. This is an ancient seat of the Baillie family, and overlooks the Clyde not far from Motherwell. It is probably a house of the end of the sixteenth century, and is a good example of the kind of houses erected at a time when comfort and convenience were the principal objects studied.

THE INFLUENCE OF THE MYLNE ON THE ARCHITECTURE OF EDINBURGH.*

IN the case of the family of Mylne we notice this interesting peculiarity, that the name of the builder can be shown to be connected with a vast number of structures throughout a long period of time. John Mylne became master mason to James III. Abbot Alexander Mylne was master of works to Dunkeld Bridge, and afterwards one of James V.'s principal advisers on architectural matters. In other respects, also, he was a considerable personage, and played an important part in the history of Scotland. We are, however, on the present occasion considering the influence of the family of Mylne on the architecture of Edinburgh, especially during the seventeenth and eighteenth centuries.

John Mylne of Perth first came to the fair capital of Scotland, of such high renown in ancient story, in the year of grace 1616. His main object was, at the request of the town council, to complete the ornamental statue of King James VI., ordered to be placed on the Netherbow Port in honour of his majesty's expected visit to his native land, which took place in the following year. This decorative work was carried out in an elaborate manner, since "sixty buiks of gold" were secured at 80*l*. Scots; and Henry Mylne, goldsmith, was employed to make the sceptre of St. Andrew and St. George with the order of the thistle. Full particulars will be found on page 106 of the "King's Master Masons." When once a successful start had been made, other employment quickly came to hand. John Mylne was appointed to erect a new basement structure for the city cross, and on March 25, 1617, "the croce of Edinburgh was put upon the new seat." He also carried out works at the West Port, and was paid 10*l*. "for making the scaffold that the provost, baillies and counsall stood on at his majestie's entry." On June 4 he was made a burghess.

After taking part in the erection of the church at Falkland, the new steeple of the Tolbooth at Aberdeen, the sun-dial and some portions of Drummond Castle, John Mylne is summoned to Edinburgh to construct a water pond at Holyrood for Charles I., and soon afterwards is appointed king's principal master mason under writ of the Privy Seal. Amongst other works executed for the king, he was employed to make the celebrated sun-dial now standing to the north of Queen Mary's Tower in the royal gardens of Holyrood—a beautiful piece of work, richly decorated with the initials and appropriate emblems of the princes of the house of Stuart.

In the erection of the sun-dial he was closely associated with his two sons, John and Alexander, and in 1636 he resigned the office of king's master mason in favour of his eldest son John, and retired to Perth or Dundee, the towns where he had spent his boyhood, and where he executed various works in his old age. At the time of his decease he was master of the Ancient Lodge of Scone and Perth.

With his appointment as principal master mason to the king in the year 1636 his official career commenced. In the same year he was elected deacon of the masons and a member of the town council, and in 1637 became master mason to the city of Edinburgh, when he furnished designs for the Tron Church. This sacred edifice was completed ten years afterwards, in 1647, and was then larger than it is now. The original steeple also was destroyed by fire in the reign of King George IV. Full particulars, together with two views of the structure, will be found at pages 135-37 of the "King's Master Masons."

John Mylne was also employed by the town council to repair the great east window in St. Giles, as well as some other portions of that famous church.

About this time, as well as in 1648, the city of Edinburgh expended various sums of money on the crown steeple of St. Giles, and the upper portion of the crown may have received

* A paper by the Rev. Robert Scott Mylne, M.A., D.C.L. (Oxon.), F.S.A. (Lond.), read at a meeting of the Edinburgh Architectural Association, and published in the Transactions.

its final shape at this period, in connection with special repairs undertaken on the creation of the bishopric of Edinburgh, but the general design is evidently connected with the close of the Middle Ages, as may be proved by a careful comparison with the other ancient crown steeples of Great Britain. It is a curious fact that while we know the crown steeple of Newcastle was completed in 1474, no particular date can be discovered for St. Giles, though the meagre evidence points to somewhere about A.D. 1500.

In 1642 John Mylne executed various repairs at the abbey church of Jedburgh, and in the next year became master mason of Heriot's Hospital, in consequence of the death of William Aytoune, the successor of the celebrated William Wallace. In July 1649 the upper portion of the south-east tower was ordered to be rebuilt exactly like the north-west and north-east towers.

The times were troublous and warfare was in the air, and in 1646 Charles I. selected John Mylne as master gunner of the royal castles and captain of pioneers, while the citizens of Edinburgh sent him, in conjunction with W. Thomson, to negotiate with the officers of Cromwell's army quartered at Dalkeith early in 1652. He was also appointed to represent Edinburgh on the Commission to arrange a treaty of union between Scotland and England under the sanction of Oliver Cromwell, and the next year was present at the solemn proclamation of the Lord Protector at Perth.

As a member of the town council he took great interest in the different alterations made in the city churches under the Commonwealth, and Nicoll, in his "Diary of Transactions in Scotland," states that he and a wright named John Scott "did mislead the rest," and put the inhabitants to very heavy expenses. He also undertook the construction of additional buildings for the University of Edinburgh and repaired the Grammar School, while he represented the city for four years at the Convention of Royal Burghs. At the restoration of the House of Stuart he was confirmed in all his offices by King Charles II., and employed in reference to Holyrood. His last important work was the building of Panmure House in Forfarshire. In 1667, the year in which he died, he furnished the plans for the existing Town Hall of Linlithgow, and is simply described in the diary of Lamont of Newton as "the great master mason who departed out of this life at Edinburgh." His fine monument in the Greyfriars Churchyard is doubtless well known to every citizen of the Scottish capital.

Robert Mylne of Balfargie will always be known to fame as the builder of Holyrood Palace, which was by far the most important of his different works in the city of Edinburgh. His uncle John, whom he succeeded in 1668 as king's principal master mason, had already prepared some plans, and one of the sheets discovered in the Bodleian Library at Oxford indicates what Charles I. wished to have done had he not been prevented by untoward circumstances, as well as certain other early suggestions. The six plans drawn by Robert Mylne for Charles II. are for the first time published in the "King's Master Masons," at page 168. The last of these sheets shows the owners and claimants of the lands around Holyrood on the restoration of Charles II., and thus contains much curious information. Some of the correspondence bearing on the legal titles well illustrates the general circumstances of the times.

The curious comments of the king upon the plans actually used are worthy of note—the chimneys in the angles and corners that so offended the sensitive taste of John Evelyn, and the abrupt conversion of the Chapel Royal within the palace into a wine cellar, as well as the questions raised about the proper height for the western front and the width of the great gateway. It was perhaps fortunate that the king's ideas were not carried out in every particular. The official contract was signed at the Canongate and Edinburgh, March 11 and 12, 1672, for 57,000*l.* Scots, and particularly mentions the ornamental use of stone columns of the Doric, Ionic and Corinthian order. Due advantage was taken of foreign labour and foreign materials. Lord Lauderdale had already employed Dutch workmen at Ham, and in the detailed accounts for the building of Holyrood we find Jan Vansautvoort received 40*l.* Scots for carving chimneypieces, and the well-known De Wet was paid various sums for decorative painting. Twelve chests of French glass were supplied by David Calderwood, and white lead and marble by sea from Holland. Henry Frazer received 25*l.* Scots for furnishing English gold-leaf. The great bulk of the heavy materials were, however, provided in Scotland, and thus we find Sir W. Binning received 2,212*l.* 16*s.* Scots for twenty-nine dozen great joists delivered by him at the Palace of Holyrood, while James Bayne received 1,239*l.* 8*s.* for plaster-work. There were two further contracts entered into in the year 1676. In the first, due provision was made for taking down the work on the west quarter built by the English, or the usurpers as they are called in the previous royal warrant; and in the second, proper arrangements are made for rebuilding the fore-front wall between the two great western towers, with

a gateway of the Doric order. Here we see how the old tower of Queen Mary was the key to all the later design and the one enduring portion of the pre-Reformation structure.

By the year 1680 the palace was entirely completed, and the royal accounts of 1681 deal with expenditure on paving and the gardens, which cannot be laid out "till his majestie think fitt to order in whatt manner they are to be finished." For two centuries since that date the palace has remained without material alterations, a noble and enduring memorial of the overreign princes of the ancient house of Stuart.

Beside his work at Holyrood, Robert Mylne of Balfargie was employed on many other lesser buildings in the city of Edinburgh and various parts of Scotland. He erected the cross of Perth, taken down in 1765. On the occasion of the king's birthday in 1669, "the counsell ordaines the thesaurer to prepar tua gallonis of French wyne with tua dussone of glasses to be druckine and rune one the croce." Robert Mylne also built Wood's Hospital at Largo, consisting of fourteen rooms and a public hall. He likewise superintended the works at Leslie House, while the Earl of Rothes was attending the royal court in London. Our attention, however, must be more particularly given to the city of Edinburgh, and here in 1674 Robert Mylne was busy in connection with the water supply, and constructed a large cistern at the head of the West Bow, 15 feet by 10 feet, and 6 feet deep, as well as other cisterns in various parts of the town. The Bow Well was restored in 1861.

After erecting a bridge of a single arch over the Clyde at Romellweill Crag (now called Ram's Horn Pool) in the county of Lanark, he built for his own purposes a large stone tenement or house upon the shore of Leith, the north gable of which adjoined the Timber Bush. The ground was taken on feu from the city of Edinburgh, and the builder further undertook to construct a windmill 32 feet in diameter over the walls. The windmill is gone, but the house still stands on the shore of Leith.

Mylne's Square in the High Street and the battery in the castle also provide clear and distinct memorials of the master mason's personal activity, and connect the days of the Stuart kings with our own. Yet all such landmarks of the past are rapidly disappearing before the quick advance of modern improvements. According to the received tradition, the famous Treaty of Union between Scotland and England was hurriedly signed in one of the secluded cellars beneath the High Street frontage of Mylne's Square, the Commissioners having been driven from Moray House by the senseless fury of the mob.

Robert Mylne was also connected with the building of Writers' Court, and more specially in preparing "the great northmost room" for the occupation of the Writers to the Signet in 1696, before that honourable society had possession of their present noble and commodious buildings.

He also presented "a draught for finishing the steeple of Heriot's Hospital" in 1693, and was paid 3,100 marks for executing the same by the council. From time to time he also carried out various repairs in different parts of the historic castle of Edinburgh.

After a long and honourable public career, extending over nearly half a century, he died in his own house at Inveresk on December 10, 1710, at the age of seventy-seven, surrounded by his children and grandchildren, and was buried in the family vault in the Greyfriars Churchyard, beneath the well-known monument he had erected to his uncle's memory. His epitaph runs thus:—

Sacred to the memory of Robert Mylne of Balfargie,
Master mason to several kings of Scotland,
And surveyor to this citie,
Who during an active life of honest fame
Built among manie extensive works—
Mylne's Court, Mylne's Square, and
The Abbie of Halierud House.

Thomas Mylne of Powderhall, near Edinburgh, was the eldest grandson of Robert, the king's principal master mason. For many years he was surveyor to the city of Edinburgh, and in this capacity exercised a considerable influence on the development and general style of the public buildings in the city.

Robert, the eldest son of Thomas Mylne of Powderhall, in the year 1754 went to Italy to perfect his study of architecture, and for four years made Rome his residence, where in 1758 he obtained the Papal silver medal of the Academy of St. Luke, as a reward for his proficiency in architectural studies. "Virtutis amplissimum præmium est gloria" was the motto surrounding the delicately-chased head of Clement XIII.

On his return to Britain he was at once appointed to build Blackfriars Bridge in London, and, settling in the great Metropolis, became famous as engineer to the New River Company, surveyor to St. Paul's Cathedral, and also to the Stationers' Company. But we must confine ourselves to his work in Edinburgh, which consisted in the erection of St. Cecilia's Hall, designed after the elegant model of the Opera House at Parma, in the sunny plains of Lombardy.

Robert Mylne was also recognised as an authority on water questions, and in 1789 issued a report on Heriot's Park Reservoir, and a few years afterwards he was consulted upon the reservoir on the Pentland Hills. He died in 1811, and was buried in St. Paul's Cathedral.

His brother William built the North Bridge, so marked a feature in the central portion of the town. This handsome but ponderous structure was some time in building, and must have presented a more attractive appearance before the existing cast-iron projecting footways were affixed to the upper stonework. At the time of their addition, about twenty years ago, there was an alternative proposal to widen the bridge 20 feet by refacing the eastern side. This excellent idea (so successfully carried out at Aberdeen) was, however, abandoned on the score of expense. No funds were available for the purpose.

Though the general plan of the bridge was arranged in 1762, the foundation-stone was not laid until October 21, 1763, by the Right Hon. George Drummond, lord provost of Edinburgh, with full masonic honours. Provost Drummond had been Grand Master of the Grand Lodge of Scotland, and seventy of the brethren belonging to the Lodge of Edinburgh were present on this auspicious occasion.

For "a stone bridge across the North Loch, from the High Street, where the Cap and Feather tavern now stands, to the opposite bank at Multree's Hill," the contract price was 10,140*l*. The whole work was to be completed in 1769, and an abstract of the lengthy contract, together with the correspondence following on the serious accident to the south abutment, will be found in the "Master Masons to the Crown of Scotland," pages 253-58. We may observe three arches were to be 72 feet span each, and two of 20 feet span each. The piers were to be 13 feet 6 inches in thickness, and the total length 1,134 feet. The breadth between the parapets was fixed at 40 feet, and the entire height from the base line to the coping of the parapet 69 feet 6 inches.

This great bridge was the last important work executed by the family of Mylne in the ancient city of Edinburgh. William, the architect thereof, subsequently migrated to Dublin, where he died in 1790, being engineer to the waterworks of that city.

TESSERÆ.

The Province of *Æsthetics*.

THE mere word "*æsthetics*" is vague and poor enough; it was invented by Baumgarten to express "the doctrine of emotions," because art addresses the feelings rather than the intellect. But this, as all abstract terms, requires elucidation, and this elucidation can only be completely gained by a study of the thing, to which after a few remarks we shall address ourselves. *Æsthetics*, then, is the philosophy of art. It is not criticism, neither is it technical knowledge, but the theory of the inner life and essence of art. It is not purely empirical, like criticism, which is the knowledge of peculiar facts or laws, derived from observation of works; but the theory of art generally—the development of the fundamental idea through its particular forms and manifestations, thus deducing all secondary laws, all critical canons, from the one primary law. Such is *æsthetics* as a science—the *à priori* theory of art—the absolute statement of the conditions, means and end of art, rigorously deduced from philosophical principles. Criticism of course, if it would be philosophical, must grow out of an *æsthetical* foundation as the practical and applied form of its philosophy, and so in common conversation or writing *æsthetics* and criticism are often confounded. Nor is there much harm in this, if the empirical and philosophical natures of the two be always distinguished. When an incident, character, or sentiment is said to be not *æsthetical*, it is meant that such is a violation of the feeling which it is the end of art to produce. Prosaic passages are, therefore, non-*æsthetical*, as also are contradictions of known laws of pleasurable emotion. Criticism is to *æsthetics* what the practice of medicine is to physiology—the application to particular cases of the fundamental knowledge of the constitution and organisation of man, aided by a mass of particular observations. *Æsthetics* is the physiology of art, and as all art has a philosophical foundation, so it necessarily demands a philosophical elucidation. The necessity for a philosophical *fundus*, not only to criticism, but to all forms of speculation, cannot, one would think, for an instant be doubted, and certainly not by those imbued with German literature, where the existence of such a stratum lying underneath the whole of practical thought is the one thing prominent and distinctive.

Building Stones.

Stones, including granite, marble, porphyry, slate and the other varieties, have been from all antiquity the leading material of monumental edifices, and, except for decorative purposes, the stone of every locality has ever been employed in its constructions. We are apt to marvel at the wondrous

golden splendour exhibited in the edifices of Attica by the use of marble; but, in truth, Mount Pentelicus was in a suburb of Athens, and its marble quarries the nearest at hand. In other parts of Greece, stone, even of the coarsest grit, was used, and in the edifices on the banks of the Nile the quarries of the neighbouring hills furnished the material, as the quarries of Mocattam for the core of the Pyramids of Ghizeh. The granite of Syene and alabaster was of rare structural application, and used almost exclusively for the monolithic statues, obelisks, or sarcophagi. The general aspect of the city of Paris, where stone is the general material, and not the exceptional one as in London, has always been an object of envy to English architects. But even there the atmospheric influences act very much upon the stone, which becomes as dark as in London, a defect removed by periodical cleanings and scrapings. The small heights of the courses, especially in the frustra of the columns, as at the Madeleine, are nevertheless very disfiguring to their principal buildings. Recently, however, they are able to overcome these defects, for, by means of the railway and a greater spirit of enterprise, distant quarries of a very superior quality of stone have been opened up to their architects, and their monumental edifices have gained immensely in structural character. We in England have no reason to be dissatisfied. We have stones of the finest qualities, whether of the limestone, magnesian limestone or sandstone division. Our Bath oolite is equal to that of Paris, if only our miserable economy in some cases and the spirit of competition among unprincipled contractors, the stone merchants and quarrymen themselves, did not counteract the intention of the architect and bring into use the stone from inferior beds instead of from the soundest and best strata. There is not a better stone than our sea-girt Portland, if only properly selected, whether for its tone, its homogeneity, or resistance to the atmosphere. St. Paul's Cathedral, thanks to the precautions of the illustrious Wren, and Somerset House, may be cited to prove the enduring qualities of this material, when carefully chosen in the quarries. In these two buildings the arrises of the mouldings and angles and the very carvings still retain their sharpness. Where the south-westerly rains wash the soot and smoke from the face, the surface is brilliant and the shadows sparkling. In such an atmosphere as that of a neighbourhood where the acids of the manufacturing, as in Lambeth, are poured forth broadcast from the furnace shafts, no stone can resist their corroding effects; and it is to this, and not to the quality of the stone, that the partial surface decay of some parts of the stonework of the Palace of Westminster is mainly due.

Norman Vaulting.

The cause of the very few instances of Norman groining remaining, except in crypts, and the fair presumption that not many ever existed, is a subject open to investigation, and a speculative idea may be not without its utility in eliciting satisfactory information. Thick as the walls of that period are known to be, the risk that would have attended charging them with stone ceilings, without the auxiliary resistance of external buttresses, may have become an object of anxiety with the builders, and the execution of such works in stone may have been attended with difficulties which even at this time would be considerable, and may then have proved altogether insurmountable, except under the most favourable circumstances and amplitude of means. The centering alone, if considered for a moment, is an object involving so considerable an amount of expense and practical skill that we cannot wonder that, even in the best days of art, methods should have been devised for dispensing with it, and hence doubtless arose the adoption of wood at Lincoln, York, and elsewhere. Did not the Norman builders feel and shrink from the difficulty like their successors, but without the good fortune to hit upon so happy an expedient? We know that they affected the groin from its constant adoption in crypt and aisles, when a moderate span facilitated its execution.

Vignola's Architecture.

In treating the more ornamental style Vignola was the best among the Roman architects; but his buildings still retain something of the severity of his predecessors, and they fall far short of the grace and elegance seen in Vicenza. Within Rome he has left very little but the court of the Farnese Palace, which is not very fine, and whose style he has preposterously carried to the outside of the building to form the centre of its north-west front, although entirely discordant with the work of Sangallo. Outside of the gates are the little church of Sant Andrea and the Villa Giulia, a work of considerable beauty and great defects, and now in a very forlorn condition. The church of Sant Andrea has been much admired, and even pointed out as a model for young architects, yet it is full of faults. It is oblong on the plan, covered with an elliptical dome—a bad form, for which it does not appear that there was any sufficient reason, since a design occupying the same ground, with a square room and a portico, would have given to the front the relief that it wants, and offered a reason for the pediment which is

now placed against the plain wall. It is too high, both externally and internally, and yet with all this there certainly is united considerable beauty in the proportions and in the principal parts. In the front of the Villa Giulia the upper storey wants height and consequence, as from its distribution and style of ornament it certainly ought to be the principal. The back court and nymphaeum present in some parts a pleasing variety of lines, but there are too many breaks, and the whole is too intricate and, what is worse, whimsical. Vignola when licentious has less grace than Borromino; his forte is in correct architecture. The circular gallery above produces a very pleasing effect, and would be admirable if filled with sculpture; at present it is forlorn and naked. The most famous work of this architect is the Palace of Capraruola. It forms a pentagon with a bastion at each angle, as if it were a fortification, and may be considered to be one of those cases where difficulties were created in order that ingenuity might be displayed in overcoming them.

Masonry Construction.

The dressing of stone is a most important operation, and generally the larger the blocks the greater the care required in this particular, as to levelling the beds or dressing them in the proper angle or in the squaring. If the beds are irregular, or in winding the bearing is unequal, the stone tends to split and rend at bearing points, which act as fulcrums, and in fact may have to be loaded with an enormous weight. This cannot occur if the beds have been well levelled, as the bearing is then equal throughout the bed. The rent receives rain-water, and allows it to lodge, and the structure becomes exposed, often in a dangerous manner, to the effects of frost. If the blocks of stone are fairly and fully dressed, the trouble of laying them will be comparatively slight. Care must be taken that in order to hide or disguise a thick clumsy joint the blocks be not pitched forward on their edges, as they will then be sure to splinter at the edges, from the weight bearing on the angle. To disguise the careless dressing of blocks, and to work them when laid, workmen are apt to underpin large blocks of stone with wedges of wood or splinters of stone, thereby laying the foundation of rents and fissures when the work settles. The setting-bed of each course should be brought true and level to receive the next course, which must rest solidly and truly upon it. The face of every stone in a wall may be left quarry-faced, or as it comes from the quarry, but each stone should be wrought with a setting margin. The dressing of the beds of large blocks of stone may easily be tested, by laying the edge of a straight rod or rule (otherwise a straight-edge) along the surface of a block, from angle to angle and from side to side, when any winding or irregularities in the setting-beds will easily be seen by parts of the edge of the rule lying close to the stone, whilst cavities admit the light between the bed and the rule. In building with ashlar or other large stone care must be taken that pebble and small stones be not used in the mortar, as these will act as so many wedges on the beds; but in grouting, or filling in at the back of masonry, there is no objection to splinters being used, and in filling in angles and odd corners in rubble backing they may come in advantageously, not only to save waste of mortar, but because when the mortar sets the work will be better filled. Unfortunately, this is where masons will often not take the trouble to use splinters of stone.

Milizia's Principles of Architecture.

Architecture, like every other fine art, is subject to the following general rules:—1. In all its productions we should find an agreeable correspondence of the parts with the whole. This is known by the name of symmetry. 2. It ought to have variety, lest the spectator's attention should be wearied; and unity, which is opposed to confusion and disorder. This is comprehended in the term *eurithmia*. 3. Convenience or suitability is also a necessary quality. This consists in a just application of symmetry and *eurithmia*, and of that relation which ought to subsist between an edifice and the purpose to which it is applied; between the details of ornament and the general appearance of the building, choosing the most appropriate, and the style which accords best with the magnificence or simplicity of the structure. 4. If architecture be the daughter of necessity, every beauty which it possesses ought to connect itself with that necessity, and to appear made for some useful purpose. In every art which administers to pleasure, the artifice ought not to be discovered; everything done for mere ornament is a defect. 5. The principal ornaments of architecture are its orders, which in fact are rather to be considered as the skeleton and most essential part of the edifice than as mere ornament. We might therefore define the orders, necessary ornaments arising from the nature of the edifice. All the other decorations of architecture are subject to the same law. 6. Consequently in architecture the decoration is the result of the construction. Nothing is ever to be seen in a fabric that has not its appropriate use and is not an essential part of the structure; the office that it indicates it ought to perform. 7. Consequently nothing is admissible for which a good reason cannot be rendered. 8. These reasons are to be

deduced from the origin and analysis of that primitive natural architecture, the hut, from whence has arisen the beautiful imitative art of civil architecture. This is the pole-star of the artist in his works, and of the intelligent observer in examining them. Everything should rest upon truth and verisimilitude. What could not really exist cannot be approved, although evidently a matter of mere show. 9. Examples and authority, however they may be appealed to, will never influence him who wishes to be reasonable. These principles are constant, positive, general, because they depend on the nature of the thing itself, and on good sense. Taken together they constitute the true and essential beauty of architecture; if they are kept out of view, adieu architecture. It is no more a science or an art, but is changed into mere fashion, caprice, or delirium.

Roman Baths.

The general plan of the Roman thermæ seems to have been that of a large rectangular, central building, placed in a spacious enclosure, surrounded by smaller edifices, and on one side of this court there was a large open theatre, or rather cavea. This disposition may be traced in the three which exist the most perfectly; of the others we have not sufficient materials to decide whether it was adopted or not, and only conclude it to have been so from analogy. It is very conspicuous in the Baths of Caracalla, only the cavea, instead of being semi-circular, is in the form of half a stadium or circus. The ruins of these baths are very considerable, and are impressive by their vast square mass, and internally the immense piles of brick and rubble give it a solemnity of character with which the deep, still blue of an Italian sky is in perfect harmony, though the tints of the ruin are of rich and glowing colours. However often one may visit them, it is always with repeated pleasure that we ramble among their massive constructions. The great central chamber seems, like the great hall still remaining in the Baths of Diocletian, to have been covered with groined arches. It was probably the first instance of groined arches covering a space of any considerable extent, and as there can be no doubt that so striking a novelty would be admired and repeated, we are not surprised at finding it in all the later thermæ. It is true that Palladio introduces this disposition in his plans of all the baths, but he appears in this, as in some other instances, to have supplied the deficiencies of one by adapting to it the parts of another without sufficient authority. The great central building was composed internally of two large colonnaded courts, one at each end, and vast halls and a multitude of smaller chambers between and on each side of them; on each side of the outer circuit of buildings there seem to have been other edifices disposed circularly, and an octagonal room, which has the appearance of a hall of entrance, occurred at each end. In one of these the celebrated Toro Farnese is said to have been found. We find in the part which now remains horizontal lines, which probably mark the situations of the marble cornices, and many other indications of the enrichments which have been taken away; we trace also pipes in the wall in various places, some apparently intended to take off the smoke, while others were to introduce water.

Treatment of Flowers in Ornament.

Suppose we wanted to make a pattern of a rose for a wallpaper. We might pick one from our garden (if we had one, as, indeed, every designer ought to have) and sketch it exactly as we found it—a portrait as near as we could make it of an individual rose with all its accidental characteristics. Well, we might make an interesting study certainly, but when we came to apply it we should perceive that it made, however good as a study, a very poor pattern, and its virtue and interest as a drawing would be at once destroyed directly our pictorial rose was repeated—which we should be driven to do. We should practically get the repetition of a more or less shapeless blot, a formal and regular repetition of an informal and naturalistic drawing—a contradiction in terms, in fact. Yet it is a thing that has been attempted over and over again. A sentimental public perhaps likes roses, in season and out of season, and considers perhaps that a rose in any material would, if not smell, at least look as sweet. It may be so, but if it be not sweet and clear, in line and disposition, and organic as a pattern, its sweetness is wasted on the desert air of false art and taste and failure in decoration. Therefore it is that the designer, having regard to the conditions of ornamental effect and relation to use and material, proceeds in a very different way. He finds that a certain formalism is an essential condition of his work, seeing that his aim is to adorn a space pleasantly, to construct a pattern that will bear repetition, or rather demand it, as another essential condition of its existence. He finds, therefore, that typical and abstract forms are of more value for the purpose than accidental ones; that suggestion is better in decoration than naturalistic or pictorial imitation. He would naturally in taking a rose as his theme, recur to the primitive and fundamental type, to the simple flower as we see it on the parent stem of the wild rose of our hedges. With such a type as this he could safely make a diaper or simple-sprigged arrangement, which would be satisfactory as far as it went.

NOTES AND COMMENTS

A CIRCULAR was recently sent to the members of the Society of Architects concerning the proposed examination for membership, and inviting opinions on the project. The majority of the members agree about the desirability of such examination. The following questions were asked in the circular:—"1. Would the prestige of the Society, and of its members in your district, be appreciably raised were admission granted upon examination? 2. Were a satisfactory scheme of examination devised, would applicants, in your opinion, be subsequently attracted to the Society by having to pass it? 3. Do you think that it would be a wise step to institute an examination prior to admission to membership of the Society, due notice being given? 5. Should a register of students be opened in connection with the Society?" The replies were almost without exception in the affirmative. The fourth question was:—"Under what circumstances, if any, should admission be granted without examination, if one be instituted?" A majority of the members replied that the present system of election (which prescribes nomination by members or architects of repute, and the submission of drawings and photographs of completed works) might be applied to architects of standing and mature age. Various suggestions were also offered by the members. A report on the subject will be issued by the Council in the course of next month. The Society can of course make any arrangements that are considered advantageous, but would it not be more convincing to candidates and the public if the examination test were applied to all the members? If the prestige depends on that course, it should have been adopted at the formation of the Society a few years ago.

THE Venetians must of late years have often regretted that their labyrinthine city was not adapted as a site for an international exhibition. They have a misgiving that the "improvements" have not increased the number of visitors, who were the most profitable of all imports; and as big exhibitions are supposed to attract crowds, one might serve as a compensation for the losses which have followed the engineering works. Chicago was able to take a hint from Venice by making the exhibition buildings appear to rise out of water; but the city which "began with ATTILA and ended with BUONAPARTE" does not possess a Jackson Park of a square mile in which the nineteenth century could display its productions. As a substitute, it is proposed to hold an exhibition of works of art which is to be opened in April next. The jury will not be too exacting when judging the works that are sent. Plenty of pictures are therefore likely to be forthcoming, but whether any of them will find purchasers is less certain. The majority of artists have kindly feelings towards Venice, and there was no difficulty in obtaining patronage in all parts of Europe, as the following list will show:—Austria-Hungary—M. DE MUNKACS, L. PASSINI; Belgium—C. VAN DER STAPPEN; Denmark—P. KROYER; England—L. ALMA-TADEMA, Sir E. BURNE-JONES, Sir F. LEIGHTON, Sir J. E. MILLAIS; France—E. A. CAROLUS DURAN, P. DUBOIS, J. J. HENNER, G. MOREAU, P. PUVIS DE CHAVANNES; Germany—M. LIEBERMANN, G. SCHÖNLEBER, F. VON UHDE, A. VON WERNER; Holland—J. H. L. DE HAAS, J. ISRAELS, H. W. MESDAG, C. VAN HAANEN; Italy—G. BOLDINI (Paris), F. CARCANO, C. DALL'ACQUA (Brussels), C. MACCARI, F. P. MICETTI, G. MONTEVERDE, D. MORELLI, F. PASINI (Paris); Norway and Sweden—E. PETERSSEN, A. ZORN; Russia—L. BERNSTAMM; Spain—J. BENLIURE, J. JIMENEZ ARANDA, J. SOROLLA, J. VILLEGAS. These gentlemen do not assume any responsibility, and it has yet to be discovered whether competent persons will insure that works of art will be returned in a safe condition, and that all the efforts of custom-house officers to secure delay will be frustrated.

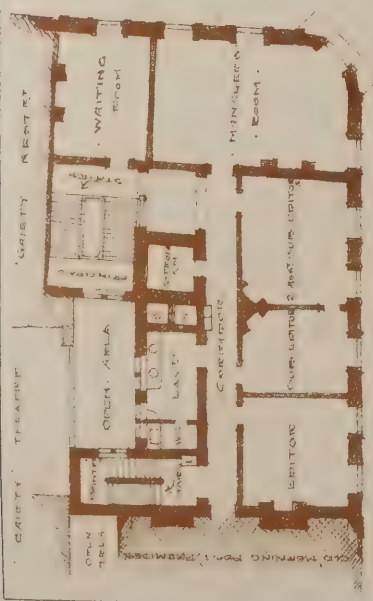
THE critical notices of the Salon, by M. PAUL LEROI, in *L'Art* are arranged this year on a novel plan. Biographies of the artists and portraits of several of them are given, as well as descriptions of the pictures. As usual, M. PAUL LEROI is trenchant in his judgments. As regards the paintings he says that the characteristic of the exhibition may be shortly expressed by the phrase "Elle est

bête." The exceptions are the works of foreign artists. The principal cause he ascribes to the efforts of the Government, who every year turn out of the schools a crowd of architects, sculptors, medallists, painters and engravers who have no aptitude for art, but are all stamped as artists and have a claim on the exhibitions. The only remedy for so deplorable a state of things was suggested to M. PAUL LEROI by one of the most eminent members of the Institut, when he said "the Ecole des Beaux-Arts must be closed immediately and transformed into a museum." Unfortunately there are political interests which are adverse to that course, and moreover, as some foreigners make use of the school, the upholders of it are able to announce that art throughout the world must suffer if any check were put on the manufactory in the Rue Bonaparte.

As political complications can arise out of trivial incidents, it is to be hoped no dangerous consequences will follow an announcement which has appeared in the *Moskowskija Wedomosti*. It stated with the gravity that becomes all political events that an understanding had been come to between the Emperor of GERMANY and the Shah of PERSIA respecting the paintings belonging to the Eastern monarch which are in Munich. It is easy to imagine how amazed were the diplomatists at the intelligence, for it would appear as if the Shah had contrived to evade observation, and from time to time found a refuge in the Bavarian capital. Some hours elapsed before the truth became plain. Then it was found that the startling piece of news was created by a newspaper correspondent whose vision was too keen. Among the collections of pictures in Munich is one which belonged to Count SCHACK. On his death, which occurred lately, he bequeathed it to the German Emperor. The people of Munich were disappointed, and there was some commotion when it was stated that the pictures were to be removed to Berlin. The Emperor took a right view of the case, and decided that they were to remain in Munich. The Moscow paper, and probably several others, obtained a version which may have lost nothing on its way, and Count SCHACK'S pictures were converted into those of the Shah.

IN these days, when the cheapest literature has a hard struggle for existence, since free libraries and other philanthropic institutions supply all classes of books without any payment, it is refreshing to learn that the Baron von GEYMÜLLER proposes to bring out a "Thesaurus of Architecture" which is to cost 1,000*l.* a copy. It is a project worthy of an art which has so little modernity. The American architects, to whom a communication has been addressed by the Baron, have not sufficient appreciation of antique modes of building or trading to accept his proposal unless there is some modification of the conditions. They consider that the Baron ought to agree to print a larger number of copies, in which case the "Thesaurus" could be sold for 200*l.* But the projector would have more chance of finding thirty people who would be willing to pay 1,000*l.* for a fad than one hundred and fifty who would care to pay the smaller sum. The chief interest of the book will be its costliness and rarity, for we doubt if ownership of the "Thesaurus" would afford much aid to a competitor, or would enable a layman to become his own architect and be secure from the litigation which commonly follows such an experiment.

THE purchase of modern French paintings in England has become so common that a transaction of the kind rarely attracts attention. There is not much reciprocity in France, especially in dealing with pictures, and an English artist who finds he has attracted a buyer by exhibiting a work in the Salon has some reason to suppose he is possessed of unusual merit. Mr. J. H. LORIMER is in that favoured position. His *Benedicite: fête de grand'mère*, showing a family around a table, which is lighted by candles having yellow shades, has been secured by the French Government. Mr. LORIMER has studied in Paris under M. CAROLUS DURAN, and he has already received a medal from the Salon. In the Royal Academy Mr. LORIMER has one work, *The Eleventh Hour: Mariage de convenance*, which is of the class that has attractions for the crowd.

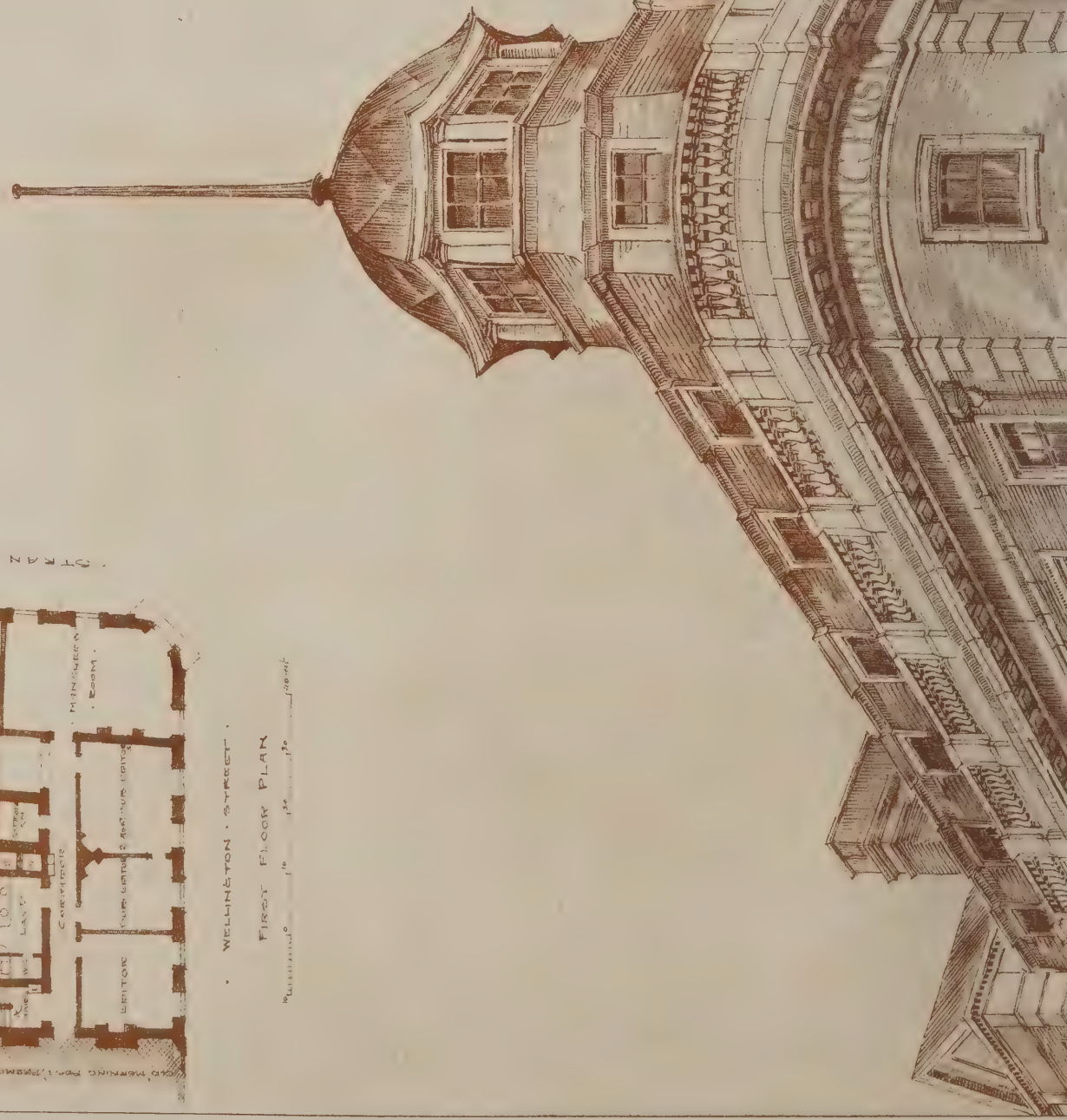


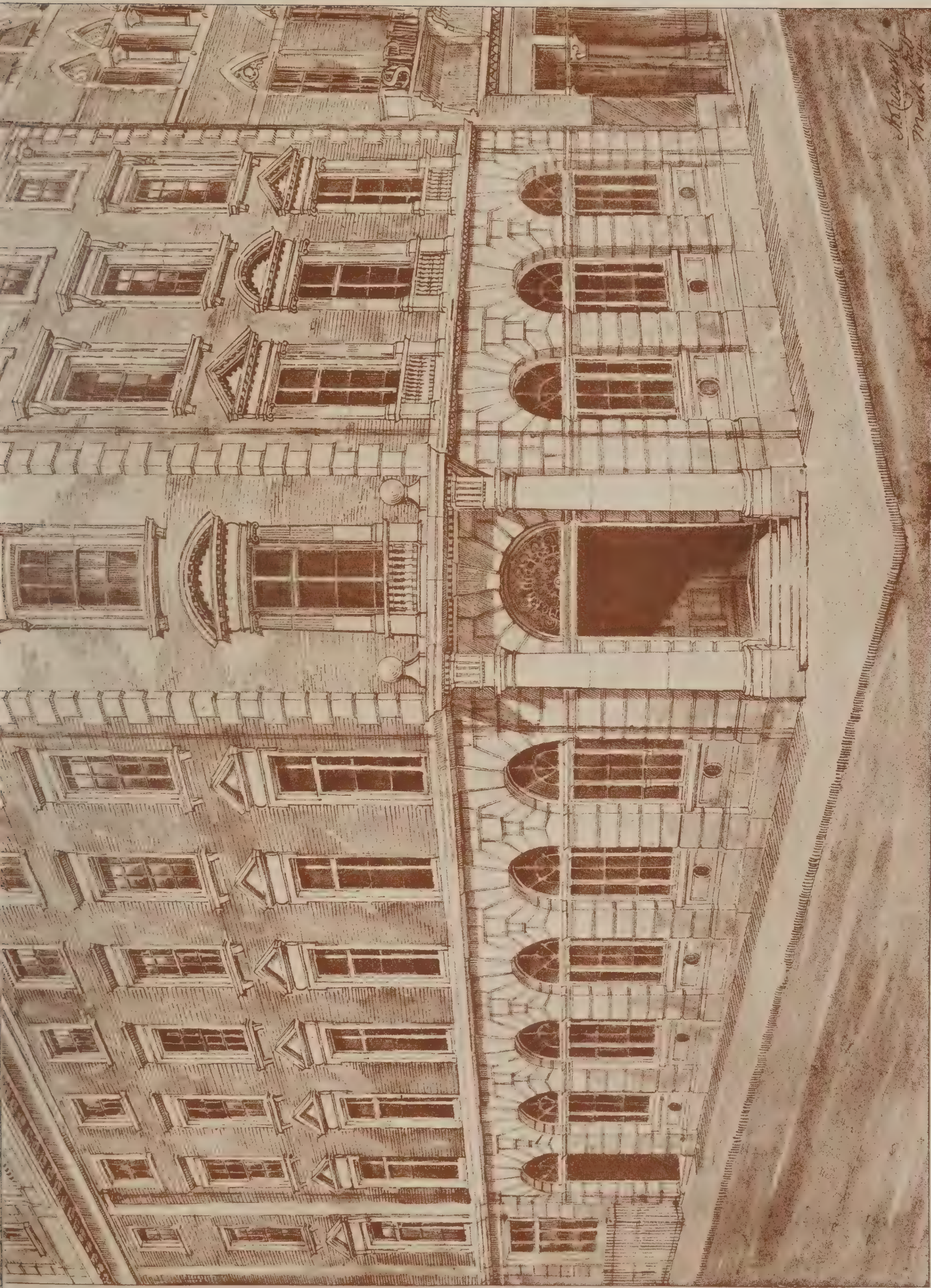
WELLINGTON STREET

FIRST FLOOR PLAN

Scale 1" = 10' 1" = 20' 1" = 30'

346 STRAND W.C.
EXTENSION OF PREMISES
FOR THE
MORNING POST
H.O. CREEDONELL ARCHT





INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



INK-PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

"WHINFIELD," HEADINGLEY, YORKS.

The Architect, May 25th 1894.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"WHINFIELD," HEADINGLEY, YORKS.
T. BUTLER WILSON, F.R.I.B.A., Architect.



WHITE HART HOTEL
G. W. WEBB, F.R.I.B.



ILLUSTRATIONS.

346 STRAND, W.C.—EXTENSION OF PREMISES FOR THE "MORNING POST."

OUR illustration shows the new extension of premises of the *Morning Post*, which has been recently completed at the corner of Wellington Street and the Strand, and adjoining the old premises in Wellington Street.

Externally the general lines of the old building had to be followed, the materials used being red brick and Portland stone. Internally the accommodation provided includes advertisement office and cashier's department on the ground floor; manager's department and additional rooms for the editorial staff on the first and second floors, caretaker's rooms on the third floor, and an extension of the composing-room and reading-rooms on the fourth floor. In the basement is the machine-room, including new boiler and engine, with coal stores, &c., and set of new web printing machines by FOSTER, of Preston.

The building is of fireproof construction throughout, the floors being on FAWCETT'S system and the internal partitions of concrete and iron, wood being only used for joinery-work and fittings.

The general contractor for the work was Mr. D. CHARTERIS, of Westminster, the hot-water work being carried out by Messrs. ASHWELL & NESBIT, and the electric lighting by Messrs. BERRY, HARRISON & CO. The architect was Mr. H. O. CRESSWELL, of 30 Craven Street, Strand.

WHITE HART HOTEL, BLACKWATER.

THIS hotel has been rebuilt for Messrs. MAY & Co., Basingstoke, and stands on part of the site of the old building, which has been pulled down owing to its unsafe condition. The new building is much larger than the old one. On the first floor there is a large assembly-room used for balls, masonic and other purposes.

The facing bricks are of a deep red tint, supplied by LAWRENCE, of Bracknell, and the tiles of a dark red colour, by BREWERTON, of Caversham. The work has been carried out by Mr. J. HARRIS, contractor, of Basingstoke, from the designs of Mr. GEORGE W. WEBB, Market Place Chambers, Reading.

WHINFIELD, HEADINGLEY, YORKS.

LONDON AND ITS ASSOCIATIONS.

A PARTY of Americans have arrived in London as sharers in "An Old Country Pilgrimage," organised by Bishop Vincent, of Chatanqua. On Thursday last Mr. Walter Besant read a paper entitled "London and its Historical Associations" for their benefit in the Westminster Town Hall.

Mr. Besant said London now meant an immense city, scattered over a hundred square miles, with five millions of people. Three hundred years ago London meant nothing but the ancient City and the Borough. Two thousand years ago, or thereabouts, the City of London was first begun. At that time the Thames valley was a vast morass, sometimes flooded at high tide. Thames Street, the heart of the City, was the first part built and settled—the first cradle of the great trade of England—and it continued to be the chief centre of trade. The people whom the Romans found here, the trade which had already made the town important, might have been settled, might have been growing, for all we know, during hundreds of years before the Romans came. The City marked out so long ago by the Roman wall never got beyond the wall. To this day the Lord Mayor was the chief magistrate of the area, a mile long and half a mile broad, marked out by the City wall. It was not till the seventeenth century that London was fairly filled up to the walls, and was running over on the north, east and west. Small as was the area of the City, it formerly contained 114 parish churches. Some of these were not rebuilt after the Fire, and a few yet survived which were not burned down. St. Paul's Churchyard was formerly enclosed by a wall and provided with four gates. The wall followed what was now the line of houses. In the north-east angle was a slab of stone with the words "Paul's Cross" carved upon it. On this place met the old Folkmote, the parliament of the people. Three times every year the citizens were called together by sound of the big bell of the cathedral, to hear and to discuss at Paul's Cross, freely and openly, all men being equal, things belonging to the welfare of their city and their trades. That Folkmote

was the foundation of all our freedom. There was a great deal more of history belonging to Paul's Cross. This was, to his mind, the most sacred spot in the world. It stood for the government by the people; for freedom of speech and for freedom of thought; for all the rights that we had made our own; for the abolition of religious authority. In an old-fashioned way he still continued to think that we were what we were, on either side of the Atlantic, because we had what Paul's Cross gave us. There was one civic institution in London which had never passed over to America. He meant that of the City companies. The reason was that when New York and Boston rose to importance the trade companies of European cities had practically accomplished the work for which they were founded. But they ought not to leave London without some consideration of the City companies. They sprang out of the guilds, and the guilds were at first religious associations. Every trade had its patron saint. The men being thoroughly educated in the duty of organisation, every trade guild became a trade company, with a royal charter, a coat-of-arms, a master and wardens, a livery, and a complete set of rules, to which the members owed obedience. When the suburbs grew up, when the working man left the boundaries of London, the power of the companies decayed. Their estates remained; a few of them were rich; they now used their revenues for the advancement of many noble enterprises, charitable, educational, technical. Down to the reign of Charles I., outside and inside the City wall there were heaps of ruins, those of the religious houses. It took many years to remove the ruins of these monasteries. Fragments remained to this century; indeed, they might still stand in the church of the Augustin Friars, and see all that was left of the Franciscan cloister. In Milton's time the sites were yet cumbered with the ruins. None of the English poets or dramatists seemed to have perceived the pathetic and the poetic side of the ruins. The ancient faith, although stubbornly retained by a few Englishmen, was never regretted or lamented by the greater number. In a single generation it was clean forgotten. If they would connect London with kings and nobles, there was, first of all, the Tower, the citadel or stronghold of London. It was built not so much for the defence as for the domination of the City. The Tower was placed beside the river at the extreme east. For two hundred years and more the citizens never looked at the White Tower without suspicion and hatred in their hearts. Then came a time when the Tower ceased to give them any uneasiness. It was when they knew and felt their own strength. They could supply the king with money and with soldiers. More than that, they could move as one man; if they chose they could dethrone the king. It was London which deposed Edward II.; it was London which finally defeated Charles I.; it was London which caused James II. to fly, and lastly, it was London which brought over George I. from Hanover. The Tower had long ceased to be a palace or a fortress; it became instead the principal prison of State, the Mint, the Armoury, the Record Office, and the treasury of the Crown jewels. But it was first and foremost a citadel to command the City, and it only ceased to be so when the king discovered the grand advantages of keeping the City in good temper. There was another view of the Tower. If Westminster Abbey contained the tombs of the great men who had succeeded, then the Tower contained the bodies of those who had failed—if imprisonment and death meant failure. Here was the poor innocent child of sixteen (Lady Jane Grey), here were Catharine Howard, Anne Boleyn, Sir Thomas More, the Duke of Monmouth, Sir Walter Raleigh, and so many others who had suffered death upon the scaffold. Westminster Abbey illustrated one side of English history, the chapel of St. Peter ad Vincula the other side. There were other royal residences in London, but one could only show them the sites, and in some cases the names, which survived. If they should see the words "Tower Royal" at the corner of a narrow little street they might be interested in it if they remembered that Queen Philippa had her wardrobe there; if they read of Bridewell as a place of correction, it was formerly a royal palace; if they should happen to look into a little secluded square called Wardrobe Place, it was the site of one of the courts of the palace called the King's Wardrobe—the church close by was St. Andrew's-by-the-Wardrobe. When they walked down the Strand, they passed the precincts of the Savoy. It was the palace in which King John of France, our prisoner, died. It was also the palace of John of Gaunt. And when they read of a ward called Castle Baynard, remember that Baynard Castle was a royal palace in Blackfriars. In the fourteenth century the nobles' houses were mostly within the walls. A noble had to find accommodation in his house for all his followers. The Earl of Warwick went about with a following of 700; Cardinal Wolsey, later, had a following of 800. These houses, in fact, consisted of open quadrangles with buildings round them. If they went to Hampton Court they had in the first two courts a town house very much like one that might belong to the Earl of Oxford in the fourteenth century. There were between thirty and forty of these great

houses in the City at the least. There were, next, the offices of the City companies, about eighty in number, most of them with their halls. And, next, they must consider the houses of the rich merchants. If they wanted to see what kind of lodging was thought suitable for a rich merchant of the fifteenth century they should go to Crosby Hall, of which a large portion still stood. In its splendid hall, now a restaurant, sat Richard of Gloucester, waiting to hear of the death of the two boys who stood between him and the Crown. Add to these great houses the splendid monastic buildings of which they had already seen the ruins, and he thought they would acknowledge that London was really a city of palaces. As to the literary associations of London, they formed a branch of inquiry quite beyond the reach of a visitor unless he stayed a long time in the City. He would illustrate this difficulty by a note on Milton and his places of residence. Milton was born in Bread Street, at the sign of the Spread Eagle, under which his father carried on the business of scrivener—that was a writer of agreements, leases, contracts and partnerships, and perhaps a moneylender as well. Where was the sign of the Spread Eagle? We did not know. There was Bread Street, but the house with the sign of the Spread Eagle was burned in the Fire. He was baptized in the church of All Hallows, at the corner of Bread Street; the church was gone. He was educated at St. Paul's School; the school was removed to another part of London. He lodged in the house of one Russell in St. Bride's Churchyard; the house was said to have stood at the back of the office of *Punch*. He removed to Aldersgate Street; the house was gone. Thence he went to the Barbican; the house—No. 17—was not pulled down till 1864. His next house was in Holborn, the house looking out into Lincoln's Inn Fields. Where was that house? No one knew. Then he had a house in Westminster; this house was only taken down in 1877. After the Restoration he went into hiding in Bartholomew Close, in which house was unknown. He then lived in Red Lion Square, Jewin Street, and Artillery Walk, Bunhill Fields. It was only two hundred years since Milton died; most of his places of residence were without the area of the Great Fire, and yet not one of the houses in which he lived now remained, nor could even the site of most of them be distinguished. This illustration would be a sufficient reason for any omission of the literary associations of London. In conclusion he bade them welcome to London. He hoped that their visit, too brief, might yet prove an introduction to the study of the civic history which was the precursor of their own civic history, from whatever American city they came. It was a city which all Americans loved to explore. It had been the creator and the champion of their own liberties. Among their ancestors—since all Englishmen of days ago were their ancestors—Chaucer, Lydgate, Ben Jonson, John Milton, Dryden, Addison, Pope, Goldsmith, Dr. Johnson, without counting later writers, loved London. Milton, above all, loved his birthplace with all the strength of his deeply passionate heart. "Behold," he said, "this vast city, a city of refuge, the masonic house of liberty, encompassed and surrounded with God's protection. The shop of war hath not more anvils and hammers working to fashion out the plates and instruments of armed justice in defence of beleaguered truth than there be pens and heads sitting by studious lamps, musing, searching, revolving new motions and ideas." It was speaking of his own time and of the Republican ideas which possessed the more generous and the nobler spirits of the age. Or, to quote Cowper's translation of Milton's Latin, he wrote of London:—

Oh! city, founded by Dardanian hands,
Whose towering front the circling realm commands.
Too blest abode! No loveliness we see
In all the earth, but it abounds in thee.

THE WEST FRONTS OF FRENCH CHURCHES.

THERE is a certain similarity in the disposition of the western front in all the French churches of the thirteenth century. The cathedrals of Amiens, of Notre Dame at Paris and at Rheims, are distinguished from our English buildings by nearly the same particulars, though they differ much from each other. They assume in this part more of a pyramidal form; the space between the western towers is proportionally smaller than with us. The doorways are much larger; a rose or marigold window is placed over the central opening, and above that is one or more ranges of niches, with statues nearly hiding the triangular gable end of the nave. Sometimes one or even two ranges of niches occur below the marigold window. Occasionally the window is between two ranges of niches, and in some instances there are two rose windows. These windows and niches form the elements of the composition, but the arrangement varies in almost every edifice.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

RICKMAN'S LETTERS ON THE ARCHITECTURE OF FRANCE AND ENGLAND.

(Continued from page 327.)

LETTER IV.

HAVING in my last paper endeavoured to trace the succession of changes which took place in English architecture from the time of the Romans till a period in which Italian architecture became common, I propose in my present communication to treat of the architecture of a part of France in the same way. It seems likely that the Romans left some better works in France than in England, for there is still remaining that beautiful specimen of Corinthian called the Maison Carré at Nîmes.

At Lillebonne a Roman theatre has been within a few years discovered and laid open.

At Bayeux the pulling-down some old houses has laid open for a short time (for other houses are building) a portion of the Roman wall of the city, within a few feet of which a fine gold medal of Valentinian was found.

At Rouen is the church of St. Gervais, which is clearly made out by the French antiquaries to be about, if not before, A.D. 350 for the crypt, and the upper part of the east end to be before A.D. 1000.

At Beauvais is the remain called the Basse Œuvre, or Low Work, as compared with the very lofty work of the new choir. This is considered the remains of the ancient cathedral, and it stands where the nave of the present cathedral should stand. This building also the French antiquaries consider of a date before A.D. 1000.

All this succession of building is of the same character; all have tiers of Roman bricks or tiles running as bonds horizontally and round the arches in nearly all the examples. All have their arches plain semicircles, and all are built with small stones and very large joints. At the Basse Œuvre at Beauvais, the lower arches remain; they are perfectly plain, and have plain square piers. At St. Gervais, Rouen, the crypt has a plain impost at the spring of the arch, much like that which continues with a plain arch almost as long as the semicircular arch itself remained. The upper part of the east end of this church, over the crypt, has regular columns just engaged, perhaps 3 inches in a diameter of near 2 feet; they are about 10 diameters high, have regular bases and capitals alternating Corinthian and Ionic; both capitals and bases are much mutilated, but can be made out; there is now no entablature.

About the year 1000 there appears to have begun that style which may, I think, justly be called Norman; for under William the Conqueror and William Rufus, we have both in France and England a series of magnificent works in a style so much the same that to an ordinary observer they would appear identical.

The two buildings which have much engaged the attention of the French antiquaries from their different character—the abbey of Jumièges and St. George de Bocherville—appear to have been finished about, or soon after, 1050. They are clearly fully-formed Norman; but one of them, Jumièges, is remarkably plain and the other much ornamented.

On an attentive and careful examination of these edifices, I do not think there is any difficulty in considering them of the same date. Some of their mouldings are nearly, if not quite, the same, and the composition in both bold and simple.

Shortly after these we have the magnificent churches at Caen—St. Nicholas, now cavalry stables; Trinity Church, or the Abbaye aux Dames, now the chapel of the hospital; and St. Stephen's Church, or the Abbaye aux Hommes.

There are also many small churches in which Norman portions remain.

It should be remembered that in speaking of these buildings it is only the Norman part which is spoken of, for almost all these churches have only a part Norman. At St. George de Bocherville nearly the whole of the church is Norman, but the chapter-house and other adjuncts are much later. At Jumièges only the nave and a few other small parts are Norman; the choir of the Abbaye aux Hommes is much later.

The character of the capitals is very various in these edifices, but hardly any of them are very materially different from those in England, except that a greater resemblance to regular Corinthian capitals is found, and at times an approach to Ionic. Very large and deep doors are not very common, but at St. George de Bocherville is a fine one.

Straight-headed apertures under semicircular arches are about as common as in England; and the zigzag, billet, fret

and other enrichments, are much the same. Windows are some plain, some ornamented; many one lights, but some two lights, with the usual pillar centre, and the two round heads under one semicircular arch.

It is just as difficult to ascertain the exact date of the introduction of the pointed arch in France as in England; but when once it was introduced it was mixed with the semicircular one in a more capricious way than in England; for here there is a little consistency in its use when mixed with other shapes, but in France its use seems to have been governed by no assignable rule, and frequently a pointed arch occurs at the very bottom of a building and everything above is Norman. From these circumstances I cannot but think that the use of the round arch, with Norman details, was continued there quite as late, if not later than in England.

A claim has been set up by M. de Gerville for a very early date for the cathedral of Coutances; but, having visited and carefully examined this cathedral, I cannot consider it entitled to an earlier date than about 1220 or 1230; and I think that any one acquainted with the architecture of England and France will consider it useless for M. de Gerville to continue a claim which would, if proved, throw all reasoning from the character of buildings into inextricable confusion.

the waving of a flame, and the tracery of the windows of this style (which are the great but not the only distinguishing feature) gives very forcibly the idea of this waving in its dividing lines.

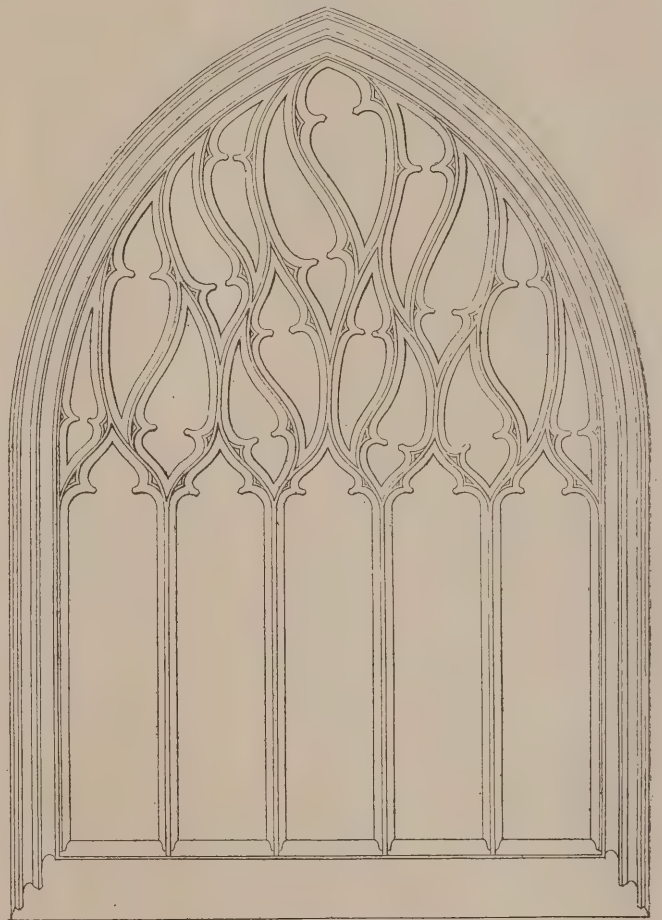
I have been compelled in some degree to anticipate in the foregoing paragraph in order to give at once the names I propose using, and here may perhaps be the best place to introduce the general corrective remark alluded to above.

In England there are few whole edifices of one style only, and even where there has been a building carried on upon one plan to completion, we sometimes find that, though the plan is retained, either the forms or the mouldings of the portions executed at the later periods are more or less adapted to the style then prevalent. Of this Westminster Abbey and the cloisters at Norwich afford examples. A second source of difficulty in assigning buildings to their proper styles is that a form common in an earlier style is continued for a long period in some particular buildings after it has been almost or quite extinct in other buildings; this is rare in England, but some examples are to be found.

In France both these sources of confusion occur to a great extent, and some buildings which have been very long in erecting have both. These anomalies in some districts are



A FRENCH DECORATED WINDOW.
Bayeux Cathedral.



A FRENCH FLAMBOYANT WINDOW.
St. Germain at Pont Audemer.

The French antiquaries, and principally M. de Caumont, in his essay in the "Transactions of the Antiquarian Society of Normandy," have divided their styles in a way different from my own division; but as a very careful examination of the French monuments does not bear out that clear distinction of the different dates which would be required for the adoption in England of all his divisions and their names, and, as the principal points are coincident in both countries (with the general correction I shall shortly state), I think it best to retain, as in England, the word "early," calling that style which began about 1200, and lasted till about 1300, Early French, to which those who wish to add Gothic may add the term if it is any benefit.

The next period, from 1300 to 1400, I call Decorated, as in England; but the last period, after 1400, being in its arrangements so peculiar and so different from our Perpendicular style as to require a different and particular appellation, I take the name given it by M. de Caumont, which is peculiarly applicable, and very easily understood by any one who will spend a short time at Rouen only in examining the buildings of this style. M. de Caumont's name is Flamboyant, alluding to

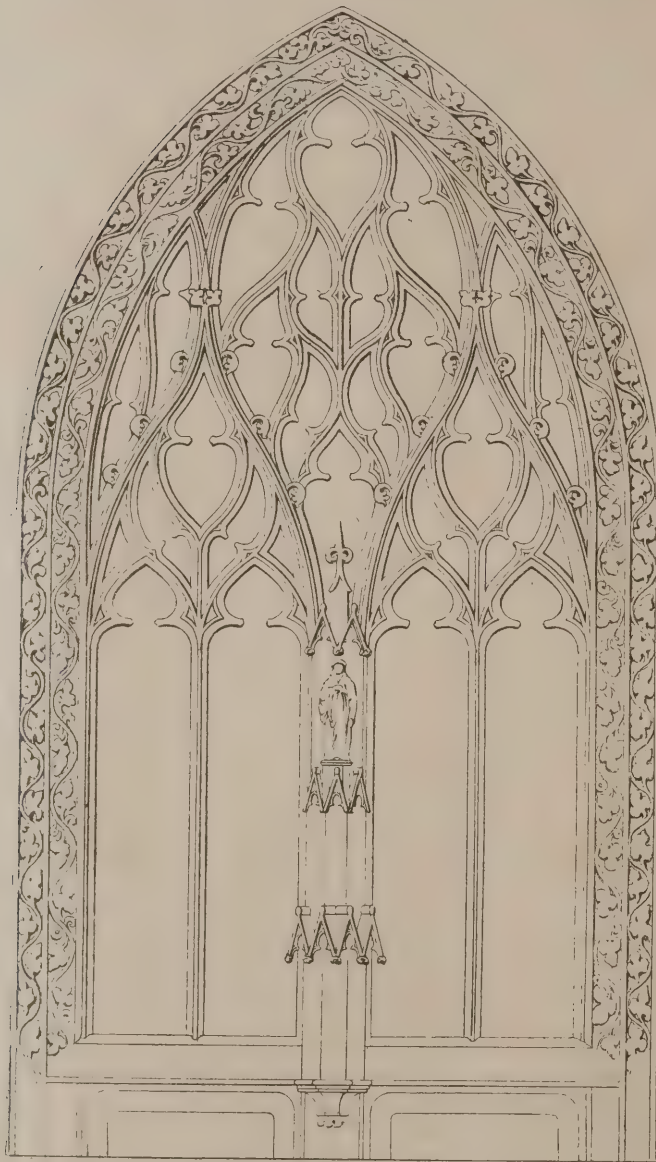
more prevalent than in others, and an illustration in point may be taken from the steeples about Caen and in other parts.

Those of Norman date had in some of the stages several compartments of panelling, of which the alternate ones, or if four the two middle ones, were pierced for windows; these were often, if the steeple was lofty, of a long proportion; when the next style came of course, according to the usual character of that style, they were lengthened, and when the Decorated style was formed these long windows continued to occur, but they were a little modified by being made very small two-lights, yet the same general appearance of these steeples was preserved by this adaptation for nearly 400 years, and so nearly is the outward form alike that it requires a close approach to discern what the real style is.

One other instance of resemblance in the details of very different periods may be found in the spires being cut in tiles or shingles; this begins very early and continues very late. This illustration will, I trust, explain my meaning, and I may also remark that in France there is much more mixture of the features of different styles in the portions of buildings that were erected at the same period than we generally find in England.

Although it is evident that the gradation in France, from the Norman style to the Early French, was carried on as in England by imperceptible degrees, yet we are not able to trace it so clearly from the continued tendency to Norman mixtures, which lasted till the style again changed to Decorated.

We have therefore in each church a greater or less mixture and very few pure buildings like our Early English in its confirmed state, and before the enlargement of windows, which marks our later buildings of that style and forms the transition to the next. Of these pure buildings we found two so very excellent that they deserve especial mention. One is the church of Norrey, near Caen, a cross church, with a lofty steeple and a circular apsis, with chapels. The other, the chapel of the Seminary at Bayeux, which was a monastery, and the buildings are mostly modern, except the chapel, which has lately been cleaned, and some restorations executed not in the best style; its beautiful porch is, however, still in a ruinous state. This chapel is a single plain-groined space, with double lancet windows. It is in character and simple beauty more like the eastern portion of the Temple Church than anything we saw. This chapel has a curious eastern termination, which will be noticed when that subject is treated of.



A FRENCH FLAMBOYANT WINDOW.
Over the Doors in the South Porch, Harfleur.

Norrey has its choir and north porch of a much richer character than the Seminary chapel, but still in its details, mouldings and foliage very pure and much like English work.

These examples, with various small portions occurring in different buildings, are sufficient to show that, although not always (perhaps I might say not often) so worked, yet that the Early French style when pure was very much like the Early English. During this transition and that to the next style many very large buildings were begun, and the Early English base of piers (the attic base worked to hold water) is as common in France as in England, if not indeed more so. During this time also the piers have varied, though not exactly as in England, yet so much so as not to require particular enumera-

tion, except in one case arising from the general plan of finishing the eastern portion of the French churches: this in very nearly every large church and a great many small ones is with a circular or multangular apse, and this rendered it convenient to use a pier very seldom. If ever used in England that is a double column engaged in each other, the plan forming a figure of 8, one shaft to the choir and the other to the aisle. This arrangement is continued from very Early French to very late work, and at one cathedral these shafts have been fluted in modern times.

As the cathedral of Amiens is usually contrasted with Salisbury Cathedral, it will be proper here to notice the portal, or grand entrance, which forms so important a portion of most of the western façades, and in many of the transept ends, of the larger French churches. They have in most instances the centre doors double, and in far the greater number the head of the actual doorway is a straight line leaving a large tympanum. The sides are often very deep, far beyond almost any English Norman doors, and are very generally filled with saints of very large dimensions in niches which are continued up the sides of the arches, and thus with the tympanum, which is also often carved with statues in niches or relieved figures in groups, forming a mass of statuary which at a little distance becomes confused, and the straight line at the head of the door having above it other straight lines of figures, the whole has a very unsatisfactory appearance from the arches being abruptly cut by these straight lines. This mode of ornamenting the portals began about 1200, and continued more or less to the latest period, but not to quite so great an extent in the Flamboyant style, as some of the transept doors of that style are not so overpowered with statuary.

It may be well to remark that the nail-head and toothed ornaments, though found in France, are by no means so abundant as in England; there is, however, a great similarity in the style of carving at the same date in both countries.

The enlarged windows, which led on in both countries to the Decorated style, appeared apparently at an early period, as parts of Amiens have real Decorated windows, but it is not absolutely clear that they are so early as the walls, for many practical reasons might occur to defer the windows—the tracery at least—till a later period. However this may be, there seems to have been a rather abrupt assumption of windows with geometrical tracery, much of which, from the large size of the churches, is very beautiful, and very soon appeared the glory of the French large churches—their magnificent wheels. In this particular we cannot compete with France. I am not certain that we have twenty wheel windows in England which for size and tracery can well be named, while in most of the cathedrals in France there are one, often two, and sometimes three, and they are of all dates, from Early French to the latest Flamboyant, and from their size are often very elaborate, and many of their large windows have wheels of very rich character in their heads. The advance of flowing tracery not Flamboyant does not seem to have taken place in France so completely as in England, the tracery continuing apparently longer of a geometrical character, and then almost at once becoming Flamboyant.

As there appear to be few pure Early French buildings, there appear to be as few pure Decorated ones—that is, buildings the style of which is without a tendency either backwards or forwards—but there are many portions, and one chancel of a small church, Tour en Bessin, near Bayeux, is so beautiful, and so completely harmonises with our best English Decorated work, that it deserves especial notice. It is a cross church, the nave Norman, and the aisles destroyed and the arches built up, a central tower and transept. The tower and spire seem earlier than the chancel, which has very large windows above a lofty arcade. In this arcade (now very much mutilated and part converted into cupboards and shut up) there have been two rich piscinas and three stalls. There may have been more stalls, but they are not now visible. Above this arcade a band of quatrefoils ran under a cornice and pierced parapet, with a passage between it and the windows. The chapel is beautifully groined, and has had a south door, the outside of which remains. All this work is of the purest character, and the mouldings bear a great analogy in character and combination to some of our best English Decorated work.

This church renders it necessary again to revert to the finishing of the east ends of large and small churches. After 1200 it appears during the prevalence of the Early French style to have been not uncommon in smaller churches to have the east ends flat, for we found many country churches with three lancets and a flat east end, but of these nearly all were stopped. A few east ends we also saw with Decorated windows at the east end, and the end flat. One large church in a town (Louviers) between Rouen and Evreux, the date of which is known to be 1218, had originally a flat east end and lancet, but now has a plaster addition to make a sort of circular apsis.

As a curious sort of intermediate finish of the east end, the chapel of the Seminary at Bayeux and this Decorated chancel

at Tour may be cited, and I know not that we have anything like either of them in England. The first is easily described. At the east end one shaft rises in the middle and another behind it, then on each side of this shaft a recess, being three sides of an octagon, is formed, thus giving a singular and very beautiful finish, and still more beautiful groining, to the east end. I suspect this east end had originally two altars.

At Tours another and much more elaborate composition is exhibited. Here we have the east end divided into three arches, the middle one containing a very fine five-light Decorated window, and each side arch having three sides of an octagon outwards, two of them with two-light windows and the other with a one-light window, all with good and varied Decorated tracery. The arcade, which is inside the side windows, also runs inside of these polygonal portions, and is separately groined from its own shafts, and then the principal space again groined; the intricacy and beauty of this roof altogether I have seldom seen exceeded. It is not easy to describe this in words, but I trust a plan of the groining will make it clear. The choir of St. Ouen at Rouen, and some parts of the transepts of this church and the cathedral, exhibit fine specimens of the French Decorated style.

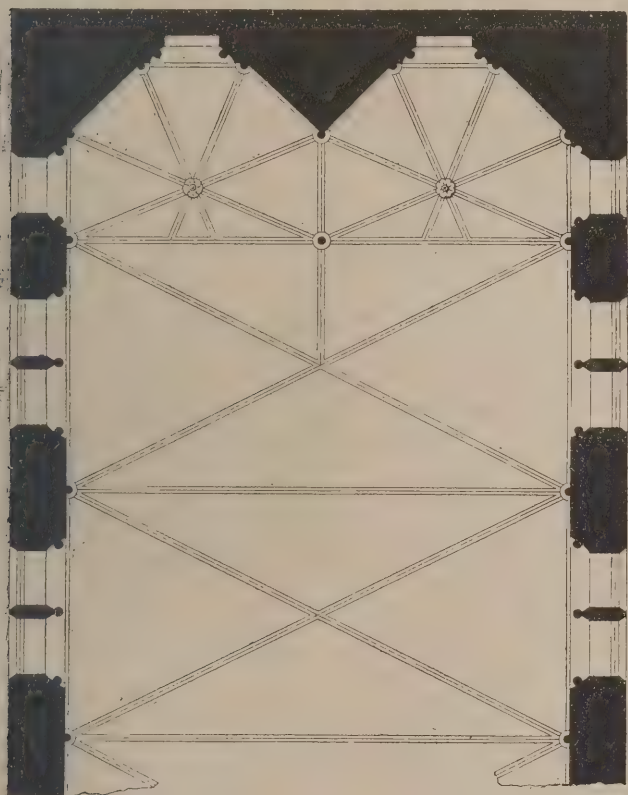
It may be proper here to remark that the cathedrals of some of the southern parts of France have various portions and combinations strikingly recalling their vicinity to Italy and the modifications thence arising; but this subject belongs to that

Early English work, and is continued and used indifferently with the trefoil to the latest time. In France, though it cannot be said the cinquefoil is never used, yet the trefoil is so constant that cinquefoiled examples are very rare.

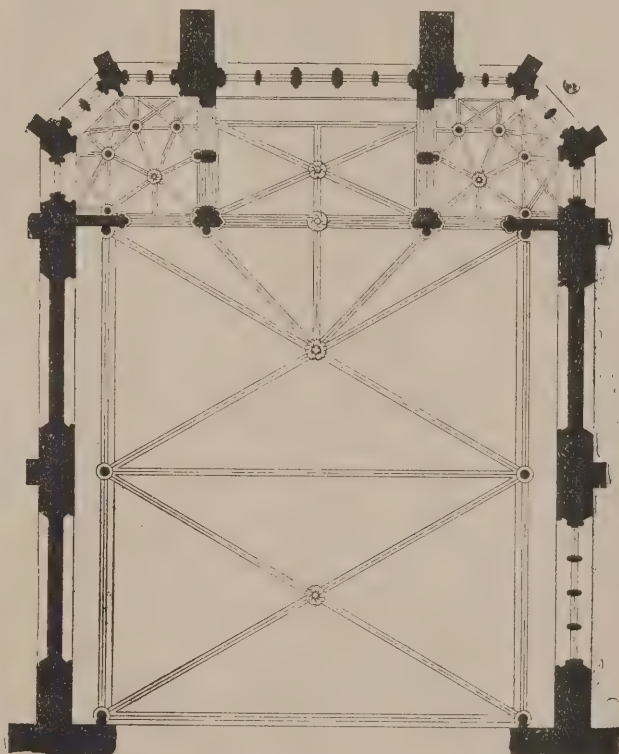
In many of the large churches, such as the cathedrals of Amiens and Rouen, and the church of St. Ouen at Rouen, and at a few other places, the triforium is glazed as a window, and being in these instances large and lofty and filled with stained-glass, has a very fine effect.

Of the stained-glass I may say that it is astonishing that so much has been saved as is still remaining, and its quality is mostly very good indeed. A careful examination with a good telescope is (from its distance from the eye) essential to a proper appreciation of its value.

I have said little of the minor adjuncts—screen-work, wood-work, &c.; but I may here mention that the cathedral of Evreux alone contains a complete mine of beautiful enrichments and tracery in wood screen-work, and in iron locks, handles, &c. The beautiful shrine of St. Taurin in that city is a complete silver-gilt cross chapel, of the best Early French character and most admirable execution and considerable size, being about 5 feet long, 2 feet wide, and 3 feet high, having many fine figures appearing in the arches, and beautiful foliage in the crockets, &c.; if executed in stone as a chapel it would make a very fine building. Other edifices contain portions of screen-work, &c., of great value, and I believe some at



CHAPEL OF THE SEMINARY AT BAYEUX.
Plan of the East End and Groining.



TOURS, NEAR BAYEUX.
Plan of the Chancel and Groining.

more minute view of each style which I propose to take hereafter.

Before proceeding to the last or Flamboyant style, it is right to notice the continuance nearly through all the styles of that most simple mode of groining which, with us, is characteristic of the Early English style; and I think this is easily accounted for by the greater height, not only actual, but proportional, in the French edifices, which rendered useless the elaborate groining of our lower proportioned churches, for the carving of the bosses, with us so beautiful, would be utterly lost at the distance and the angle it would be seen at in French churches. That the French architects did it from choice is evident from the occasional use in proper places—small chapels, niches, &c.—of very elaborate and beautiful groining, but I do not recollect seeing any real fan tracery, though some roofs have pendants.

It may be well here to notice two singularities which run through all the later French styles: one is the absence of all battlements, properly so-called, whether real as parapets, or ornamental in buttresses, niches, &c., where they are so frequently used in England; instead of them we have a profusion of pierced parapets of elaborate composition. The other ornamental difference is in the feathering or cuspidation of arches in tracery, &c. In England, although the earliest feathering is generally a trefoil, yet the cinquefoil is used in

least of the silver utensils, crosses, lamps, &c., are of ancient date.

I now proceed to the last, or Flamboyant style. Like our Perpendicular style, it seems to have come out nearly at once, as we see very little transition from Decorated to it, though the nave of St. Ouen is such in some degree, but perhaps in a greater degree an adaptation of the latter style to the character of the choir.

Like the Perpendicular style, its piers are often without capitals, the mouldings running into the arches; like the Perpendicular, it has a variety of bases to its piers and also a variety of small buttresses to its niches, and it has also that interpenetration of mouldings and piers with bases, taking one set of mouldings and missing another, which is so common in the English Perpendicular. It has its mouldings flattened and with large hollows, like English later work; but with these points the agreement nearly ends, and the styles are in other points curiously contrasted. Although the Perpendicular style admits of great richness, we find it often worked very plain, yet retaining all the real character of the style, while plain Flamboyant seems very uncommon in France.

Its essence seems to be elaborate and minute ornament, and this continues till the forms and combinations are sadly debased and a strange mixture of Italianisms jumbled with it. Its combinations in the earlier part of the style for richness,

elaborate ornament and magnificent design are admirable, and no one can visit Rouen, where there are many churches still used and others now desecrated, and contemplate leisurely the beautiful church of St. Maclou, without feeling the value of the style, and also the value of that fine stone which seems to have encouraged the Flamboyant architects to vie with each other in elaborate decoration. The portals of Abbeville, Beauvais, St. Riquier, Evreux and of St. Maclou at Rouen, parts of Caudebec church and various other churches, are some of the finest specimens of this style.

Some of the towers of this style are very fine, but too often mutilated, and the spire of one of the western towers of the cathedral of Chartres may also be mentioned as a fine specimen. I might add Harfleur and some other smaller churches.

The combination of tracery called Flamboyant is not easy to express in words, and we have very little like it in England. An example or two exhibited will be the best explanation.

As in England, during this style a material alteration took place in the arches of doors, windows, &c., and in the same direction, viz. to become flatter; but it is curious that it took an entirely different direction. While the English four-centred arch kept getting flatter and flatter, till it became a mere turn for the small arch and a straight line for the larger one, it still preserved a point, and, even when flattened so as to rise only a few inches, still preserved its character. Of this arch I can find no distinct trace in France, though I will not say it does not exist, but its French companion, the flattened arch of the Flamboyant style, which is used as much as our four-centred arch, is a very simple one, consisting of an absolute straight line in the centre and the angles rounded off with a quarter circle, giving more or less height to the arch as the radius of the quarter circle is greater or smaller. In domestic work the aperture often becomes a straight line with a drip or other ornamental moulding or canopy over it. This style is exhibited in wooden domestic work in many parts of France, gradually adopting more and more Italianisms till they overpower all traces of Gothic.

In churches it is not so easy to trace the debasement, but parts of some churches at Caen show it clearly.

Of the details of this style I have little more to say; but I must notice two very disagreeable piers which are not uncommon in this style. One is a series of eight hollows and eight rounds without fillets; this pier has a capital to each round, but it looks very poor and meagre from the want of fillets. It is used at Beauvais and some other places. The other is a plain round pier with no capital, but the mouldings jumping out of the pier side, as if they had been soft and the pier stuck up into them. I know not that we have anything like these in England.

I have heretofore noticed the very capricious omission and insertion of the drip moulding in all the French styles, and both inside and out. In England the nature of the material, or some other apparent reason, occurs for this omission; but in France, I can discover no law or local reason for its use in some instances and its omission in others. I may also notice that the flat character of the primitive Norman arch faces, with perhaps a large bead for the only moulding, continues to appear to a late date, and in some degree to operate till the two hollows of the Flamboyant style supersede that flatness.

From the very great height of the large churches this character will be little noticed; but a good telescope (which is especially required to see many things in the French churches) will soon discover the absence of those rich suits of mouldings so common in the arches of our large churches.

As one more characteristic of the Flamboyant style may be noticed the use of a small number of very large crockets in the canopies of large portals; the effect produced is very fine, but very different from any of our Perpendicular combinations.

There are many more remarks I have to make on the minutiae of the progress of architecture within my assigned limits, both in England and France, but I must reserve them for that comparison, style by style, which I propose, if favoured with health, to make more at large; but I hope I have said enough to induce those who have time and opportunity to study the styles of architecture in different countries, not as contradictions, but as members of the same family with local differences.

If this is done with a basis of extensive English knowledge (for I still think that in England will be found the most clearly marked features of each style in its purity) then will every succeeding essay, giving details of buildings in any part of Europe, be eminently useful, and lead the way to what is much wanted, a general statement of the progress of architecture in Europe; and why may this not hereafter enable us to acquire some systematic knowledge as to the Mohammedan and Hindoo buildings, to which we are but strangers at present?

It will give me great pleasure if any member of the Society who has visited other parts of France, which I have not, would give some account of what he has found there.

(To be continued.)

DUNDEE INSTITUTE OF ARCHITECTURE.

THE Dundee Institute of Architecture, Science and Art held a meeting in the hall of the Young Men's Christian Association. Mr. William Mackison, F.R.I.B.A., burgh engineer, &c., president of the Institute, in the chair. The competitive works submitted by various students were exhibited and examined, and the Council's decision thereon was confirmed. Mr. Archibald Campbell, Albert Street, Dundee, received an honorarium for his sketch of a fountain and of the interior of St. Paul's Episcopal Church. He was the only competitor in Classes 3 and 4. Mr. Thomas Ross, jun., St. Peter Street, was awarded a prize for his sketch in water-colour of *Gladiator*, and Mr. William S. Dick an honorarium for his sketch in black and white of *Venus of Milo*. Both sketches were from subjects in the Dundee Art Museum of Casts. In Class 8, for architectural or geometrical drawing by artisans, an honorarium was awarded to each of the three competitors, their work being all alike good. In Class 9, for design for lodge and gateway, Mr. D. W. Galloway, Ramsay Place, Broughty Ferry, secured the prize, and Mr. John R. Barbour, The Beeches, Blairgowrie, an honorarium for merit. The President was thanked for his addition of 10s. 6d. to the prize fund. The following gentlemen were nominated as office-bearers for the ensuing session, viz.:—President, ex-Bailie Keith; vice-president, Mr. Leslie Ower; members of Council, Bailie Foggie, Messrs. G. G. Maclaren, William Briggs and William Nixon; honorary secretaries, Messrs. J. J. Henderson and G. Jamieson; honorary treasurer, Mr. R. Hunter, and auditors, Messrs. Thomas Cappon and James Hutton. An invitation from the President and Council of the R.I.B.A. to the President of the Institute to attend the proposed festival dinner in London on July 2 in celebration of the first general meeting of the Royal Institute on July 2, 1834, was submitted and the hope expressed that Mr. Mackison would be able to attend, and that he might be accompanied by other professional brethren from Dundee. Proposals for additions to the rules, to be decided at the annual meeting in June, were submitted, and the Council was requested to draw up proposals for the revival of rules to the first meeting of the Institute next session. The thanks of the Institute were awarded to Messrs. J. G. Orchar, A. C. Lamb and C. Ower as judges in the competition. A vote of thanks to the chairman terminated the proceedings.

DESIGN AND BUILDING.

A WRITER in the last number of the *American Architectural Review* says:—

Mr. Norton has told us what, in all honesty, we hardly needed to be told, that our modern design is lacking in fine sensibility, in repose; it is too self-assertive, too personal, too self-conscious. Now we know perfectly well that this is true. We are self-conscious in our work. It is the rarest thing in the world to find a modern building of any importance that looks, for example, as our ideal of a gentleman should look—unaffected, intelligent and unburdened with any sense of his manner or outward appearance.

There is a very rational explanation of this condition we think. We would trace it through the analogy just introduced. The man whose manner of carriage and conversation seems most sympathetic and agreeable to us is not thinking of his manner, but of us, or his subject, of the thing he is doing. His mind is centred on something far remote from the impression that he is making. It is this unconsciousness of his outward effect that gives it its peculiar charm. Put it the other way, and remember any man you know who is always thinking about the effect he is producing on you by his conversation, or his manners, or clothes, and it is easy to see how invariable is the rule that unconsciousness of self is a grace.

Every one who designs knows how much more charming is some little sketch made hurriedly for the purpose of working out a tentative idea than any drawing he is able to make from his finished work. In the first sketch his mind is on the idea itself; in the second he thinks of his drawing, and the consciousness that his drawing may be criticised mars it.

General Grant wrote his book in his plain, straightforward fashion of executive man, and produced, unawares, a great piece of literature.

Lincoln, with countless cares filling his mind, went to Gettysburg and jotted down his immortal address on the back of an envelope in a train.

These heroes of our war were not thinking of a literary greatness when they wrote. Their hearts and minds were full of issues far greater than the form their utterances was to take, and because their interest was not in their form of expression, their form of expression was full of interest. This paradox was enunciated long ago by one who said, "He that loseth his life shall find it." It receives its practical illustration in the acknowledged fact that the architects of all the most truly beautiful buildings of the world before the Renaissance were

not architects but builders. Architecture as an art did not exist, although building did. In those days builders produced architecture; to-day, architects produce buildings. We cannot begin to rank our average production with their work, considered as art. Their work has invariably that serene air of unconsciousness which is so conspicuously lacking in ours. Moreover, they possessed that indefinable perception of the shades of expression which constitutes so large an element of art. Their work, indeed, has furnished Mr. Norton with the very basis of comparison which he exercises against ours.

Now the essential point of difference between the relation the designers of those buildings had to their work and the relation we hold to ours is that they built it, whereas we only design it. Apparently it was this fact that made their design better. And we find, from what we have just been considering, that this seems only a natural conclusion. The master workman responsible for the construction of a cathedral had something to occupy his mind far more absorbing to him, we do not doubt, than the correction of details of arch mould and capital. And it was partly because of the mental discipline this responsibility entailed upon him, partly because of his familiarity with his tools and material, and the actual fall of light and shadow, that he could proportion and mould and carve the various parts of his work with that freedom from all affectation which is the crown of art. Preoccupied with the structure, stability and general rightness of his building, his expression was natural and unconscious. His conscious thought went into building, and of the mode of his expression he thought as little probably as Grant and Lincoln.

In the separation of the provinces of designer and builder, then, seems to lie the cause of the poverty and meanness of our design on the one hand and its pompous pretension on the other. We can trace the evidence of this historically. The trouble began with the rebirth in Italy of the art of old Rome—an art which we know to have been conspicuously false in principle and meretricious and vulgar in detail. Then was established the custom, that has since obtained, of borrowing and not earning an art. This vicious principle has so corrupted our integrity of mind that it is now hard for us to appreciate that such a process can only result in bankruptcy. But every natural parallel and analogy shows that it must be so, and the vacuity of our work, had we eyes to see it, adds the certainty of actual proof to the deductions of our mind.

Having thus outlined what we believe to be the fundamental cause of the degradation of architecture since the time of the Renaissance, let us consider some of the more specific phases which confront us, and which seem to offer an obstacle to better work. For it will be found in practice that if conditions are to be bettered, the initiative must come from ourselves, and the first step in the education of those who follow us must be taken in our own self-enlightenment.

One element in the non-appreciation of architecture as an art by the public is our trades unionism in charging a level price for the services of all. We claim that there is a difference in value between the work of an artist and the work of an ignorant bungler; but we give the lie to that claim when we agree together, as in effect we have, that the worth of our services shall be measured by the cost of executing our designs. This is about the same as saying that the painter of pictures should be paid according to the value of materials put into the picture. Now, whoever it was that established this ingenious and easily reckoned rule of payment, it is certainly we that consciously continue it by promulgating an authoritative schedule of charges sanctioned by the mass of the profession. In the face of this product of trades unionism, individual freedom of action is well-nigh impossible. Meanwhile it presents the most conclusive testimony that we could offer to the public that we ourselves do not consider architecture to be an artistic profession.

Bound up with this unfortunate condition are others, equally unfortunate and adverse to our working as artists. The outcome of them for the draughtsman, whose education is chiefly acquired in our offices, is a training of the worst kind.

We have suggested above that the fine perception of the designer in the times when building art was good came to him as a result of his intimate acquaintance with the material he was designing in and the conditions under which his work must be seen. We would like to develop this idea a little more fully.

There was a time when the arts as such did not exist. Before the Renaissance there were no fine arts, and in some remote time even the large class of occupations known under the humble appellation of arts (without a capital) were not set aside in a group, but were included among the common acts of everyday life. From such low and modest beginnings has the bewildering luxuriant growth we know to-day as art been slowly and laboriously evolved. Like every evolution, its principle of growth was a selection of what was used because of its practical fitness.

The primitive cup of a folded leaf gave place to the wooden bowl, and the wooden bowl to the earthen one, because of

greater permanence and fuller service. In like way the potter's wheel superseded the purely manual moulding of vessels because of its better service. The lip was formed and the bottom pointed or flared into a base for better service. If a man would claim his own, it must have some individual mark that he could recognise—some indication or token to distinguish it. And so ornament grew—for better service. And as the forms and shaping and decorative markings had their origin in the practical needs of the occasion, so each manner of working took its suggestion from the material in which the work was done. Through their lifelong bond of intimacy the material told its secrets to the artisan, and taught him how to handle it with the minimum of effort and the maximum of effect.

The fact is it is the material which develops the artisan, rather than the artisan his material. The capacities and nature of the one are inflexible and unchanging, whereas the other is easily moulded. This is another paradox. The man works to shape and mould his material, but is himself more shaped and moulded by it than it is by him. Man the savage came under the several influences of the simple materials from which he sought definite service. Little by little they worked upon him, establishing the limits of the path in which he must walk, turning him back now on the one side and then on the other from effort that would be profitless and vain, teaching him by experience the true line of progress, until, through the inherited knowledge acquired by ages of tentative efforts, he has gained a thousand highly-developed faculties to the one he had before.

Thus the artist is the product of his work in a far deeper sense than the work is the product of the artist. It was the contact with the iron which gave the Mediæval smith the power to design his beautiful work; it was the contact with the stone that taught the master builder his perfect sense of proportion in form; it was the contact with the life he expressed that gave Phidias the power to stir us to enthusiasm; it is the contact, in fine, with the real, the absolute, the natural, that makes the artist.



Old Edinburgh.

SIR,—I notice in your appreciative reference to the new part of the Edinburgh Architectural Association Transactions that you credit me with the authorship of the article on "Old Edinburgh" as well as of those to which my name is prefixed.

Will you give me the opportunity of stating in your columns that the late Mr. John McLachlan was the author of this very interesting record of old Edinburgh architects and architecture?

The earlier portion of his paper will be found in the previous part, together with a plan of old Edinburgh, prepared by me, which not only illustrates that paper, but bears as well on the articles on the city walls.—I am, faithfully yours,

G. S. AITKEN.

Edinburgh, 49 Queen Street : May 22, 1894.

Consul Smith of Venice, and Canaletto.

SIR,—Will you allow me to protest against your remarks about Joseph Smith in the article on Canaletto published in to-day's *Architect*. You say, "The English consul, Smith, was one of the earliest to perceive the artist's genius and to profit by it. He posed as a patron of the arts, but he was one of that class of dealers who are the most exorbitant, for he charged for the sacrifice he underwent in parting with a treasure." It might easily be supposed from the words that Consul Smith was degrading his office by his traffic in works of art. Now it is well to remember that at one time there was little restriction of a representative in making money so long as he did not sell the secrets of his Government. Lord Elgin was an example. It was charged against him that he induced the Grand Turk to believe that the concession to remove the Parthenon marbles was asked for by England, and was a part of the price for the protection given to Turkey. Yet the British Government made no objection about paying Lord Elgin for the sculpture, and the value was ascertained on commercial terms. Sir William Hamilton was another ambassador who bought and sold vases and other Etruscan, Greek and Roman antiquities. I am not eager to consider the commercial side of diplomacy; all I need say is there are numerous examples which prove that Smith was not considered as lowering his office when he bought pictures from Canaletto.

It is an everyday experience that painters who are glad to sell their works at any price afterwards look on themselves as the victims of those who gave them a helping hand when they were young and not famous. That Canaletto was at one time most grateful to the English consul is evident from the dedication plate he etched, and which is a permanent record of his

indebtedness to the "illustrious Joseph Smith." The consul was trusted by his countrymen not only for his probity but for his wide knowledge of books, pictures and antiquities. The unique collection of rare books which was presented to the nation by George IV., and is known as the King's Library in the British Museum, was mainly obtained by George III. through Consul Smith. Where is the young foreign artist who would not look on the patronage of so influential a man as one of Heaven's blessings? There is no record of any unfair or miserly transactions on Smith's part, and, as far as we can judge, he never concealed Canaletto's ability, but exerted himself to make the artist the "rage" in England. But, as the poet says,

Lowliness is young ambition's ladder,
Where to the climber-upward turns his face;
But when he once attains the utmost round,
He then unto the ladder turns his back,
Looks in the clouds, scorning the base degrees
By which he did ascend.

Canaletto was indebted to Smith, but when he reached a height through the help of his patron he tried to make out that, if it were not for Smith's trickery, he should have reached the summit unaided, and years before. It is not Italian artists alone who are prone to that way of paying debts.

How different was the conduct of Goethe. In 1786 he visited Italy, and as his object, as always, was his own culture, he wished to be provided with a copy of Palladio's designs to enable him to appreciate modern Renaissance architecture. Having obtained a copy he wrote home:—"At last I have acquired the 'Works of Palladio.' It is not the edition that I saw in Vicenza with woodcuts, but an exact copy, a facsimile in copper, produced by an excellent man, Smith, the former English consul in Venice. We must give the credit to the English that they at all times know how to treasure what is good, and have a grandiose manner of disseminating it." Afterwards, when he arrived in Venice, he made a dutiful pilgrimage to Smith's grave. In his letter he says:—"On the Lido not far from the sea the English lie buried, and further off the Jews, for neither race is allowed to repose in consecrated ground. I found the grave of the noble Consul Smith. To him I am indebted for my copy of Palladio, and by the side of his unconsecrated grave I thanked him for it. The grave is not only unconsecrated, but half-overwhelmed. The Lido is only a sort of dune; the sand accumulates and is blown hither and thither, heaped up and compressed. In a little time Smith's grave will be hardly recognisable." Goethe was too noble a genius to trouble himself with speculations about the profits which Consul Smith made out of the Palladio. He accepted Smith as a man who obtained a chance to do good to his contemporaries as well as posterity, and was not neglectful of it. For, as Goethe said on another occasion, "Let everyone only do the right in his place, without troubling himself about the turmoil of the world (which, far or near, consumes the hours in the most unprofitable manner), and like-minded men will soon attach themselves to him, and confidential interchange of thoughts and growing insight into things will of themselves form ever-widening circles—"

Damit das Gute wirke, wachse, fromme,
Damit der Tag des Edlen endlich komme."

Joseph Smith of Venice was not the only man of his name who toiled in that way—Your obedient servant,

ONE OF THE SMITHS.

London: May 18, 1894.

The Art Union of London.

SIR,—My attention has only just been called to a statement in *The Architect* of May 11, with reference to this Society and its recent appeal against assessment for rates, and as your paragraph contains an important misstatement of the judgment given in this case, and one likely to create a very injurious impression with regard to the Society, I shall be obliged by your inserting a correction in your next issue. Your paragraph states that the Art Union was declared to be "an unauthorised art lottery," whereas the words used by Mr. Justice Wright, as taken from the shorthand note, were, "To my mind it appears that this institution is now in substance—I do not use the words offensively at all—an authorised art lottery."

This Society conducts its operations under a royal charter granted specifically in pursuance of the Act for legalising art unions, and any departure from the provisions of that Act would very soon be interdicted by the Board of Trade. The *Times* newspaper, in their first report of the case, made a misstatement, but which was corrected in their issue of May 10.

I shall be glad of your assurance that this matter will have your immediate attention.—I am, faithfully yours,

R. W. F. HARRISON, Secretary.

[The "Note" to which the Secretary refers expressed the legal aspect of the case as far as it could be done in the briefest

terms, and certainly without any intention of creating an injurious impression. The words of the learned judge are guarded, and if litigation arose we presume they would not be accepted as a warrant that the Art Union is in every circumstance an authorised art lottery. The Council also must have a misgiving of the kind, especially after the result of the appeal case; otherwise they would hardly refer to the inaction of the Board of Trade, a department that at one time was supposed to aid in the promotion of art. If an individual were to take action against the Art Union, which we do not advise, the plea of tolerance by the Board would not be of much avail. The judgment in the recent action makes it plain that the position of the Art Union has been misunderstood, and as it possesses no privilege in respect of local rates and taxes, so on inquiry it might be found that it was vulnerable in other matters. The Council will do well to consider whether it is not possible to obtain more security, and in that way increase the efficiency as well as the stability of the Union.]

GENERAL.

The Directors of the Maidenhead Commercial School Company have selected designs for schools in competition by Mr. Stephen Salter, jun., F.R.I.B.A., of Isle of Wight and Maidenhead (Davy & Salter). The same architects have consented to act as honorary architects for the proposed Maidenhead Public Library.

The Keighley School Board have decided to invite plans in competition for a new school for 500 children and 200 infants.

The Alexandria Archaeological Society have resolved to issue a protest against the proposed submersion of the Philæ temples in connection with the Nile reservoir scheme proposed by the Irrigation Department.

Plans by Messrs. Essex, Nicol & Goodman for the erection of a meat market and slaughterhouse in Bradford Street, at an estimated cost of 48,000*l.*, have been adopted by the Birmingham City Council.

A Meeting will be held in the Mansion House to-day in support of the fund which is being collected for the decoration of St. Paul's Cathedral.

Mr. R. W. Gibson, architect, has been successful in the competition for the Clearing House Association's new building, New York, of which the estimated cost is about 300,000 dols.

Mr. W. J. Woodhouse has obtained the Conington prize for 1894 by his dissertation on the geography, topography and antiquities of Ætolia.

The British Commissioner-General has announced that the final day for receiving goods at the Antwerp Exhibition would be the 26th inst., and that any space then unfilled would be declared forfeited by the Belgian authorities.

The Design of Mr. Ernest Flagg for the Washington State Capitol, to be erected at Olympia, has been accepted. There were 189 competitors. Professor Ware, of Columbia College, the consulting architect, made the selection. The building is to be 300 feet by 150 feet, and is to cost 1,000,000 dols.

Christ's Hospital will be open for the reception of scholars on June 4, the reconstruction of part of the sanitary works having been completed.

The Annual General Meeting of the Institution of Civil Engineers will be held on Tuesday evening, the 29th inst.

Mr. E. Brocklebank has offered 1,000*l.* towards the restoration of the Radley chancel in the parish church of Bunbury, Cheshire.

The Swansea Harbour Trust have appointed Mr. Augustus Oswald Schenk as engineer to the trust at the salary of 500*l.* a year.

The "Old Antwerp" part of the Antwerp Exhibition has been carried out under the direction of M. Geefs, architect, and M. Van Kuyck, painter.

The Congress for the advancement of Christian archaeology will be held in Spalato from August 20 to 22 next.

An Exhibition of contemporary painters has been opened in Brussels. Great Britain is represented by works contributed by Sir F. Leighton, Sir J. E. Millais, Mr. Alma-Tadema, Mr. Lavery and Mr. Brangwyn.

The Bridges Committee of the County Council received a deputation of members of the art standing committee of the Royal Institute of British Architects, who desired to lay before the Council their views as to the importance attaching to the new bridge at Vauxhall as an architectural monument. The Chairman explained the numerous difficulties inseparable from such an undertaking, and having thanked the deputation for expressing its views, the latter withdrew.

The Architect.

THE WEEK.

THE removal of the houses in Poet's Corner and Old Palace Yard, in order to render Westminster Abbey more safe from destruction if a fire occurred in any of them, will be an operation which can only be regretted by the tenants. The purchase of the property was recommended by the Royal Commission that inquired into the condition of the Abbey and its capacity as a place of burial. It was intended to bring in a Bill in the present session authorising the Office of Works to deal with the subject, but owing to the facilities offered by the Ecclesiastical Commissioners and the leaseholders, it is anticipated that arrangements can be made for the acquisition of the property in a simpler way. When the site is clear, the erection of a chapel on it can then be considered under new conditions, and Mr. YATES THOMPSON may obtain a chance to display his liberality by paying for a building to shelter the remains of notabilities. It is not likely, however, that any steps will be taken for the disposal of the site until another investigation takes place.

ON Saturday last the French Académie des Beaux-Arts were occupied with the election of a member to fill the chair of the late JULES PIERRE CAVELIER. The fortunate candidate was M. LAURENT HONORÉ MARQUESTE. The new academician was born at Toulouse in 1850. He studied under M. JOUFFROY and M. FALGUIÈRE, and obtained the Prix de Rome in 1871. M. MARQUESTE obtained a third-class medal in 1874, a first-class in 1876, a second-class in 1878 and a gold medal in 1889. Among his works is a figure of *Architecture* for the pediment of the Palace of Liberal Arts, one of *Geography* for the new Sorbonne, and he completed the equestrian figure of *Etienne Marcel* which is placed near the Hôtel de Ville, Paris, and was commenced by the late M. IDRAC. Among his statues are *Perseus and the Gorgon*, *Velleda*, *Susanna* and *Galatea*.

ALTHOUGH Europeans have derived no benefit from the World's Fair in Chicago, it is to be regretted that the French Government have commenced litigation against the managers for the damage which was caused in the French section by the fire which arose after the close of the exhibition. The Americans merited to have a different sort of acknowledgment of their enterprise, for it must be allowed that in Chicago, as in the Civil War, they played for success with stakes that were remarkable. As far as can be ascertained, the exhibition cost about five and a quarter millions sterling (5,222,000*l.*). So large a sum was never expended on any of the preceding exhibitions. It was not anticipated that the money would be returned. The receipts apparently were 2,120,000*l.* from admissions, 750,000*l.* from concessions, and from miscellaneous receipts and interest 159,000*l.* A sum of more than 3,000,000*l.* had therefore to be granted or lent, and it can only be returned indirectly through the increased gains of American industries. The Royal Commissioners summarise the expense by saying that "the total outlay by the American executive upon the Chicago exhibition may be taken as about six millions sterling, of which it may be said, roughly, that three millions were earned by the Fair, two millions subscribed by Chicago and a million provided by the United States Government. Besides the above sums there were, of course, the sums granted by the various participating foreign Governments. The total of these is estimated at about 7,000,000 dols. (1,440,000*l.*)." The European exhibitions appear to be hardly deserving of comparison with the Chicago Fair. In 1851 there was a profit derived that was sufficient to buy a part of South Kensington, and yet the receipts were only 506,243*l.* From the exhibition of 1862 the receipts were 459,631*l.* The Paris exhibition of 1855 produced 128,099*l.*; in 1867 the amount was 408,530*l.*, and in 1889 the receipts from all sources, and including subsidies, reached 1,080,000*l.* Chicago may therefore claim to have set up a record which Europe is never likely to exceed.

A GLASGOW builder, Mr. JAMES PARKER, has obtained a decision which has interest for contractors, especially if it should be upheld in the superior courts. He claimed 50*l.*, or such sum as might be found due to him, from the City Union Railway Company. Large quantities of stone were delivered to Mr. PARKER by the company's trucks, and he duly settled the accounts every month. The company's agent having been dismissed for irregularities in his account, Mr. PARKER became doubtful that he was charged for an excess of weight, and having satisfied himself, brought his action. The company pleaded that the action was irrelevant, and that if the builder was defrauded they could not be held responsible. Sheriff SPENS, before whom the case was tried, does not take that view, and has ordered the accounts to be investigated so as to ascertain the exact amount of the excessive charges. He declares that where a stationmaster is entrusted by a railway company with the power of rendering and collecting accounts in connection with the carriage of goods, and he should make false statements as to the weight and induce payments to be made proceeding upon the false basis, so far as the public are concerned they are entitled to believe that the accounts so rendered are the accounts of the company and not of the individual, and for the accounts of the company the company are responsible. The plaintiff was entitled to rely on the agent acting within the scope of his authority. If the stationmaster made false returns, and in the belief they were true returns of weights builder paid carriage, the plaintiff is quite entitled to look to the company for repayment of the sums which were paid under fraudulent misrepresentations.

It was hardly wise on the part of the committee for the enlargement of St. Paul's Church, Clacton-on-Sea, to dispute the account of their architect for the preparation of plans, when the amount of it was only 79*l.* As often happens in such cases, it was necessary to get out plans that would be adapted for other works if money could be obtained for them. The committee paid 25*l.* into court. Mr. Justice CHARLES, who heard the case on Wednesday, gave judgment for 52*l.* 10*s.*, which was splitting the difference between the two amounts. His lordship also gave an opinion against the schedule rates, saying that although they had been repeatedly proved to be customary, the courts had declined to be bound by them. Mr. Justice CHARLES held that all charges by architects must be determined by what is a fair and reasonable remuneration for the services rendered in each case.

THE island of Candia, Creta, or Crete, offers one of the most tempting exploring grounds for the archæologist. The ancient traditions about the structures are likely to have had some basis of truth. Crete was the territory of MINOS, the law-giver, who had the labyrinth constructed in imitation of one in Egypt. In the history of Greek sculpture the Cretan artists DIPENUS and SCYLLIS appear among the earliest creators. The island must have been often visited by Phœnicians, the great middlemen of antiquity, and, as in other places where they came, there are likely to be many proofs of their presence. The inhabitants, however, retain the qualities which gave rise to the saying, "Cretizare cum Cretensibus," and St. PAUL refers to another by one of their prophets, who declared, "The Cretans are always liars." The Government is not of a kind that promotes truth and honesty. Accordingly, several archæologists who tried to gain a footing in Crete have gone away disappointed. The only man who stood his ground is Dr. HALBHERR, of the Roman University. He was able to remain for a few years, and became well acquainted with the island. He has been allowed to return, and it is understood that he holds a commission from the American Archæological Institute. In a short time he has succeeded in obtaining several inscriptions and some pieces of sculpture that were apparently produced after the island had become a Roman province. He has also made some progress towards insuring the safety of the immense Gortyna inscription, which is a legal edict that is of much importance to others besides students of ancient laws. It will be necessary to remove the wall containing the inscription in order to set up the masonry in the museum at Candia.

ARCHITECTURAL ESSAYS.*

LIFE is daily becoming more of a scramble, and an architect cannot help aiding and abetting those who insist on the excitement. His clients as a rule wish to have their buildings constructed or "run up" with the utmost despatch, and to gain that end they are quite prepared to sacrifice many things which in a happier or a more leisurely age would be considered essential. Where is the manufacturer who prefers refinement of detail in a warehouse to the opportunity of displaying the novelties of the approaching season to retailers and agents a couple of weeks earlier than his competitors? The majority of secular buildings are of late years built in a hurry in order to meet transient occasions, and as new churches are supposed to be demanded by most urgent needs, they have also to be completed within a definite and very limited time.

It would be considered absurd if the cottons, muslins and other gear were compared with the dress materials of an earlier time, and indeed people have been taught by sad experience to believe that modern products (not excluding sermons) are only to have a brief duration, as they are intended to serve temporary purposes. But the buildings containing the products are not allowed to be useful on those terms. They are compared with others which were intended for a different purpose, and were designed and erected with the deliberation which men considered should pertain to an architectural work.

The critics who enter on that sort of comparison are often architects, and their criticism is to be taken as an expression of discontent with their lot. It is not agreeable for a man who is eager to reflect over his design, and to wait for inspiration until he can do justice to himself, to be compelled to have it ready within a prescribed number of days or hours, or it will be useless. He knows, too, that his hurried efforts must be considered as irrevocable. Happy thoughts will come to him, and he would be glad to embody them in his design, but the builders are too expeditious in their arrangements to allow any opportunities for alterations. Need we wonder if at such a time an architect will try to console himself by brooding over the happier times in which his predecessors practised?

The interesting volume by Mr. HENRY VAN BRUNT is an expression of that discontent to which the conditions of modern practice occasionally give rise. With one exception the Essays were not prepared for publication as part of a book; indeed, one could hardly expect the murmuring of a busy architect to take that form. They all, however, have so much in common, we may easily suppose they originated from one cause, especially when we are told that "they have been developed rather from practice than from theory." Mr. VAN BRUNT, like so many architects in England, believes the architectural state is out of joint; he does not presume to say he was born to set it right, but he thinks it will do no harm if he contrasts its present state with what it was when the strains upon it corresponded with its character.

The first essay on "Greek Lines" presents that contrast as it appears from one point of view. It is wonderful that so much subtle grace should be imparted by Greek masons to blocks of stone, and apparently for the purpose of gratifying their own desire for beauty. Lines which were supposed to be straight have been discovered to be delicate curves, and curved lines baffle inquiries about their creation. The plates which PENROSE, PENNETHORNE and other inquirers have prepared are of surpassing interest, but we cannot suppose that the elaborate process that they present for the analyses of the curves was employed in setting out the contours. The Greek must have used means which are unknown to us. The volutes which the geometers and the drawing-masters teach us to construct do not correspond with those of the Erechtheum. A similar failure happens with most of the curves. In our time the majority of people are satisfied with curves of the simplest sort: a part of a circle serves as well as part of an ellipse or parabola. To many students it is, therefore, difficult to believe that the Greeks could have gone through so much trouble in the creation of curves merely for the gratification of the eye. Mr. VAN BRUNT, for instance, takes a Greek S and a

Roman cyma reversa, or semi-lemniscata, and contrasts them with one another and with the vertical line, which is supposed to be an emblem of Egyptian art. Among his observations on the Greek curve are the following:—

I have endeavoured in the representative line which I have traced to embody the characteristic grace of the delicate and elegant lines in the profiles of Greek mouldings and vases, and to present a type of the restrained and carefully-balanced rhythmic movement, the aristocratic poise, which distinguish the composition of Greek ornament. It is impossible to produce this line in that easy and thoughtless curve which Hogarth, in his quaint "Analysis of Beauty," assumed as the line of true grace, nor yet are its motions governed by any cold mathematical laws. In it is the earnest and deliberate labour of love. There are thought and tenderness in every instant of it; but this thought is grave and almost solemn, and this tenderness is chastened and purified by wise reserve. Measure it by time and you will find it no momentary delight, no voluptuous excess which comes and goes in a breath, but there is a whole cycle of deep human feeling in it. It is the serene joy of a nation, and not the passionate impulse of a man. Observe from beginning to end its intention is to give expression by the serpentine line to that sentiment of beautiful life which was the worship of the Greeks; but they did not toss it off like a wine-cup at a feast. They prolonged it through all the varied emotions of a lifetime with exquisite art, making it the path of their education in childhood and of their wider experience as men. All the impulses of humanity they bent to a kindly parallelism with it. This is that famous principle of Variety in Unity which St. Augustine and hosts of other philosophers considered the true ideal of Beauty. Start with this line from the top upon its journeyings; look at the hesitation of it ere it launches into action; how it cherishes its resources and gathers up its strength!—with a confidence in its beautiful Destiny, and yet with a chaste shrinking from the full enjoyment of it, how inevitably, but how purely it yields itself to the sudden curve. It does not embrace this curve with a sensuous sweep, nor does it, like Sappho, throw itself with quick passion into the tide. It enters with maidenly and dignified reserve into a new life which, as you glance at it, seems almost ascetic, and reminds you of the rigid fatalism of Egypt. Its grace is almost strangled, as those other serpents were in the grasp of the child Hercules. But if you watch it attentively, you will find it ever changing, though with subtlest refinement ever human, and true to the great laws of emotion. There is no straight line here, no death in life, but the composure of "maiden meditation" moving with serious pleasure along the grooves of happy change. It certainly does not seem to be merely fanciful to attribute the character of this line to a habit of chastity in thought and of elegant reserve in expression. Follow it still further, and you will find it grateful to the sight, neither fatiguing with excess of monotony, nor cloying the appetite with change. And when the round hour is full and the end comes, this end is met by a Fate which does not clip with the shears of Atropos, and leave an aching void, but fulfils itself in gentleness and peace. The line bends quietly and unconsciously towards the beautiful consummation, and then dies because its work is done.

Every one who is able to appreciate ingenuity will enjoy Mr. VAN BRUNT'S discoveries of all the relations which belong to a line that is not complex. With so much mental vision there is no doubt he would be able to find much that is remarkable in the commonest curve of a jerry-built house. But can we imagine that the Greeks were as happy as Mr. VAN BRUNT in enjoying the details of their buildings? There is nothing to show that they ever went to the curved lines for analogies. The Greeks would probably have seized on defects, and their sense of the ridiculous would have found enjoyment in any bit of a temple that was commonplace; but they were too impatient, too eager to enjoy life for meditations among tombs or masonry of any sort. EMERSON could speak about the possibility of finding the universe mirrored in a drop of dew, and that sort of intellect is apparent in Mr. VAN BRUNT'S remarks, and it becomes the more remarkable as we suppose he has had to gratify clients by displaying his speed in design at high-pressure rates.

Beautiful lines have to be subjected to laws of race, and those of the Greeks were not adapted for Roman requirements any more than for those of the nineteenth century in English towns. Mr. VAN BRUNT considers that if the lines had been familiar to the Mediæval architect, a different result would have followed. Probably the effort which was needed for the evolution of the aspiring lines of Gothic from Romanesque and Roman work would in that case have been less intense, and Greco-Gothic must have appeared as an uninteresting variety of architecture. It should not be forgotten that Greek literature and philosophy were never of much account to the churchmen who were the Mediæval teachers, for AQUINAS and the other doctors held to the matter-of-fact ARISTOTLE rather than to the sublimities of PLATO. The leading spirits of the Renaissance rebelled against that restriction, and that the Reformers agreed with them is evident from LUTHER'S

* *Greek Lines and Other Architectural Essays.* By Henry Van Brunt. Boston and New York: Houghton, Mifflin & Co. London: Gay & Bird.

thesis, "Qui in ARISTOTELE vult philosophari prius oportet in CHRISTO stultificari." Besides, how ineffective would have been Gothic if it were deprived of the power to employ the arch.

Mediæval architecture appears to correspond with Mediæval aspirations towards a better and happier world. The style is also to some extent expressive of the restlessness of modern life. But can that be said of the most faithful applications of Greek lines? There are few better examples of Ionic in London than the beautiful portico of the College of Surgeons in Lincoln's Inn Fields. But so much repose appears a mockery of the general practitioner's daily life, and of what is supposed to be the "science of medicine." It was only a few days ago that one of the medical journals, *apropos* of an application of Bishop BERKELEY'S favourite remedy, tar or creosote, announced that a new era in medicine had commenced. Can any business which is in that state, and is always liable to epidemics of new eras, be typified by a building bearing a resemblance to a Greek temple? Every congregation nowadays anticipates a change with the coming of a new rector, vicar, or pastor. Elasticity in doctrine has become a necessity. Is it suggested in the parish of St. Pancras by the copy of the Erechtheum with its rigid caryatids? The Courts of Justice, on the other hand, with all their shortcomings, at least do not appear to announce that English law is something crystallised, and formed by fixed and definite principles. As in the courts it would be hard to say what part of the buildings is dominant. A symmetrical plan is adapted for cities like Brussels and Paris, where law is codified; in London it would be an insinuation of the defects of legislation.

When therefore MR. VAN BRUNT says, "Let our artists turn to Greece; let them there learn how in our own humanity is the essence of form as a language," we would ask, Is it not wiser and better to obtain that lesson at home? Why should we pose as Greeks when we do not belong to the race? He would say the French have set us an example. They have been long engaged in the task, but they are less convinced than formerly that CORNEILLE and RACINE, with all their classicality, were wiser than the barbarian SHAKESPEARE, and the aversion to a pseudo-classicism has been one of the causes of the excesses in art which are now common in France. When MR. VAN BRUNT wrote his essay on "Greek Lines" the Neo-Grec school held sway in Paris. From that position it has fallen, and it is now believed that better models are to be found among the remains of French Renaissance. Greek lines are adapted for a people who prized architecture not only for its beauty, but for its costliness. "You can have a very good joiner," says SOCRATES, "for five or six marks, but you cannot obtain an architect for ten thousand, since there are very few of them." The hurry-scurry of modern life cannot afford to wait for the designs of a few potent, grave and reverend architects like the Athenians, and as long as it is believed that time—that is, expedition in building—is money, people must dispense with Greek lines, unless they are to be set up to rebuke their ways.

(To be continued.)

THE ST. GEORGE'S HALL PANELS.

THE four sculptured panels on the front of St. George's Hall, Liverpool, which are a gift to the city by Alderman Philip Rathbone, were unveiled on Friday last by the Lord Mayor.

Alderman Rathbone said:—My Lord Mayor and fellow-citizens,—I cannot forget that I am standing here where, fifty-six years ago, my father laid the first stone of this great temple of justice and art, of which to-day we are so proud. I cannot thank you too much, fellow-citizens, for enabling me to continue the work that my father began. The thoughts, reasonings and ideas of a nation may be expressed in its literature, the feelings and passions of that nation must be expressed in its art. If there has been one consistent passion belonging to this nation above all other nations, which is and will be recorded in history, it is the passion of justice, insisted on by that Magna Charta which guaranteed that a workman should never be separated from his tools. However unequal Englishmen may be in wealth, rank or power, in the acknowledgment of their personal rights they have always been equal to an extent no other nation can rival; therefore it is that Justice in her childhood is here represented as

a daughter of the poor in the first panel, and in the last she receives the kiss of righteousness and the crown of immortality, signifying that in the highest civilisation she will be as ever-present and as invisible as the air we breathe, and without which we cannot live. I am only too grateful that you should have allowed Mr. Stirling Lee to have expressed so worthily and in so dignified a manner ideas which, without the aid and sympathy of a great town, might have died for ever. I am proud to think that a town, which unhappily derived so much of its wealth from the slave-trade did, when it was convinced of the iniquity of that trade, send up William Roscoe to vote for its abolition; therefore I think we are worthy to have in Liverpool what I believe to be the finest temple of justice in Europe. We have to thank Mr. Stirling Lee for continuing in a thoroughly worthy and dignified way the building which had the good fortune to be commenced by Mr. Elmes, and so enabling us to say that Liverpool has known how to appreciate the gifts of genius which were placed at her service. You have now to fill up by statues the niches over the panels to complete this end of the building, and then you will have at the other end the panels and niches to fill up in order to express the prosperity and the art which are the natural result of giving every man his full rights and genius its full play. My Lord Mayor, I now fulfil the promise I made six years ago and hand over the panels to the town, and, thanks to the earnestness and genius of the sculptor, I do not feel ashamed of the way in which I have fulfilled that promise.

The Lord Mayor, in his speech, said:—In voicing the feelings of my fellow-citizens, I wish to say that we feel deeply grateful to Mr. Rathbone for his generosity in placing these panels here, and we have also to thank Mr. Stirling Lee for the description he has given of the panels.

Mr. Stirling Lee said:—My Lord Mayor, Ladies and Gentlemen,—How can a man whose art is a silence thank you adequately in words for the opportunity you have given him to place his work on this grand building? If I felt that it transmitted to you some of the delight that I have had in its production I should indeed be content. No words can express what my feelings have been in undertaking the responsibility of this work. My one anxiety was that the work should add to the beauty of the architecture and its completion. I heartily wish you would take the old proverb that speech is silvery but silence is golden. I silently give you the thanks that no gold can purchase, the feelings of a sculptor to his most generous patron. I must ask Alderman Philip Rathbone, who has so generously shown his confidence, to take silence to be the outcome of a full and thankful heart. As an artist I have come to know that the same spirit that moved the citizens of old to beautify their towns is not dead, but lives in its fulness in Alderman Philip Rathbone. How I wish it was in my power to tell you how this city of Liverpool is his very life. The bigness of the man has been revealed to me during my connection with him in this work. Nor am I likely to forget the generosity of those two citizens connected with him, the late Sir James Picton and Alderman Edward Samuelson. I should like to mention a bright artistic incident which illustrates the brotherly feeling which binds us, your younger sculptors in England, and the sympathy we have from our brother artists. This is nobly shown by the action taken by Mr. Alfred Gilbert and Mr. Onslow Ford, and by your late art professor, Mr. W. M. Conway. The two former are now at the top of the tree in their art, and the latter may truly be said to be at the summit of the mountain. I would gladly close here, but I have been told that you might like to know my thoughts on St. George's Hall, and my intention in the panels. After twelve years' close study of the building I feel it to be without doubt the greatest architectural work produced for many ages. The idea and design contained in it stamp Elmes as a genius to be placed in the ranks of the greatest men of all time. You have allowed me to fill in the growth and triumph of justice, and in doing so my life has had a desire satisfied such as has fallen to the lot of few sculptors.

Alderman Rathbone proposed a hearty vote of thanks to the Lord Mayor, and in doing so said he had received the following letter from Mr. W. M. Conway:—"My dear Rathbone,—I am just going abroad, so cannot come to Liverpool to attend the interesting ceremonial on Friday. I have watched the completion of the panels in Mr. Stirling Lee's studio with the greatest interest. I feel assured that, when all six are seen together in their places on St. George's Hall, their decorative effect will be evident to everybody. They are, indeed, from all points of view, a most interesting series of sculptures—original in artistic quality, pregnant with meaning, powerful in workmanship, and admirably adapted for the places they occupy. I congratulate the artist, yourself and Liverpool upon the completion of the first half of a most important work, destined to be for, I hope, countless generations a valuable possession to the city, and a monument of enlightened liberality."

The thanks were warmly given, and this terminated the proceedings

THE DECORATION OF ST. PAUL'S.

A MEETING, with the Lord Mayor as chairman, was held at the Mansion House on Friday last to obtain aid for completing the decoration of St. Paul's Cathedral. The authorities had announced that the fund collected in 1870 for the decoration of St. Paul's had now been practically exhausted, and it had become necessary to make a further appeal for the completion of the work. The following work had been done:—The moving, re-erecting and improvement of the organ; filling in six of the spandrels of the dome with mosaics; the reredos, credence table and marble pavement of the apse; the side screens in the sanctuary; six painted windows in the apse and two in the clerestory; the large amount of mosaic-work in the apse and the sanctuary; the sedilia; and the seat for the bishop in the sanctuary (a considerable portion of the cost of which was contributed as a memorial to the late Mr. Edward Thornton). They found themselves, at the close of the experience gained, in possession of a scheme which seemed to solve the difficult question of the decorative treatment of the cathedral, but they could not hope to complete the works for less than 100,000*l.*, and this would not complete the decoration of the aisles.

A letter had been received from Mr. Gladstone, and the Dean mentioned that the last thing which the right hon. gentleman did before the operation was performed on his eye was to write it, while the first thing he did after the operation was to inquire whether it had been forwarded. The letter was as follows:—

"I Carlton Gardens, May 23, 1894.—Dear Mr. Dean,—As one of those who joined in the movement of 1870 under Dean Mansel, I cannot but hope for the full success of your new effort on Friday next, for regarding it, together with its more obvious aims, as an effort to remove a reproach from the City of London. That great commercial community, the first in the world, is proverbially liberal in meeting all claims upon its bounty, and here, I cannot avoid thinking, is a claim not only on its bounty but on its credit. But this claim, notwithstanding the munificence of individuals, has never yet been generally acknowledged. It seems only to require being mentioned in order to be admitted. Nor can there be, I suppose, a time more appropriate for the admission than the present moment, when this noble structure, standing at the head of all the ornaments of the City, has had just enough done towards repairing the deficiencies of its interior to make more glaring than ever the necessity of doing more. There is probably not a single church in the entire country which does so much as the St. Paul's of to-day, in the way of direct ministration, for great masses of the population. Nor can I omit all reference to the striking example which has been set on this occasion by the artist who has undertaken the pictorial work. Mr. William Richmond having by his talents attained a grade in his great profession at which (I am glad to believe) it becomes highly lucrative, has spontaneously cast aside a large portion of his prospects of fortune in order to minister to the completion of this great national, ecclesiastical and religious work. Such conduct requires no eulogy in honour, fame and gratitude from posterity. But this reward the present generation of the great and munificent community of the City would also insure for itself by the simple process of seconding his example.—I remain, dear Mr. Dean, with much respect, faithfully yours, W. E. GLADSTONE. The Very Rev. the Dean of St. Paul's."

The Archbishop of Canterbury proposed the following resolution:—"That this meeting recognises the importance of completing the decoration of St. Paul's which has been so successfully commenced by Mr. Richmond whilst it is able to secure a continuance of his services." He thought they would all agree that the commencement of the work had been successful. Beauty of workmanship, beauty of design and harmoniousness of colouring were what they had been looking for and expending a great deal of money to attain for many years; but he thought few could look upon the cathedral roof now without feeling the particular work which mosaics did in preserving for ever imperishably the chief grandeur of the Christian ideas of the time. He thought that the continuance of Mr. Richmond's services, while they could have them, was exceedingly important when they thought of how many glorious buildings had been ruined by the withdrawal of the architect in the very midst of them. In Mr. Richmond they saw what it was to have been steeped from earliest years in the love of beautiful and expressive and artistic work. He had been told that when Mr. Richmond was a child eight years old he first entered St. Paul's with his mother, and that he remarked to her, "What if I were to become a great artist and were to cover this cathedral with mosaics or frescoes?" When the request was first made to Mr. Richmond to consider the possibility of undertaking the work, he at once agreed to set aside the lucrative income he was receiving for his artistic work and to accept a modest stipend which would enable him to give his time and thought to the great cathedral which had impressed him so deeply in his early years. Mr. Richmond's services were by no means limited

either to the design or the superintendence of this great work. He had always had in his mind since the idea came to him of working at St. Paul's—a most important consideration—the possibility of creating a British school of mosaic-work. He had begun in earnest in this matter, for nobody but a British workman or a British artist had touched a single thing connected with the work at St. Paul's. It was no small thing for England that a great master should stand up and say, "I will devote my time and everything I have to the formation of a new school of art and of a new industry." The expenditure of a large sum of money would be required, but he desired to point out that every farthing raised and spent on this great work would flow through natural channels in the way of wages to support the wives and families of some of the most deserving of the English people.

The Bishop of London said he felt that in appealing to that meeting he was addressing an audience that was ready to accept the appeal beforehand. He only asked them to do what ought to be done for the glory of their own building. It was the most beautiful building in the City, and he did not know any other building in all England with which he would compare it. In many respects it seemed to him that St. Paul's stood very high indeed in the list of the most beautiful buildings in the whole world. He moved the following resolution:—"That to secure the continuance of the work of the decoration of St. Paul's, additional funds are needed, and to obtain these it is necessary to seek further assistance from all who desire to see the completion of the work."

Professor Jebb, M.P., in seconding the motion, observed that under the roof of St. Paul's two different methods of mosaic could now be compared—the smooth, modern method, brilliantly represented by Dr. Salviati's work on the dome, and the earlier and rougher method as seen at Ravenna. The great idea which Mr. Richmond brought to his work in St. Paul's was the bold adoption of the older method, to the characteristics and advantages of which he referred. He afterwards testified to the reverent care which had been taken by Mr. Richmond to harmonise the decorative work at St. Paul's with the older glories of the cathedral.

The resolution was carried unanimously.

THE PHILÆ TEMPLES.

A MEETING of the Egypt Exploration Fund was held on Wednesday in last week. Sir John Fowler, C.E., was chairman. It was stated that the total expenditure of the past year was 2,140*l.*, of which the principal items were M. Naville's expenses, 380*l.*; those of Count d'Hulst, 479*l.*; tackle, &c., 37*l.*; transport of antiquities, 47*l.*; and students, 146*l.* There remained a balance of 2,160*l.* The publications of the Fund had produced 143*l.* The Archæological Survey Fund showed subscriptions 491*l.* and expenditure 1,239*l.* The Exploration Fund had advanced 712*l.* for the survey.

The Chairman said they would naturally expect him to say a few special words respecting the possible damage to the beautiful island of Philæ, and to its most interesting and picturesque ruins, by the erection of a high barrier across the Nile to secure a much larger supply of irrigation water at low Nile, and especially when several years of low Nile followed each other. In the latter events serious losses and widespread distress were at present inevitable. The only means by which provision could effectually be taken against such a disaster, and full effect given to the recent improved irrigation works in the delta of the Nile, was by the construction of a dam. Now that deficits had disappeared and the times were favourable the Egyptian Government had wisely determined to take practical steps, and had appointed a Commission to report on the various schemes suggested. These schemes had all been found unsuitable, with one exception, which was to construct a dam across the river near the Assouan cataract. The river was here of moderate breadth, and its bed was of granite. There were two alternative sites, one to the south and the other to the north of Philæ. If the former was chosen Philæ would not be interfered with, but if the latter was selected Philæ would be overwhelmed in the pent-up waters, unless some method of preservation was adopted. In either case the level of the Nile would be affected for 150 miles above the barrage. The more southern scheme would involve very great cost and risk. It was not surprising that a majority of the Commissioners adopted Philæ as the site, and so far he agreed with them. If the Egyptian Government adopted this scheme most elaborate surveys and investigations would be required before details could be worked out. It was understood that a large staff of surveyors, under a competent chief, had already proceeded to the spot to commence their studies, which would include an exact survey of the villages, the land on the banks of the river, and the ruins of the temples, which would be liable to interference. He had no doubt the Egyptian Government would proceed with the greatest care, and he would look forward to their publishing a record of the survey over a distance of 150 miles from Philæ. If it was determined to erect a dam to the south of Philæ, thus

involving no interference with the island, a great relief would be felt in Egypt and by all friends of Egypt. But if, on the contrary, there should be circumstances of cost and contingencies that inevitably compelled a decision on some point north of Philæ, the serious problem would present itself as to the best means of preserving the island and its temples. He exhibited exact plans, drawn to scale, to show that these temples were very large and important works. The drawings showed to him, as an engineer, that it would be a work of absolute certainty and of no very great difficulty to raise the temples bodily, so that they would occupy in reference to the new level of the water exactly the same place as they did now in reference to the present level of the Nile. Many of those present had gazed with admiration on this beautiful island with its temples, and had remembered its special claims to protection as having been worshipped in as the most sacred place in Egypt, and that it probably received the ashes of Osiris. The glorious ruins of the Nile valley were the records of the resources and the power of the ancients in constructive works. In recent days the resources and power of the moderns made it possible to reconstruct those temples. It could not have been done twenty years ago. His idea was to utilise some of those modern resources for the preservation of Philæ. They might safely take it that there would be no difficulty whatever in raising every temple in the island without disturbing a single stone, and in filling up the island to the new level, so that the relative position of island and water would be maintained after the construction of the dam. The only change would be an increase of beauty by the greater breadth of water round the island, and its being placed at a higher level. He still hoped that the site south of Philæ would be adopted, but if not, the solution he proposed would be a satisfactory one. The cost would only be a small proportion of the total cost of the new irrigation work. From his personal knowledge he could give an emphatic contradiction to the statement that the people of Egypt were indifferent to the fate of the wonderful ruins of the Nile Valley. He believed nothing would be more fatal to the popularity and success of the magnificent proposal to obtain a perennial water-supply than to get it by the burial of the temples in the lake which would be created. If the work of irrigation was carried out successfully the increase of the wealth of Egypt and the increase of the comfort and well-being of the people would be almost fabulous. It was the only thing wanted to make Egypt the most prosperous country on the face of the earth. He thought it would not be out of place for the members of the Fund to express to the Egyptian Government their great satisfaction with the words of the Under-Secretary of the Public Works Department of Egypt, Mr. Garstin, who had stated that any work which caused either partial damage to or the flooding of the Temples of Philæ would be considered by the whole civilised world as an act of barbarism. When that was the feeling of the Egyptian Government they might be content that that Government would be the last persons in the world to carelessly destroy or injure, or allow to be injured, the island of Philæ.

DISCOVERIES IN THE CITY.

IN digging for the foundation of the premises now being erected in Cornhill by the Union Bank of Australia some most interesting discoveries have been made. At a considerable depth below the level of the street there have been found two parallel Roman walls, with cross walls at intervals, forming a series of quaternions about 30 feet square. They stand on the original ballast, are some 5 feet thick and 10 feet or 12 feet high. They are faced with Roman tiles, and most probably are part of the same walls which were discovered some few years ago under the buildings opposite. It seems that about this spot was one of the boundary walls of the ancient Londinium. The workmen have had to cut a portion of the walls away, but found the work exceedingly arduous, it being quite as difficult as cutting through a solid block of granite. The wall is composed mainly of chalk, flints, Kentish rag and cement. Several pieces of pottery, all more or less broken, have also been found, portions for the most part of water-bottles and vases, some of which are prettily marked. No bones or coins have been turned up at present.

At the old premises in Threadneedle Street of Messrs. Prescott, Dimsdale & Co., which are being demolished to make room for new offices for the Sun Assurance Company, there has just been found, apparently under the floor of what was once one of the banking-rooms, a brick chamber or vault about 6 feet square and some 7 feet or 8 feet high, which was quite filled with human bones carefully stacked together. Among these were the two halves of a woman's skull, and, from the clean manner in which the bone is cut through, it is assumed that probably a post-mortem examination was held on the body. How the bones came to be there is at present a mystery, but an explanation may perhaps be found in the fact that many

years ago, before its removal to Moorfields, the church of St. Bartholomew (Exchange) stood on this site. The bones have been removed in cases to Ilford, and there reinterred.

THE HELLENIC SOCIETY.

AT a meeting of the Society for the Promotion of Hellenic Studies, held on Monday, Miss Eugenie Sellers read a paper on a Greek head in the possession of Mr. Humphry Ward. The head, which is that of a woman, is sculptured in Parian marble, and is in a relatively good state of preservation. The nose, however, was rather badly disfigured, though enough of it remained to enable it to be restored to its original form. After a minute consideration of the workmanship and the treatment of the hair and features, Miss Sellers concluded that the head was an original piece of sculpture dating from the first half of the fifth century B.C., or just before the time of Phidias. From several points of resemblance between it and the Aphrodite in the well-known throne of the Villa Ludovisi, she was inclined to think that they were both of the same period and the work of the same artist, namely, Calamis, and she suggested that this head, too, represented Aphrodite. In the discussion which followed, Mr. A. S. Murray, while agreeing on the whole with Miss Sellers, questioned whether the Ludovisi throne was so archaic as she supposed. The second paper was on the paintings of Panæus, a brother or cousin of Phidias, and in the absence of the writer, Mr. E. A. Gardner, it was read by his brother, Professor Gardner. It dealt with the vexed question of the exact position of the paintings which Pausanias describes as having been executed by Panæus on the throne in the temple of Zeus at Olympia.

TESSERÆ.

Perpendicular Ornament.

AMONG the ornaments prevailing in the later period of the Perpendicular style are the Tudor flower and rose. The Tudor flower is a foliated crest set at intervals upon the cornices of screens or upon tie-beams, transoms, capitals, corbels, &c. It is said to resemble a strawberry-leaf. A small and simple trefoil is frequently placed in the spaces between the leaves. A corbel in Magdalen College, Oxford, is enriched with this flower, which is rarely found in work of the fourteenth century. When used as a crest it is variously formed, but always upon a regular system. Sometimes a row of attached squares, placed lozenge-wise, their bases connected by inverted semicircles, forms the groundwork of the design. A leaf, or a conventionalised form of leaf, is arranged in each square, and often three buds, berries or other fruit are set up in a pyramidal form in the spaces between the leaves. The squares are sometimes not attached, but arranged at certain distances apart. There are several kinds of architectural roses—the simple five-petaled rose, a conventional form of the dog-rose; the double five-petaled rose, the triple five-petaled rose, roses with six single petals, and double and triple six petals. The single rose was used in the reign of Henry VI., and the double rose surrounded by rays is said to be the cognisance of Henry VI. and Edward IV. It occurs on pulpits in Worcester Cathedral and Magdalen College, Oxford. The double rose ornaments a pedestal in a niche of Henry VII.'s Chapel, Westminster. It is often used alternating with *fleur de lys*, and it is sometimes enriched by a floral wreath. The triple rose is beautifully sculptured upon the south porch of King's College Chapel, Cambridge; it occurs with the portcullis. Spandrels, particularly during the Perpendicular period, gave the Mediæval architect another field for the exercise of his skill in designing floral decorations. In the early periods they were mostly plain. On the tomb of Archbishop Theobald, in Canterbury Cathedral, the space between the arches has simply a trefoil on an upright stem. In the chapter-house of that cathedral the spandrels have sunk panels filled with diaper-work. In the spandrels of the arches in the triforium and in those of the lower arches in Westminster Abbey there is diapering. Each spandrel of a Perpendicular doorway is mostly composed of a quatrefoiled circle, having a shield, rose or foliage in its centre, and the remainder filled with foiled panels. The spandrels of the porch of King's College Chapel, Cambridge, exhibit the Royal Arms of England in elaborately-foiled circles, and in the panels the Tudor rose. During the same period the spandrels of the nave arches were often highly ornamented, as in the church of St. Mary the Greater, Cambridge. In designing ornaments in spandrels, especially of the Perpendicular period, the usual course was to insert in the triangular space either vertical foiled panels, a circle quatrefoiled, or a square modified for a shield or a portcullis. It was an easy and save-trouble system to fill up a spandrel with a foiled circle, and then to foil and foliate the spaces remaining, but to group foliage, flowers and

fruit was neither an easy nor an economical process. When plants were selected, the geometrical rule for arranging them was the same, although the result was different. The stem, if its root was not hidden by the leaves, germinated from one of the angles, and was coiled in a circular form, sending out shoots to the intermediate angle and to fill vacant spaces, and it then assumed a flowing line to the extreme acute angle. The end of a stem, as if broken off, should not be introduced. The Mediæval architects did sometimes represent foliage with such stems in crockets as well as in spandrels, but these examples should be avoided, as it is much better for the branch to grow out of the building than to appear to be stuck on. Foliage flowing from the mouths of animals, or from an unnatural extension of the tail, should not be imitated. Sometimes the latter assumes beautiful curved forms and foliage; it would, however, be as ornamental and less absurd if the animal were omitted.

The Mosaics of St. Sophia, Constantinople.

The dome, arch or conch was built with brick or stone and rendered with rough plaster to make a key for subsequent coatings. Then a strong and fine plaster nearly an inch thick was put upon it. Cartoons or drawings were made to assist in transferring the subjects to the wall, or they were drawn on the plaster itself; then, beginning with the most important part, the artist knocked out with his chisel a piece of the plaster corresponding in size to that which would be occupied by a few tesserae. He then went to the trays in the compartments of which the coloured glasses were sorted, and selected a piece of the vitreous material of the proper colour, which might be of the size of a circle 5 or 6 inches diameter and half an inch thick. To cut this to a particular shape he used a particular apparatus. Placing the piece of mosaic upon a sharp edge of iron, and striking it with an edge tool exactly plumb with the under iron, he fractured it in a direct line between the two edges. This was the later method, but an earlier one was to draw a hot iron along the line in which it was desired that the material should be fractured. Having thus the small piece he wanted, the artist took some fresh cement (made of 1 part of lime with 2 of marble dust), inserted the piece, and pressed it till it was flush with the adjoining plaster, and he could see whether more cement was wanted and how the mosaic was bedded, and so he proceeded till he had finished a face or some other leading feature, when he left off to commence in another place, allowing an inferior hand to work upon the draperies, &c. In the ancient mosaics the cement was made as above described. In the Middle Ages it was made with lime and travertine stone, and still later, where the work was very fine, and it was wished to retard the setting, lime and linseed oil were used, so that the mastic remained soft all day, and the mosaics might be eased as they were respectively bedded. There is one peculiarity of treatment which was universally observed, namely, if the artist had to execute a profile of any kind, all the longitudinal joints of the flesh would be parallel to the contour, but instead of the joints of the gold ground abutting directly upon the contour, they followed round it parallel to those of the outer flesh-colour series; the great object of this line of gold ground mosaic was to prevent interference by the joint-lines of the general ground with the repose of the heads. An inferior workman, who had his cubes of gold ground mosaic ready cut to a rough square on the surface, then put them in as fast as possible. That completed the work, and it set. Some of the mosaics at St. Sophia have a peculiar character, which M. Salzenberg observed by the aid of the scaffolding for the repairs, namely, when the mosaics can only be seen from beneath at an angle exceeding 45 degrees, the pieces are arranged with their upper edges set forward from the wall face in tiers further and further apart as the angle of vision is increased. By this means the work is saved on much intervening space, and both material and cost economised—in some parts to the extent of two-thirds of the whole. This method had also the advantage of reflecting the light at a better angle to the eye.

Materials in the Paris Fires of 1871.

Walls constructed of freestone were seriously deteriorated, the stone being destroyed by disintegration and the calcination of the limestone, and offering no further resistance. Columns detached from the walls, which had been exposed to the action of the flames present, and in consequence of this change subsequently aggravated by the action of humidity, a most curious appearance, especially at the Hôtel de Ville and at the Tuileries. The frustra of the columns, having lost their arrises, had a spherical flattened form. Rubble walls, covered with a thick layer of plaster, owing to this preservative coating resisted unchanged, and generally were able to be retained in the process of reconstruction. Walling of brick and (calcareous Silician) mill stone generally resisted better, especially in cellars and underground construction; the brick flues of chimneys remained almost intact. Wood in floors and roofs was completely consumed; but in wooden partitions, where a coat of plaster sufficiently thick was continually exposed to the

action of the fire, the wood was completely preserved. Some curious facts were witnessed. An angle post having been attacked on an upper storey, the fire afterwards extended itself in the interior of the post without gaining the external surface, which was covered with plaster, so that the post, remaining for a long time in its place, had the appearance of a pipe, the interior of which had been hollowed out by the fire. Oak lintels covered with plaster, on the other hand, resisted without injury the flames which traversed the bays of which these lintels formed the upper part. Iron did not resist the action of fire. Where it was not consumed like wood it underwent twisting and contortion, deformation and sometimes exfoliation, which rendered it unfit to be used again, and of which numerous and fantastic examples were seen, especially at the Palais de Justice, the Hôtel de Ville and the Théâtre Lyrique.

Handicrafts in India.

The typical Hindoo village consists exclusively of husbandmen, but as husbandry and manufacture cannot exist without each other, the village had to receive a number of artisans as members of its hereditary governing body. But they are all "strangers within the gate," who reside in the village solely for the convenience of the husbandmen on a sort of service contract. It is a perpetual contract, but in the lapse of 3,000 years the artisans have constantly terminated their connection with a village or have had to provide for sons in some other place, and they at once sought their livelihood in the towns which began to spring up everywhere round the centres of government and of the foreign commerce of the country. It is in this way that the great polytechnical cities of India have gradually been formed. Community of interests would naturally draw together the skilled immigrants of these cities in trades unions, the bonds of which, in India, as was also the case in ancient Egypt, are rendered practically indissoluble by the force of caste. We learn from the Bible that already in the earliest time among the Hebrews numerous trades had developed into separate callings, such as the goldsmiths, braziers, locksmiths, carpenters, masons, potters, weavers and fullers; but it is not until after the Captivity that we find trades unions flourishing among the Jews who had settled in Egypt, the land of caste. In the Jews' synagogue at Alexandria, which was so large that the word Amen at the end of each prayer had to be signalled by the reader to the vast congregation, all the different trades unions sat apart from each other, and the workers in gold and silver, the copper-smiths and braziers, the nail and needlemiths, the potters, carpenters, masons and weavers had each their appointed seats. The spirit of trades unionism thus spread from Egypt among the Jews into Palestine, who at last carried it with them into every country in Europe. In India these trade guilds have also existed from the very beginning of Hindoo civilisation. In the nineteenth chapter of the second section of the Ramayana—or Ayodhya-Kanda—"Scenes in the Ayodhya," the inhabitants of that city are represented as going out in procession with Bharata to seek Rama in the order of the trade guilds—jewellers, potters, ivory workers, perfumers, goldsmiths, weavers, carpenters, braziers, painters, musical instrument makers, armourers, curriers, blacksmiths, coppersmiths, makers of figures, cutters of crystals, glass makers, inlayers and others, with the chief of a guild bringing up the rear. It is just such a list as might be prepared from a census return of the inhabitants of Ahmedabad in Western India at the present day.

Colour in Churches.

Colour may be applied to architecture in various ways. First, in mere lines and plain tints to bring out the architectural features of the building, and to give emphasis to its important points such as capitals, arcades, windows, doors and string-courses, or to make sculpture stand out from its background in stronger relief. Again, colour may be applied in ornamental forms and various colours, so as to add enrichment to the edifice. For instance, a string-course or capital may have such ornamental features added in paint as we often find sculptured upon them. Of course, sculptured ornamentation is the better of the two, but sometimes pecuniary resources do not admit of the expense. Again, colour may be used to supply the effect of absent architectural features. For instance, a window which has no label moulding may have the same emphasis given to it by a line of painting round it, and in the same manner the effect of a great many other architectural features may be supplied by painting. Another important branch of the subject is the application of colour in order to heighten the effect of good proportions, or to diminish and relieve bad proportions. For instance, if a building is too low, it may be heightened a good deal in appearance by multiplying vertical lines on the walls and by putting a receding tint on the roof. Or, on the other hand, the apparent height of the roof may be reduced by a dark colour on the ceiling, and the height of the walls may be diminished by horizontal lines. Sometimes a building appears bare and cold for want of colour, especially if its furniture is meagre and colourless; while, on the other hand, a small church may be spoiled by a

too rich and elaborate style of decoration, especially if it is overcrowded with furniture. Again, a different tone of feeling may be imparted to a building by a different style of decoration. For instance, in churches in the Perpendicular style a large portion of the wall space is occupied by the windows. In this case, of course, stained-glass will be the principal feature of the decoration, and the wall will simply be a framework to display these brilliant translucent paintings. Here we need only add a few lines of painting to carry the colour into the architecture, and the effect of the church will be light and brilliant. Take a church in the Decorated style, which has smaller windows and more wall space, and we shall produce a very different tone, according to our mode of treatment. We may simply paint the walls with a series of historical subjects in bold outlines on the buff-coloured plaster, or we may colour the walls red, and put paintings upon it in other tints; or we may make the walls slate colour, and diaper it with dark red fleur-de-lys, and we shall get three very different effects out of the same architectural outline, and all of them very different from the effect of the light and sunny Perpendicular church.

Northumbrian Fortifications.

Whilst Edward I. was building castles in Wales, he was also at the same time directing the erection of castles and pele towers in Northumberland in great numbers, to keep out the aggressive Scots. He seems to have planted churches and pele towers in such strategical positions that it would seem as if some of the larger ones were put out as outworks, to be kept by men who were able to defend them until obliged to fall back on the neighbouring castle. Throughout the whole of the county there are regular strategical lines of defence. The castles were exceedingly numerous. At the same time that this splendid system of fortification was being carried out, the religious work seems to have been going on in the same great scale. The Norman church, beginning with Lindisfarne itself (the abbey church), had generally its apse. Nearly all these churches seem to have been elongated at this time. Even the priests had towers; their vicarage towers, their houses and their churches being alike fortified. There is a remarkable instance of one at Ancroft, on the first line of strategical defence. In these very disturbed times it was necessary to cut the church in half, and to erect it in conjunction with one half a pele tower. In another district, where the Scots were frequently making raids, are also very strong towers, the doors opening externally and on the church side. There is a popular belief in Northumberland that these towers were used for the people to fly to in case of attack; but that instead of the bolts being on the inside, as they would have been in that case, they are on the outside, and therefore the conclusion can be drawn that they were used for keeping the Scotch prisoners in. The Welsh and Northumbrian examples are alike adapted to their respective sites and to the materials of the respective districts. The castles of Northumberland are, however, finer than those of Wales in respect of material and masonry. Carnarvon Castle, for instance, is built of the shaly stone of the district and of small blocks, while in the castles of Northumberland immense blocks of stone were used in their erection. In Elizabeth's reign a survey was made of the existing pele towers, which led to their being put in repair, and to a great many more being built. The present remains of these military buildings are very considerable, but of course they have been much mutilated. Numbers of pele towers have been built up and used as farm-houses, and very few of them are now existing intact.

Early Brickwork in Rome.

Suetonius, in the life of Augustus, tells us that that emperor boasted that he had found Rome of brick and left it of marble. We must not take this expression too literally, but merely as a description of increased magnificence. The words attributed to him by Dion that he had found it of earth and left it of stone are nearer the truth if we suppose the term "stone" to be applied to all materials of a durable nature, as that of "earth" would certainly imply what was soft and easily perishing. The expression of Suetonius has been taken as the literal description of a fact; but of the monuments remaining known to be prior to the time of Augustus not one is of brick, while on the contrary, from his time downwards, brick was evidently used in the greatest abundance. Vitruvius, who certainly did not publish his work before the time of Augustus, is diffuse in his account of unburnt bricks, but says nothing about the formation of burnt bricks, which seems to prove that they were not then in common use at Rome. He proceeds to state that very good and durable buildings may be made of burnt bricks, and cites as examples several buildings in old Greece and in Magna Græcia. Another circumstance which indicates that bricks were little used at that period is found in his account of *pozzolana*, *pulvis puteolana*, which he describes as an excellent material for building, and as found about Baia and Mount Vesuvius, while in fact this substance is very abundant about Rome, and nearly, if not quite,

universal in the ancient brick and rubblework there. If, however, there are no brick monuments remaining which date certainly before the time of Augustus, there are many such which have been supposed to be of republican times. The Circus Maximus is attributed to Romulus, and some brickwork may be observed among the trifling fragments which are shown as its ruins, but as no one can believe that these are of the time of Romulus, we may as well suppose them after, as before, that of Augustus, especially as the work is of the same nature as that of the Palace of the Cæsars just behind it. The earliest aqueducts were of the time of the republic, but these form a curious lesson against the early use of brickwork, although sometimes quoted in its favour. The Temple of Saturn is also said to be ancient, but whether the lofty brick wall just by the arch of Constantine be a part of the temple, and whether, if it be so, the temple was not rebuilt under the emperors, are both disputable points. It exhibits an abuse of the use of arches, which in this example occur in the solid of the wall when there are no openings below, or none which at all correspond with the upper arches. Such an abuse does not seem likely to have been introduced very early, yet we find something of it in the Pantheon, as has been already noticed. Another edifice which pretends to an early date is that usually called the Temple of Rediculus, built to commemorate the retreat of Hannibal. But Hannibal, according to the antiquaries, approached Rome, not in this quarter, but in the neighbourhood of the Porta Salaria, and such a temple would probably have been built near the spot where he advanced nearest to the walls. The present building is in a valley far from the old circuit of the city, and not at all suited to a reconnoitring position, and the character of the work does not announce an early period of the art of building or of brickmaking.

Kant's Aesthetics.

The doctrine of aesthetics which Kant propounded may be simply stated. The beautiful, he believed, had no real existence in nature, nor is it capable of definition by a single formula. It is a harmony arising from an unknown cause which we place in nature. The pleasure of taste consists in the enjoyment of the harmony between the free play of the imagination and the laws of the understanding. The sublime is the struggle of the imagination to grasp the vast in quantity or power, awakening pain from the sense of limitation, but counterbalancing that pain by the higher pleasure of reason, as it tends at the same moment towards the infinite, so that the discord is merged in purer harmony. What this harmony of the faculties is, is not explained; and in spite of many ingenious efforts Kant's critical deduction of the validity of general principles of taste, as opposed to individual caprice, ends in little more than an appeal to the uniformity of our common nature.

Stoneworking in Athens.

It appears that the Athenians worked the marble to an even, but not a very smooth, face with a toothed chisel before they placed the blocks in the work, and that they afterwards went over the whole exposed surface and finished it to the greatest smoothness and nicety, but without polish, taking off in this operation about one-fifth of an inch; and this has been the practice on the horizontal as well as on the upright surfaces, for the columns of the Propylæa are sunk in to about that depth below the general level. The place intended for their reception was sunk before the lower cylinders were placed, and lest any inconvenience should arise from the wet remaining there before the building was completed, a small channel has been cut from the recess to carry off the water. In the steps the adjoining faces are carefully finished at the internal angles, but both are left rough at the external angles, by which means the accidents and wear which take place during the execution of the work would rarely be of any consequence.

Straight Avenues in Public Gardens.

However pretty the winding walks of our English gardens may be, they are not at all suited for a place of public resort, where any impression of magnificence is intended. They never show the people, which is a point of great consequence. The disposition of the objects in straight lines has in itself an imposing, or to use a term more English, an impressive effect, but this has its limits, and not very extended ones. The too great length of the line makes the individual parts appear little, and the mind is not satisfied with the general impression of sublimity, unless it find the character supported by the objects in its immediate neighbourhood. Beyond a certain point almost any additional length is nearly lost, and, in proceeding along it, we feel its want of variety, without any compensation. If a man were placed at the point where two narrow avenues meet, one of them a mile in length, and the other two, he would not readily distinguish the difference. By extending the line too much, also, in places of public resort, it becomes impossible to fill it with people, and this deficiency is more sensible than the length of the avenue.

NOTES AND COMMENTS.

WE may expect that a new opening for young painters will shortly be available in the decoration of Board schools. A few days ago a deputation from Manchester, but representative also of other districts, waited on Mr. ACLAND at the Education Office in order to persuade him to make arrangements which would enable children to visit museums and galleries of art. It was recommended that attendance there should count as attendance at school. It was also suggested that a small collection like those distributed by the committee of the Manchester Art Museum, and costing about 100*l.*, should be provided for groups of schools. Mr. ACLAND probably surprised the deputation by his desire to do more. The Education Department, he said, had tried to improve the condition of schools in various ways, among others by providing playgrounds and large central halls. Much opposition had been excited. He considered that schools should have pictures, and not on a small scale. The upper portions of the walls might be adorned by a fine frieze. There ought also to be illustrations of historical scenes and representations of natural objects of a larger size than had been attempted. Works of those classes could be produced by artists at a moderate cost. This scheme of the Vice-President will gratify artists. But it would be hard if the painters are expected to execute wall-paintings for sums that will hardly pay for the colours. Although the authorities in Paris can command the services of artists on exceedingly economical terms, they have been able to obtain no more than a few friezes for the schools. The officials of the Department would not sacrifice an hour of their numerous holidays for the benefit of the schools, and they have no right to expect a sort of heroic self-sacrifice from painters. If pictures are employed as aids in the instruction of the pupils, the artists should receive the value of what they supply like the producers of other materials. Mr. ACLAND proposed to introduce provisions in the next Code which would tend to the establishment of school museums.

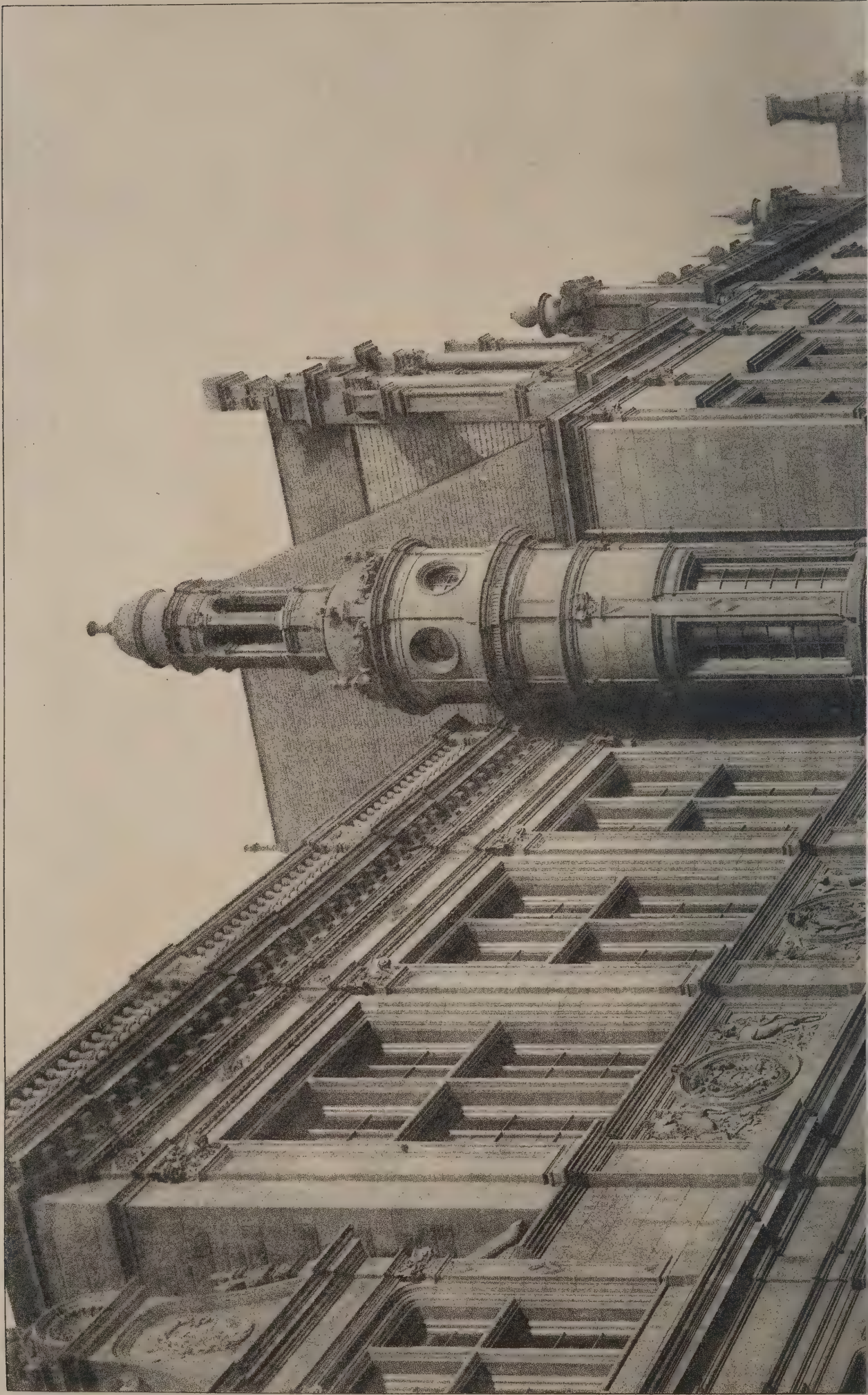
THE relations between the Hanse Towns and England reveal that German competition was turned to account six centuries ago, although often treated as an evil by English traders. The Hanseatic League was an early example of co-operation and assurance. At the present time it is necessary to obtain an armed guard in some parts of the East; in the thirteenth century it was indispensable in Europe. Hamburg, Lübeck and Bremen deserve the credit for perceiving that it is not wise for traders to look on one another as enemies, and it is more economical to pay armed troops that will insure constant protection than to meet the demands of land thieves and water thieves. The merchants knew that force must be met by force, and the provision of the League to meet emergencies is seen in the equipment of a fleet of 248 vessels with 12,000 soldiers in order to vindicate commercial rights in Denmark. The importance of London was shown by the establishment of a factory or emporium in the City. Prior to the existence of the Hanseatic League, German merchants had gained a footing in the City, and possessed their Gildhalla Teutonicorum. To the League probably their privileges were transferred. The Steel Yard, or Steel House, at Dowgate belonged to the League, as well as another in Boston. The kings of England found it was advantageous to make concessions to the foreigners, and to give them monopolies; but the citizens could not understand the arrangement, and at the close of the fifteenth century the London apprentices attacked the stores of the Germans. England was then unable to compete with the League, and the only way to weaken its grasp on the country was by supporting a rival body that was created among the Flemings. As a consequence the League endeavoured to regain power at any cost, and in doing so committed some errors, which were punished by a deprivation of privileges. The contests between the rivals afforded an opportunity for the creation of English merchant adventurers, who by their audacity were able not only to compete with their rivals but to venture on more distant voyages. The German traders undoubtedly exercised an influence on the art of this country by importing foreign examples, and in that way

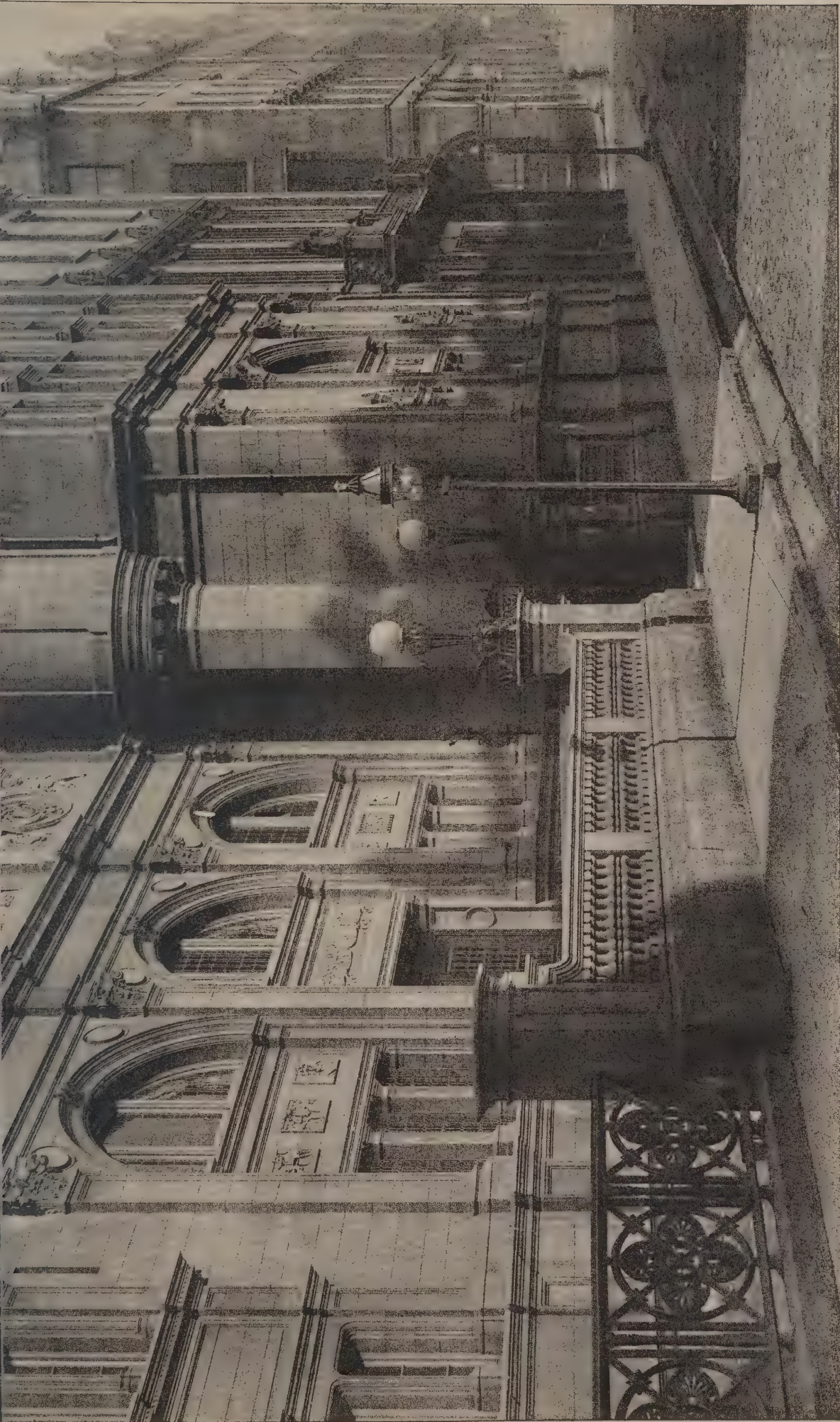
they supplemented the efforts of the ecclesiastics. They taught England, for although it was their interest to confine the industry of this country to wool-growing, the preparation of leather, and the obtaining of lead and tin, they could not suppress the inclination of the people to imitate the goods that were imported. It is also not unlikely that the foreigners were unable to monopolise all the export trade, although it was felony to compete with them. The religious Orders could do many acts that were not tolerated in laymen, and if English products were not unknown abroad, we may assume that the monks were the agents or middle-men.

THE speech which Lord ROSEBURY delivered at the banquet of the Royal Academy is likely to serve the cause which *A Beautiful World* advocates—that is, the checking the abuses of public advertisement. The third number of the journal has enough in its pages to warrant the belief that the Society is gaining a stronger hold on public attention. Many facts are recorded of a nature to inspire a crusade against the license which sacrifices the public interest to individual greed. One case mentioned by Mr. WATERHOUSE is sufficient evidence of the indifference to scenic interest which appears to be a consequence of the Governmental system of instruction in art. It is that of Durham. Mr. WATERHOUSE says:—"The interest and beauties of the place seem concentrated when seen from its two old bridges. Especially is this the case from the lower bridge, whence the view of the river is almost unique in its quiet loveliness. This, one would suppose, hallowed spot has been selected by some one—I will apply no adjectives, however tempted—for the erection of an enormous hoarding of an apparently permanent character, stretching from the houses on the right bank across the gardens which separate the houses from the river, down to, if not beyond, the water's edge, and so shutting out this view—this view unique in its loveliness—from the first part of the bridge, as you approach the town from the railway station. The hoarding, it is needless to say, is covered with the most vulgar and hideous of posters, so disturbing to the mind and eye as to render the subsequent view (but not the best view: that is obliterated) in great measure unenjoyable and unenjoyed. The other bridge is disfigured in the same way, but not to the same extent. The matchless panoramic view of the cathedral, castle and wooded slopes seen through the smoke curling from the crowded dwellings of the town below, and which used to rejoice the heart of the traveller by rail as he approached the city from the north, is now marred by the huge advertisement boards of the local tradesmen, set up clearly with the intention of catching the eye of those on the look-out for the mouldering beauties of old Durham, and giving them in place thereof something up to date to look at, and really worth their attention." Surely, adds Mr. WATERHOUSE, no object lesson could more effectively show the absolute necessity for such a Bill as Mr. BOULNOIS and others are trying to pilot through Parliament, and which would preserve for the public in general the views which are not the property of the tradesmen or of the ecclesiastics of Durham.

FRENCH architects are aware that no advantage can arise to them from exhibiting drawings in the Salon, and consequently modern work is always inadequately represented. This year, as on former occasions, the Médaille d'Honneur has been awarded for one of those studies of ancient buildings in which the French excel. It is, however, a study that has excited extraordinary attention. M. GEORGES PAUL CHÉDANNE had made a name by his discoveries in the Roman Pantheon while he held the Prix de Rome. Having sent a memoir with drawings of the building to the Salon, it was inevitable that he should obtain the highest reward that his brother architects could bestow. Accordingly at the first balloting M. CHÉDANNE secured forty votes, while his four competitors obtained only eleven between them. In the sections of painting and sculpture, it was found impossible for any artist to attract a sufficient number of votes. M. LUMINAIS was the nearest to success among the painters and M. CARLES among the sculptors. The medals are, therefore, withheld in both sections.

The Architect, June 1st 1894.

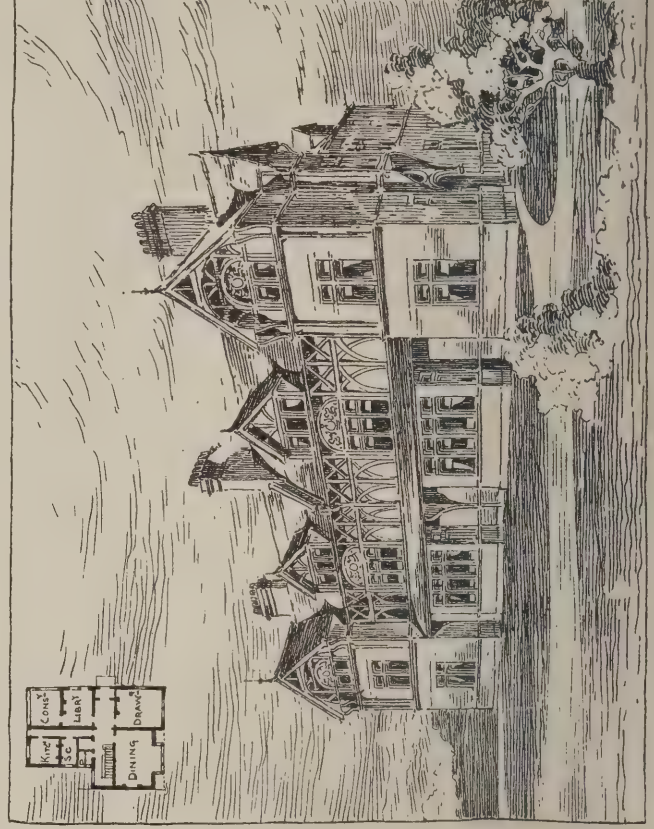
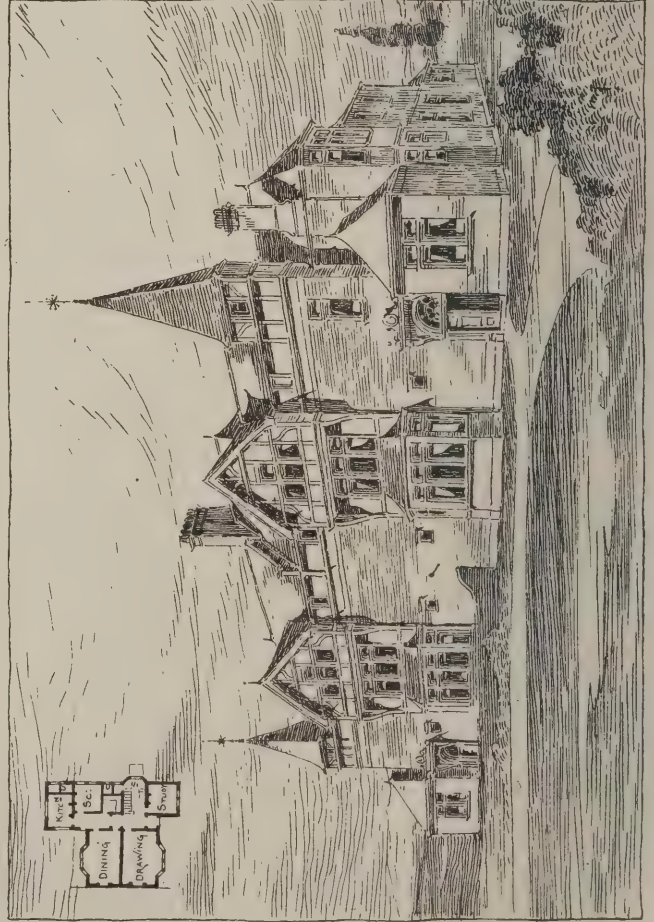
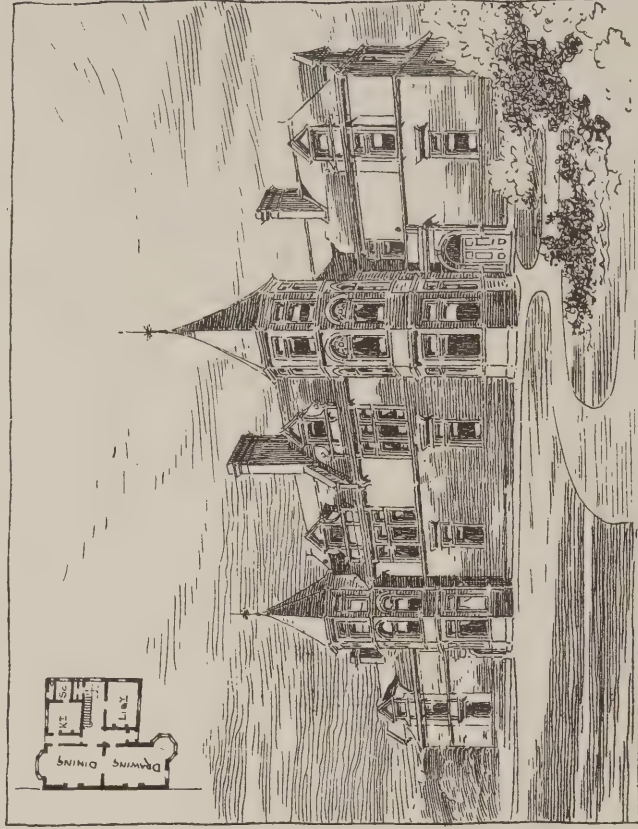


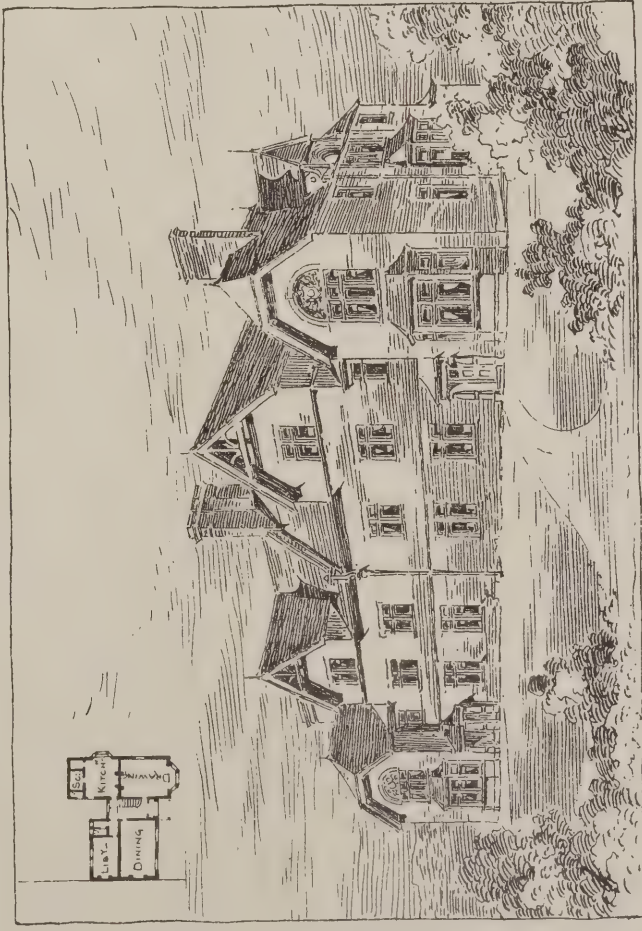
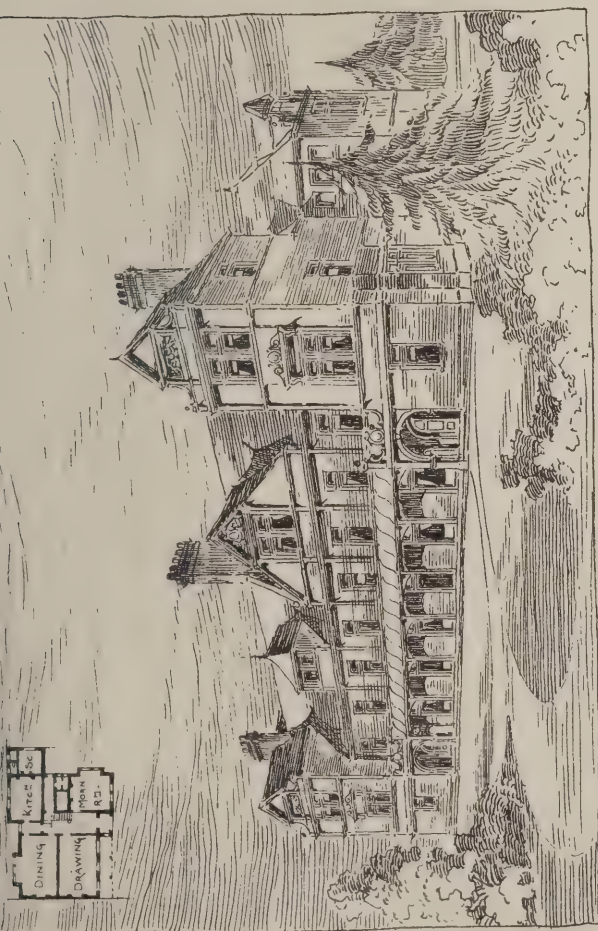


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G. WASHINGTON BROWNE, Architect.





VILLA RESIDENCES TO BE ERECTED NEAR SWANSEA.
Messrs. J. BUCKLEY WILSON, F.R.I.B.A., and GLENDINNING MOXHAM, M.S.A., Architects



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

"TOWERDENE," BRISTOL
Messrs. THORLEY, SON



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DRAWING ROOM.

CK, Architects.

ILLUSTRATIONS.

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VILLA RESIDENCES TO BE ERECTED NEAR SWANSEA.

THESE sketches are of villa residences to be built shortly near Swansea. One pair has already been erected. The material employed is to be red brick, with Bath stone quoins, the roofs covered with red Ruabon tiles, and the external woodwork painted a dark chocolate. The whole of the work will be carried out from the designs of Messrs. WILSON & MOXHAM, architects, Swansea.

TOWERDENE, BRISTOL.—DRAWING-ROOM.

THE ARCHITECTURAL ASSOCIATION.

THE closing meeting of the session for 1893-94 was held on Friday evening, Mr. E. W. Mountford, president, in the chair, the proceedings being opened at eight o'clock.

Messrs. R. C. Neat, P. A. Lamb, L. Sage and P. R. Nathan were elected members.

The A.A. Travelling Studentship, it was announced, was awarded to Mr. C. C. Brewer.

The House List for the following session, as elected, was read out:—

President.—E. W. Mountford.

Vice-Presidents.—A. B. Pite and F. G. Hooper.

Hon. Treasurer.—H. W. Pratt.

Hon. Librarian.—J. W. Stonhold.

Hon. Secretaries.—F. T. W. Goldsmith and Banister F. Fletcher.

Committee.—W. D. Caröe, J. Begg, E. S. Gale, F. R. Farrow, P. Waterhouse, E. Woodthorpe, G. H. Fellowes Prynne, Theo Moore, W. H. Seth-Smith and Owen Fleming.

Hon. Solicitor.—W. H. Jamieson.

Hon. Assistant Librarians.—C. H. Freeman and E. W. M. Wonnacott.

Hon. Auditors.—G. A. Lansdown and E. H. Sim.

Assistant Secretary and Registrar.—D. G. Driver.

Mr. BOLTON read the following paper on

The Practical Side of Travelling.

Mr. Bolton said:—In deciding on any proposed tour a certain amount of previous study is generally advisable, and is to be obtained either from those who have been there or from books. As to books, it is very annoying on your return to find that you have failed to see some well-known example in some place you have visited, and of which you have seen drawings in some book. Many illustrations of old work are sensational in character, and sometimes positively misleading, but have a value if you have seen the thing itself. The best plan of study to adopt is to arrange your notes under the names of towns, placed in alphabetical order, putting down the work of all styles, the name of the artist, and the description of drawings. These notes are best on foolscap sheets of paper which can be pinned together and taken with you. You will soon be able to judge what is worth an effort to see and what is not, according to the credit you assign to the artist after seeing a few examples.

The one indispensable book is a guide-book of the latest edition and the best repute, however dear, as information is money in travelling, and a mistake in making an excursion, or choosing an hotel, would easily cost double the price of any guide-book, to say nothing of the saving of tips to local touts, rendered unnecessary by good maps. For Italy Baedeker is best, for Spain Murray, and for France Hachette, and I specially recommend the Departmental Guides of the latter, which are very useful for indexes of all that there is of interest in each town or village of the Department. Calling on people is not always successful in the way of obtaining positive information on points of detail. "Oh, you know, you just take a bag, and go right south, and come back by degrees," being the usual style of friendly advice. As to going direct south when on a long tour, there is much to be said either way. One reason against is that it is not always convenient to start so early in the year, and another is that you are translated into a new style of work which has no direct bearing on your own; whereas if you go by degrees through France you pass through districts full of work which resembles but is better than what you are doing at home, and naturally you can get to work on it at once. Moreover, when you do arrive south, you have acquired some skill in drawing, and have learnt something of the later results and meaning of the earlier work which is met with further south. It is, of course, a question of season and climate which you must look into. Egypt is visited in the winter, Greece in the early spring, Rome is left after Easter, Florence at the end of July, and so on. Spain can be visited either in autumn or spring, and a winter in Seville may be most

agreeable. As to the countries to visit, Belgium and Germany are good for brickwork and small buildings allied to our own; France should make you logical, Spain critical, and Italy enthusiastic.

Programme is the great feature of French work, the logical following out of certain ideas, excluding others considered as non-essentials. Spanish work invites criticism by the dash with which the work appears to have been done, for form, outline and programme are less considered, and things are often either masterpieces or absurdities. In Italy you will be roused to enthusiasm, because there you will see good work of all styles and the early origins of most subsequent developments, as well as the acknowledged masterpieces of all the three arts. The subject of to-night can only be useful if treated with a detail which has a large element of the ridiculous, but I am not afraid that you will fail to perceive that side of the question. However, to begin with the question of luggage. I never knew any one who took too little, but some who would have been glad to send half theirs home again. The easy manner in which the would-be traveller dismisses the subject previous to departure is in amusing contrast to his sentiments a few hours past the Channel. I had once to use all my influence to prevent a friend coming out to me in Italy, plus a portmanteau, but he candidly owned, on arrival, that no sooner had he arrived at Calais than he was thankful to have only a Gladstone. One reason for this luggage question, which it would take too long to examine in detail, is that the heavy luggage is registered, and hence there are nothing like the numbers of porters at the stations that we have. In making a change, or getting into a train, you will probably have to rely upon yourself, and it is of the first importance to be able to carry your goods yourself, at need. This condition is the determining one in all points of luggage. Registration is fallacious, because, first, it involves arriving early at the station, the process ceasing ten minutes before the train goes; consequently there is generally a great crowd at the luggage barrier, and it is most annoying to have to be waiting about for your turn, when you want to be securing your place in the train. Secondly, it involves waiting at the other end, as the process of delivering the luggage does not commence till the train is gone and is often very slow, as in Paris, where, I am told, three-quarters of an hour is a common time to wait. Hence, if you had nothing registered you would have been off, and arrived in your hotel in the same space of time. Finally, you can only register as far as the ticket goes; luggage above a certain weight has to be paid for, and in some countries no allowance is made at all. Assuming, then, that nothing larger than a Gladstone is admissible, the next question is number of inches. Here the Indian mail gives a clue. The mail through Italy has a limit of 20 inches by 10 inches by 12 inches, and I have had a 24-inch taken to the van. The same 24 inch, I may add, I was only too glad to get rid of later on for a 20-inch, which I consider the largest size necessary even for a year.

So much for No. 1; next, as we are architects, comes the question what size board shall we take. Finally, I decided on a half-imperial, which is really an excellent size. I then had a case made of waterproof canvas bound with leather, opening the long side, with two straps and two buttons for the flap. This case is best with a flat, light iron bar along the top to attach the handle to, as otherwise you will find that the flap will pull out of shape. Have this case wide enough to take the half-imperial board (in a 2s. 6d. portfolio with T-square, two set squares and 12-inch scale), a stool that will fold up flat, a roll of lining-paper and an easel. 1. The board.—This you will find best without ledges, but framed with steel in the thickness, as made by Stanley for abroad. 2. The portfolio.—This is useful to carry about in the street, as it excites less attention, and also to hold the drawings as you complete them and the paper you still have to use. 3. The T-square.—For abroad the extra cost of mahogany is well worth while. The great problem is the length, and after trying both ways, I advise you to shorten it, so that its total length is that of the board. It is of course sometimes a nuisance that it will not reach the edge of the paper, but it is still worse to carry it about projecting in a dangerous manner outside the portfolio. It is also a troublesome thing because of the thickness of the short arm, and I think the best thing to do is to buy one large or two smaller sketching-blocks, which will make up the level over the rest of the board's surface. 4. The drawing-paper.—Take, say, six sheets imperial (cut in half) of hot-pressed and the same of 90-lbs. cartridge, with some cut-up tracing-paper and a roll of lining-paper; this latter should be the best, for the common tears easily and the other is only 10d. a roll. 5. The easel.—This is a matter of opinion, but personally I find it very useful. The 3s. 6d. sold at the stores, which folds in a very ingenious way, is a good one to take, and you might have it reconstructed to fold into three, as then you could stand to it at need.

That completes our second package, and is of course only necessary if you are going away for three or four months. If for less time, the third that I am about to describe will be

sufficient. This is a bag or case of canvas, in two thicknesses, and waterproof, made by Pontifex & Wood (next to Victoria Station), for 18s. 6d. It has two divisions, one of which will take a quarter-imperial board and a portfolio, as before described, while the other will contain your things for a stay of one or two nights. It has, as before, two straps, with a handle and buttoned flap, and also loops, in case you prefer to carry it as a knapsack. It should contain (1) a water-colour case holding a short box of twelve paints, a small water-bottle and a pocket for tubes of colour; (2) a 33-inch tape and a small ball of twine, with a lead plummet, for measuring greater heights; (3) a short spirit-level, most useful in getting certain heights, as of bases, &c.; (4) a pair of callipers of wood opening to 2 feet, useful to take the diameter of shafts and other things otherwise very troublesome to measure; (5) a pocket-case of instruments; (6) a box of twelve pencils, B. S. Cohen F being the best for all-round purposes. So much for the architecture. Then a hand-size hair-brush, short comb, razors, strop, soap in case, short clothes-brush, small box of matches and flannel night-gown. You will also find that you can get two white shirts, collars, and a pair of socks in the other division on occasion. The reason why you will want a quarter-imperial board as well as a half is that the half is mostly for use at the hotel for drawing out what you have measured, and, secondly, that there are many short excursions of one to two nights to be made from a centre-point where you would leave your other two packages. Consequently I consider this No. 3 as indispensable in any trip, short or long.

Now for the fourth package. This is a rug, coat, umbrella and two measuring rods in a case, made up into a roll with rug straps. In luggage the thing to aim at is to have only the absolutely necessary, and what occupies space are generally things which, if we exercised a stricter supervision, we should leave behind. After a time you will know exactly what you want, and you will be able to get ready for a journey at a few hours' notice, and yet go away without leaving the indispensable behind. After luggage, the question of money is of the first importance. It may govern your route to such an extent that will surprise you, and your stay at any place may be either cut short or made unduly long by the difficulties of obtaining supplies. Having tried several plans, I consider, on the whole, that Cook's 5% or 10% forms are better than letters of credit on a private bank, simply because their list of agents is more complete, and contains the places you most want to visit, whereas the agents of the private banks are mostly at modern centres of commerce, which are not what you travel to see. At your bank you will be told, probably with a patronising smile at your ignorance, that their credit notes can be changed anywhere, a pious delusion which one wishes they might have to experience for themselves. Not only will you experience a most distrustful reception in tendering such paper at other than the accredited agent's, but the branch office even of a credit society, many of whose other offices are given in your letter of indication, will decline to pay unless the name of the town where their particular office is situated is given in the list. This sounds incredible, but has happened to me more than once. Consequently, study your letter of indication, and note the towns having agents which you will pass, and arrange to take in your supplies at intervals. Moreover, in France, out of the larger towns, and sometimes even there, the banks are very shy, and raise great difficulties if your papers are not exactly correct. Consequently, it is a very good plan to go to the bank soon after arriving, so as to secure that you will be able to command your money, and if there should be any difficulty you will have time to write to a head-office or to London in order to overcome it. Remember that you will be absolutely helpless if you have no money abroad; the smiling countenance of your *maitre d'hôtel* will become black as night, and everywhere you will find yourself suspected. Happy, indeed, you will be if you find some countryman who will risk a loan to carry you to some other town. And so, if you meet any other Englishman in such a plight, endeavour to assist him, as you hope to be assisted some other day. If you decide on private-bank letters of credit, observe whether they are payable at sight or not, because I have had some at seven days' notice, which made a local office propose that I should wait twelve days before I received the money, being the time to write to Paris, seven days' delay, and time to write back. A very cheerful prospect if you should be in an uninteresting place. You will probably stay longest in small places, where English notes are almost unknown, and the plan of carrying five-pound notes, which may answer in Italy in such towns as Pisa, Genoa, &c., will be disastrous elsewhere. A good hint I can give you is to carry a few sovereigns in a watch-purse as a reserve, as, at a sacrifice, you will, I think, be able to change them anywhere. Having your letters of credit all right, and having found the agency, you are in presence of a difficulty, and that is to obtain the full value of your money. Your paper states that you are to be paid in the local currency to the full value without deduction. Moreover, as you have paid in gold, and the notes are payable in gold at London,

there is a profit to be made on the exchange, and you are entitled to the market quotation of the day. Consequently, in France you ought to receive 25 francs to the pound, plus a premium of 3d. or 4d., according to the market, but which generally amounts to 2s. 6d. on 10l. Now, as the agents can always wait a rise, there need be no scruple on your part in exacting the full value of the day on the plea that they are entitled to something, as you may be certain they will not lose; in fact, I doubt if you will ever get your due. I can, I regret to say, only recall one agency where I have received the full, without asking even in the most reputable houses, though I can remember many battles on the subject. In fact, I confess I have got tired of fighting, and have now and again submitted to the loss, and even to an absurd deduction for receipt stamps. As many of you are men of war, you will do a good service to the weaker brethren by insisting on your rights, and may also flatter yourselves that you are asserting the superiority of English currency. Of course, in Italy, Spain and countries with bad finances you will get very much more than 25 francs to the pound. As I said before, it depends on the market.

Before you start, change at Charing Cross, say, 1l., so as to be able during the journey to pay for goods, porters, &c., in local value, as they will only accept English silver at a loss; and do not, by the way, take English 2½d. stamps with you to send home your letters with, as sometimes happens. In Italy and Spain at present there is practically no gold in circulation, but as the paper notes have a forced currency that will not matter. You must take your chance as to these notes, for you can hardly hope to know good from bad without much practice. With regard to the amount you must take, the expense of travelling is no doubt always increasing, and in estimating regard must be paid to the length of your tour and the plan you have in view. Sight-seeing travel is the expensive method, and the further east you go the more it is so. France is dearer than Italy, which is the cheapest country I have been in. A short tour is also much more expensive relatively, because the initial price of the ticket out raises the average daily price. You ought, especially on a first tour, to keep exact accounts and to average your expenditure from time to time, because you thus learn what constitutes the chief expense in travelling and how you can best reduce the average. It is difficult to compare the relative expenditure of students, because everything depends on the style. You can spend any sum, as some Americans who get through extraordinary amounts for what they do and see. Long stays have an important influence on the average, because such items as hotel tips, porters, buses, sacristans, &c., which bring up the average enormously, when moving about rapidly, become relatively unimportant, and of course you can make better terms at the hotel. Well, subject to these considerations, here are some figures of probable cost:—Nine months, extending as far as Athens, 150l.; six months, France and Italy, 100l.-110l.; three months, 60l.-70l.; two months, 50l.; a month, 25l.-30l.; three weeks, 20l.-25l., &c. These figures involve comfortable travelling, second-class on through journeys, good and fair hotels, photos and occasional excursions, a drive now and again, newspapers, cafés, &c., but mean that you must know something of the language, and in the longer tours you must make some stays of three weeks to a month in smaller places, where you can live for 5s. a day. Of course, you will be told of record cheap tours; but remember this, you go to work, and work on bad food in badly-drained hotels may mean fever, which is decidedly not economical. I have read accounts of tours where, from the remarks made as to weather, people, &c., I have been certain that the writer was suffering from over-cheap travelling. Again, it is a mistake to sacrifice your pleasure to unreasonable economy—I mean by omitting an occasional excursion or other semi-amusement on the score of expenditure, because you will find in your subsequent recollection such outings form the most pleasant features of the trip. But if you do make such excursions, see that you have the means to do the thing properly. One sometimes sees people abroad do such things in a shabby way that they should be ashamed of.

Start your tour with extreme care in your accounts and expenses, as, until you have gained experience, you will waste a great deal of money, and will thus load your average unduly, and it will take much economy to counterbalance it. A good plan is to make up your accounts on leaving a place, including the ticket to the next place and the hotel bill, tips, &c., just paid. Reckon up your balance in the train, and note the amount and hour; then, by deducting from the similar statement on the last departure, you can reckon the number of days and the amount spent, which will give you your average. Mr. Anstey, in *Punch*, under the title of "Travelling Companions," has given a good guide to this subject to those who can see the moral. I have only to add that, in my opinion, Scott's advice, never to go with laymen if you want to work, is sound, for, as he says, when they have finished a place you want to begin. I think, too, that some similarity of age is advisable as well as previous acquaintance, because we all go through certain stages of beliefs, and you will, in the abundance of your time for

talking, infallibly discuss, not so much what you are seeing as general theories of art, and to have to refute your cast-off enthusiasms in the person of a younger companion may be salutary, but is somewhat wearing. Bear in mind what the Master of Ballantrae said to Captain Bourke when setting out on their memorable journey, "Either let us agree to bear all things at each other's hands, or else let us part at once." As to travelling alone, no doubt it procures unanimity, but I question if it is not better to bear all things rather than to be out of accord with nature, which disbelieves that it is good for man to be alone. The great advantage is, from an art point of view, that concentration of mind is essential to the receipt of impressions when sight-seeing, and in working you have the advantage of being free to undertake things that require time, knowing that you can go or stay as you please. France, from the generally genial character of the people, and Italy, on account of the greater number of tourists to be met with, are the best countries to travel alone in, but do not do so in Spain, on account of the long, uninteresting journeys that have to be made from town to town, and the not very sociable character of the people, for a really good knowledge of Spanish is required by those who would mix with them. Travelling with another is a drawback to learning the language without question, and to some extent it prevents your seeing so much of the country and people, but, on the other hand, if you have a friend to go with, excursions on foot or otherwise, which you would not make by yourself, are more feasible, and this especially is the case in those which are made for the sake of the scenery, when absence of work to do might make the solitude too much felt.

It is hazardous to rely on finding some one abroad, as you will generally find the parties already made up, and fellow-students are not often met with in certain of the larger centres. It is an interesting chance if you should be able to travel with a foreigner, especially of your own age, and leads to a rapid progress in French, which is probably what he will speak.

Concierges and sacristans should not be ignored, and according to the country should be their treatment. In France they are very powerful and often troublesome; in Italy and Spain, remember that attempts to postpone your visit to their customary "to-morrow" may be met by saying that you are leaving to-morrow or to-day, as the case may be, when the loss of the prospective tip may be found to be effectual in removing difficulties. It is a good plan not to alarm a sacristan or concierge by going with a big board and apparatus, as if you were going to be a long time at work, but rather to begin quietly at first until they have got used to you. The thing is simple enough—no one average man wants to do more work than he need or to be put to much trouble, and the aim of the average sacristan is to put through as many visitors and to receive as many tips as possible during his working hours, and hence popular show-places are the worst to work in, the artist, and especially the architect, being a troublesome intruder. You will do well to ascertain the hours of the attendants and to conform to them as much as possible, and when going round in a party in the regular official circuit of a show-building, you should, I think, in politeness keep with the party, and on its completion ask for permission to make further study. In this way you may obtain as a favour what would only be obtained by force with much loss of time and temper.

Introductions to architects and others abroad are very pretty things, and sometimes interesting information is obtained from the people called upon, but, firstly, you may have no end of trouble in finding the addresses in a strange place; secondly, in calling the best hours of the day will have to be employed, and, thirdly, the interviews themselves may take up a disproportionate amount of time. They should not be used by those who are not at home in the language of the country, and it is no easy matter to converse on all the subjects that will be raised.

The Royal Institute of British Architects' travelling card, the Academy bone, and, lastly, the Architectural Association membership ticket, will be found of service as credentials when applying for leave to draw and as proof of your profession. The Royal Institute of British Architects' card, however, is not well got up; it compares most unfavourably for impressiveness with the 3s. 6d. Government passport which anyone can get. Moreover, the face should be in the language of the country, and not the back, as suspicion is caused by the request to read the back, and the presence of other languages there also is not favourably regarded. An adapted copy of the Government passport, and one for each country, would be the best thing to give students. The letter given to prize students is, however, favourably received, though it is only in English; it is big, and looks official. With it you are taken for a student sent by the Government, for the English private enterprise is not understood in countries where the State does most things.

At the conclusion of the paper a hearty vote of thanks was accorded to Mr. Bolton, as proposed by Mr. R. Phené Spiers and seconded by Mr. Banister F. Fletcher.

(To be concluded.)

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

RICKMAN'S LETTERS ON THE ARCHITECTURE OF FRANCE AND ENGLAND.

(Continued from page 342.)

LETTER V.

I NOW resume my consideration of the architecture of England and part of France, and I intend in the present paper to notice such buildings in both countries as are either known to be of a date prior to the year 1000, or in their clear difference from anything of later date, may, from that clear difference, and their relation to works known to be before the year 1000, be well permitted to be considered of an earlier date, until proved to be of a later one.

In France there are the following buildings:—The walls of the city of Bayeux; the theatre at Lillebonne; the church of St. Germain, at Rouen; the ancient portion of a church at Beauvais, now called the Basse Euvre. All these present clear and definable Roman features.

At the theatre at Lillebonne we have regular ashlar masonry with rubble backing; the front work very well done, with good clean joints. Also a wall with small stones about 6 inches long and about 4 inches high in the courses; these form a thin skin, and have rubble backing, but with horizontal courses of what are called Roman bricks, *i.e.* flat tiles about 14 inches long, 11 inches broad, and not quite 2 inches thick. These tiles act as binding courses to the small stone and rubble of which much Roman walling is constructed.

This horizontal bond of tiles accompanies nearly all the Roman walling which is built of small stones, both in England and that part of France included in my present observations.

It is present in the walls of Bayeux, where the courses of stone are irregular—some small, some large; in the church of St. Germain, where the walling is of squared stone, rather larger than the small stones at Lillebonne; and here there is also an outer tier of bricks around the arches, like a drip-stone. It is also in the Basse Euvre, at Beauvais; here the walling is small stones with large joints, and the exterior arches, as well as the drip course round them, are partly formed of Roman bricks. The interior walling of this building is the white stone of that country, which, though so soft as to be easily worked, retains its edge and its form completely to the present time. This building (now a firewood warehouse), though sadly neglected, has much of its interior work, plain round arches and square piers, in very good condition.

These buildings are in France so well known to antiquaries, and their dates so constantly acknowledged as prior to the year 1000, that I trust I may be excused the task of attempting to prove that they are of that date, and thus save the valuable time of the Society.

In England we have, first, a variety of Roman walling acknowledged to be such.

These walls are in various counties, from Northumberland to Kent, and many of them (and I believe all in which the construction was necessary) have the bonding bricks more or less frequent.

There are a few Roman examples in which, from the mode of construction with large blocks of stone, it does not appear that the bonding bricks were used. Of these examples I may mention two which remain in a more perfect state than, considering their age, could well have been expected.

The first is the North Gate at Lincoln, which, as when first erected, is still used as the passage through the walls. This gate had originally an impost and architrave moulding; but they are now hardly visible.

The second is a portion of the Roman Wall near the military road from Newcastle to Carlisle; its walling is well done and in a very perfect state, and near it is a quarry of most excellent building stone, from whence that used in the wall appears to have been taken.

I do not intend to notice all the Roman works known to exist in England, but merely a few for the purpose of showing the similarity of construction with those noticed in France; and of referring to them as linking with those churches which I suppose to have been erected in England before the year 1000.

What is called the Jews' Wall, at Leicester, is built with many of the flat tiles, or Roman bricks; and the portions of Roman wall still remaining near St. Albans, in Hertfordshire, and at Richborough Castle, in Kent, have these Roman bricks used as horizontal bond, in the same way as we have noticed in the French edifices.

I shall now, previous to enumerating the buildings which I have reason to believe were erected before the year 1000, state those particularities of their masonry, their forms and their details, which, by the difference from works of known Norman date, give reason to suppose them of this very early period.

First, as to the masonry, there is a peculiar sort of quoining, which is used without plaster as well as with, consisting of a long stone set at the corner and a short one laying on it, and bonding one way or both into the wall; when plaster is used these quoins are raised to allow for the thickness of the plaster. Another peculiarity is the use occasionally of very large and heavy blocks of stone in particular parts of the work, while the rest is mostly of small stones; the use of what is called Roman bricks, and occasionally of an arch with straight sides to the upper part instead of curves. The want of buttresses may be here noticed as being general in these edifices, an occasional use of portions with mouldings much like Roman, and the use in windows of a sort of rude baluster. The occasional use of a rude round staircase, west of the tower, for the purpose of access to the upper floors; and at times the use of rude carvings, much more rude than the generality of Norman work, and carvings which are clear imitations of Roman work.

All these marks do not in every case appear in each of the edifices; but they are all more or less united to one another, and thus form a very interesting series. The buildings of this character as yet found are:—

1. The church at Whittingham, in Northumberland.
2. The west end of the church of Kirkdale, Yorkshire.
3. The church of Laughton en le Morthen, Yorkshire.
4. The tower of St. Peter at Barton-on-the-Humber, Lincolnshire.
5. Part of the west end of Ropsley Church, Lincolnshire.
6. The east end of the church of Repton, Derbyshire.
7. The tower of the church of Barnack, Northamptonshire.
8. The east end of Whittering Church, Northamptonshire.
9. The church of Brigstock, Northamptonshire.
10. The church of Brixworth, Northamptonshire.
11. The tower of the church of Earl's Barton, Northamptonshire.
12. The tower of Clapham Church, Bedfordshire.
13. The tower of the church of St. Benet, Cambridge.
14. The tower of the church of St. Michael, Oxford.
15. A part of the tower of Trinity Church, Colchester.
16. Some small portions of the church of Stoke d'Abernion, Surrey.
17. The east end of the church of North Burcombe, Wiltshire.
18. The doors (now stopped) of Britford Church, Wiltshire.
19. A small part of the church of Worth, Sussex.
20. The tower of the church of Sompting, Sussex.

This list comprises twenty edifices in thirteen counties, and extending from Whittingham, in Northumberland, north, to Sompting on the coast of Sussex, south; and from Barton-on-the-Humber, on the coast of Lincolnshire, east, to North Burcombe on the west. This number of churches extending over so large a space of country, and bearing a clear relation of style to each other, forms a class much too important and extensive to be referred to any anomaly or accidental deviation, for the four extreme points all agree in the peculiar feature of long and short stones at the corners, and those stones of a varied character, and all easily accessible in their respective situations.

These English examples of towers and churches I may, I trust, be permitted to describe with some minuteness, so that persons who visit them may know wherein consists their likeness to each other, and difference from other styles.

From what I have seen I am inclined to believe that there are many more churches which contain remains of this character, but they are very difficult to be certain about, and also likely to be confounded with common quoins and common dressings, in counties where stone is not abundant, but where flint, rag and rough rubble plastered over form the great extent of walling.

In various churches it has happened that a very plain arch between nave and chancel has been left as the only Norman feature, while both nave and chancel have been rebuilt at different times, but each leaving the chancel arch standing. I am disposed to think that some of these plain chancel arches will, on minute examination, turn out to be of this Saxon style. I am the more induced to think so from the tower at Whittingham, in Northumberland, having close to it one such plain arch, and next to it another semicircular arch, which would be called, if not early, certainly not very late Norman, yet strikingly different.

As the portion of France I visited, though containing a great variety of large edifices, was not visited as to the small churches to an equal extent, owing to the difficulty of getting to places not on the high roads, I cannot say whether there is anything like our combination of long and short stones; only one church I saw at a village near Beauvais had any such antiquity, by tradition, as before the year 1000, and there the

only feature noticeable was a resemblance to the walling of the Basse Œuvre at Beauvais, both being formed of small stones with large joints.

I shall now proceed to state more clearly the distinctions of this early or Saxon style, and then to describe those edifices above enumerated.

Arches.—Where of considerable size they are semicircular, but there are smaller apertures of doors and windows with straight slopes to the aperture. In some doors, and in some larger arches, there is a regular impost at the spring, which has a rude resemblance to Roman mouldings.

In the small windows a sort of rude baluster, such as might be supposed to be copied by a very rough workman by remembrance of a Roman baluster.

Masonry.—First, a sort of quoins or framing of stone projecting from the face of the wall, the filling-in often of small rough stonework, and sometimes plastered. Second, the use of very large pieces of stone, much larger than usual in Norman, for parts, while the remainder is of small and very roughly-hewn stone.

Staircases.—In two instances (more perhaps may hereafter be found) there are on the west side of the towers circular staircases, equally rude as the masonry of the church; but in one of these instances this staircase has been found to be an addition.

Bricks.—It is not easy to discover whether the Roman bricks (or, rather, flat tiles, as we should now term them) that we find in one at least of these edifices have been laid before and are the ruins of a former building, or were made for the purpose and used new.

Ornaments.—In one, if not more, of these buildings there are some very rude carvings, more rude than most Norman work.

Plan.—All the corners square, and there seems no instance of a buttress to these buildings which is not evidently an addition.

As I cannot presume to settle which of these buildings is of the earliest date, it will, I think, be better to take them nearly geographically, and commencing at the most northerly.

1. WHITTINGHAM CHURCH, NORTHUMBERLAND.

This church has a tower and the west end of the aisles and one arch on the north side, all appearing of the same early style. There are Norman portions, but they are clearly of a different and later date, and parts of the church are even later still with some modern mutilations.

The corners of the tower and exterior angles of the walls of the aisles are clearly of long and short stones of a very strong coarse gritstone, and the whole walling being of the same stone as the quoins, and no plaster required, the construction of the masonry is very conspicuous. The battlements and a part of the upper storey of the tower appear to have been altered; but the upper aperture has a rude baluster between the two windows, thus presenting two features, generally the most striking and constant in these early buildings. One arch of what appears to me to be the original nave remains; it is very plain, has a large rude abacus or impost and a plain square pier; it is now stopped and forms part of the vestry. The next arch eastward on the same side is a common Norman one, with the usual round pier and a capital, with a sort of bell and a square abacus. The remainder of the church is later, and of little comparative interest. The apertures in the tower have been much mutilated, yet those above have the baluster sufficiently clear to mark the style.

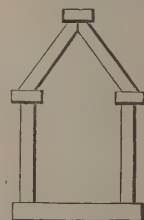
This church is situated about 300 yards out of the great road, and presents nothing attractive to the eye at a distance, nor do I believe it has ever been described.

2. THE CHURCH OF KIRKDALE, YORKSHIRE.

This church is also out of the road, between Helmsley and Kirby Moorside, in a valley near the celebrated Bone Caves. It is a small edifice, mostly of much later date. It has a stone on the south side with a Saxon inscription, but as this has been removed from its original place, it is now no evidence of itself as to what part of the church is Saxon; but as the western door, now stopped, and the arch to the chancel are both of them very rude, though in some degree resembling Norman, they may, I think, on a careful examination of them be considered portions of the old building.

3. THE CHURCH OF LAUGHTON EN LE MORTHEN,

between Sheffield and Worksop, is in Yorkshire, away from any public road; it is a fine church with a lofty spire visible at a great distance. The Saxon portion of the church consists only of a door on the north side, close to the western wall; it is evidently part of a more ancient structure, carefully preserved and surrounded with more modern masonry of very different stone, and is as clearly a long and short construction as Whit-



tingham or Barton. The church, for a country place, is a large one, and has a nave, aisles and large chancel. A portion is Norman, and this, as well as some more modern parts, is built



CHURCH OF LAUGHTON EN LE MORTHEN, YORKSHIRE.
Door in the Western Division of North Aisle.

of what appears to be a magnesian limestone, yellow at first, but growing a fine grey; the ancient door is, however, of a very different stone, being a dark red sandstone of a strong grit, whence obtained I do not know; but in the Norman chancel, intermixed with the grey stone, are several portions of the red sandstone built irregularly, as if portions of an older building, and on the inside are two niches—one evidently a seat with a plain sink and a semicircular head, and another, which seems to be a cupboard, with a straight arch top, but both of these are plastered and whitewashed, so that I could not examine of what stone they were constructed.

The later portions of this church are curious, for the Norman piers on one side of the nave are capped by a sort of upper square capital of Perpendicular work, which I have not seen elsewhere, and which is intended to raise those piers to the height of the piers on the other side of the nave, and from each spring arches of the same character corresponding with the later piers.

4. THE CHURCH OF ST. PETER AT BARTON-ON-THE-HUMBER, LINCOLNSHIRE.

This always goes by the name of the old church, and the other church, within a very short distance and called St. Mary's, the new church. Now no part of the new church is much later than A.D. 1300, and except the tower no part of the old church is so old as the year 1300; thus referring to the tower as the ancient part of the old church, and as the piers and arches of the nave of the new church are Norman, though rather late, it makes the old church of course as old as Norman, and from the circumstance of the belfry storey above the ancient tower being Norman—and certainly not late Norman—it gives a sort of *prima facie* evidence of a greater antiquity to the tower, and this evidence, and the complete difference from Norman in this tower, first attracted my attention and led me to look for similar ones in other parts of the kingdom.

This tower has the long and short quoin and rib stones, with the baluster window for what appears to be the original belfry storey before the addition of the Norman belfry. These rib and quoin stones project, are filled in with rough rubble walling and plastered. There is one door with a round arch, and one straight. The walls of the tower are thick, and there is no appearance of any staircase having ever existed. The church is mostly of a Decorated character. I consider this tower the most pure specimen of the long and short work, and particularly deserving of a visit from those who wish to see this style fully exemplified, and the Norman belfry is valuable from at once limiting the date of the tower to an early period.

5. ROPSLEY, LINCOLNSHIRE.

The long and short remains in this church are confined to a portion of the west end near the tower, and here also it is mixed with Norman work; a Norman north aisle appears to have been added.

6. THE EAST END OF THE CHURCH OF REPTON, IN DERBYSHIRE.

Here the long and short appearances are very small, only two ribs by the side of the chancel window, which is an insertion, but there is a crypt which is more like Roman work in some parts than Norman, and here are early Norman portions in the church, and all these portions are so blended with later work that it is very difficult to say where one ends and the other begins, but I have no doubt that some part of this church is of Saxon date.

7. THE TOWER OF THE CHURCH AT BARNACK, IN NORTHAMPTONSHIRE.

This tower has quoins and rib-stones like Barton-on-the-Humber, but the stones are more carefully squared and laid, and there are certain ornamental portions built into the walls, which give it a very different air to that of Barton, but it had no staircase, and to supply this want the lower storey was groined, and in one corner a circular staircase of early English date carried up within the square of the old tower. The arch into the church is curious from its singularly rude imitations of Roman mouldings in the impost and architrave. On the tower is a later belfry and a short spire.

This church is near Stamford, but not on any high road; it is a handsome structure, and deserving of attention, exclusive of the more ancient portion. It is built of Barnack stone, which seems to have been very extensively employed at one time, though the quarries are not, I believe, now worked. It is an oolite, in which are embedded numerous small shells, from whence it weathers very rough and open.

(To be concluded.)

THE MONASTERY OF ST. MARY DE PRÉS.*

THERE is nothing now but a slight unevenness of the ground, a little way down on the right-hand side of the Gorhambury drive, to indicate the site of the Benedictine nunnery of the Blessed Mary of Prés or the Blessed Mary in the Meadows, but it is surprising, considering the smallness of the monastery, to find so much documentary evidence as we do concerning it. From this I propose to sketch briefly the history of the monastery, and to attempt to show how the nuns lived and what they did. It is to be hoped that at some future time excavations may be made at the site and a ground plan of the buildings obtained, as there is so little at present known concerning the arrangement of these small English nunneries.

The story of the foundation of Prés, told by Matthew Paris, is as follows. A poor man of the town of St. Albans in 1178 had a dream in which St. Alban appeared to him and revealed the place of sepulchre of St. Amphibalus. Upon examining the spot indicated, the relics of the saint were found between two of his companions. As the relics were being brought from Redbourn to St. Albans, the monks of the abbey went out in procession to meet them with the shrine of St. Alban, and when the shrine of St. Alban approached the relics of St. Amphibalus it became so light that it could be carried by two brothers, "yea, even by one without difficulty," when at other times it was so heavy it could be scarcely moved, so strongly was the holy martyr attracted to his teacher and master. Some ten or twelve years afterwards a certain faithful man of Walden, we are told, while calmly reposing in deep slumber had a vision, in which there appeared to him a venerable cleric, bright as a ray of sunlight, who, upon being asked, stated that he was St. Amphibalus, the master and converter of Blessed Alban, protomartyr of the English, in whom he was well pleased and in whose glory he was gloried, and after referring to the attraction the place where his relics rested had had to the shrine of St. Alban, the visionary saint added, "Go, therefore, to Abbot Warin and tell him for me that the same place should be honoured with fitting reverence."

Upon the saint's messenger coming to the abbot and relating his vision, the abbot determined to honour the place by building there a church. And being apparently a man of impulse and energy, he within a very short space of time completed the buildings, endowed the monastery, put in the religious persons and instructed them in religion, lest any one should say of him that he commenced to build but was unable to complete his work. He dedicated the church to the Blessed Mary, and made John de Walden, son of the messenger of St. Amphibalus, the first master and proctor, who, although a layman, by preaching to the more simple he instructed many, and calling upon them to follow virtue, he refrained himself from vice. Abbot Warin having completed the buildings, put into them leprous nuns and restricted them within certain bounds, lest they should be entangled in the errors of the world, and kept

* A paper by Mr. William Page, F.S.A., read at a meeting of the St. Albans Architectural and Archaeological Society, and published in the *Herts Advertiser* and *St. Albans Times*.

them removed from the leprous men at St. Julians. It would appear from the wording of the Gesta that there had been both men and women at St. Julians.

By a charter dated September 15, 1194, the abbot granted to the monastery of Prés the place in which the church was built, together with the monastic buildings on both sides of Watling Street, certain procurations, the first and last loaf at every baking, license to grind corn at certain mills, thirteen old garments of the monks a year, and certain alms, corrodies, &c. He also provided that their chaplain should have daily from St. Albans Monastery a loaf of a monk and two measures of ale of the monks, and two dishes from the kitchen of the guest-house, and their clerk a loaf of an esquire and one measure of ale of a knight, and one dish from the kitchen of the guest-house; also that the same chaplain and clerk should yearly receive a mark from the church of Walden, and half a mark from the church of Newham. He also endowed the house with the tithe from the Lordship of Luton, and the tithe from the rent of the Stone House upon the wall of the cemetery of St. Albans, certain rents in Cambridge, pannage for pigs and provender for horses, a certain woodland called Coppedethorn, with firewood and some other tithes. The charter ends with the abbatial curse. If any one should presume to take anything from the abbot's gifts, let his name be erased from the book of life, and let him participate in the perpetual punishments with Judas the betrayer. Amen. As all the possessions granted belonged to the abbey of St. Albans, Abbot Warin was much blamed for impoverishing the abbey in order to found Prés.

King John, who is not usually accredited with very much liberality, was the greatest royal benefactor to St. Mary de Prés. On June 14, 1199, he granted to the church there the right to hold a fair yearly on the vigil and feast of the nativity of the Blessed Mary the Virgin, which fair was held yearly at Romelands, in St. Albans. Also on May 1, 1204, he gave the same church some sixty acres of land about St. Albans, and again on May 18, 1215, he granted a protection to the inmates of the house.

The next mention I have found in chronological order concerning the house of Prés is the consecration of the cemetery there, which service was performed by the Bishop of Down during the abbacy of William de Trumpington (1214-35). Under Abbot Warin's charter, Richard, the keeper of the house of Prés, on the death of Abbot Trumpington in 1235, claimed a corrody or a supply of meat and drink for one person, as had been supplied upon the deaths of former abbots, which was granted to him. About this time the house of Prés appears to have become very poor and the buildings dilapidated, so that in the account given in the Gesta of the visitation of the Bishop of Norwich, by order of the Pope and Henry III. for the taxation of the tithe to be granted for the Crusade, it is described as the church of St. Mary de Pratis, where the poor women scarcely have the necessities of life. Possibly at the intercession of this bishop, Pope Alexander IV. came to the assistance of the house and issued a bull in 1255, granting forty days' indulgence to such persons as should contribute towards the repair of the buildings, and again in the two following years similar bulls were issued.

I have seen no record relating to the house of Prés for nearly a hundred years after this date, and as about the middle of the fourteenth century there commences a series of the accounts of the priory made up yearly and preserved at the Public Record Office, which illustrate the life within its walls, it may be well to digress here from the chronological order of events, and consider how the inmates of Prés lived. First with regard to the buildings, as there are now no indications of the positions of any of these, I cannot lay before you a ground plan, but, speaking generally, the plans of most nunneries were similar, adapting themselves, of course, to local requirements. There was the cloister, around which the various buildings ranged. The church was usually to the north, running, of course, east and west; the chapter-house on the east side, with probably a parlour or hall adjoining, and over these was the dormer or sleeping apartments; on the south was usually the frater or dining-hall, and on the west were the guest chambers, kitchens, &c. Mr. William Brown, in a paper upon some small Yorkshire nunneries, which he contributed to the *Yorkshire Archaeological Journal* (vol. ix.), states that most of the chambers were comfortless abodes, plastered inside and weather-boarded out; few of them had fireplaces, and in some cases the windows were unglazed and were placed with an utter disregard of what was under or above them. The cloister-walk or ambulatory was sometimes glazed in the Yorkshire priories. With reference to Prés, I have found mention in the accounts before referred to of the church with the chancel of the nuns and sisters, the cloisters, the chapter-house with the great solar over it, the chamber of the nuns, the house of the sisters, the aumbry, the great hall, the red hall, the dormitory, the chamber of the guest-house, the frater, the hall of the prioress, the wardrobe, the rere dormer, the kitchen, the laundry-house, the stable, the dove-house, the cemetery of the nuns and sisters, the garden, &c.

The buildings had apparently all of them tiled roofs, and the windows were all glazed. There appear also to have been fire-places in the dormitories, as there are items for coals to be expended there. The monastery was possessed of a clock, the cost of the repair of which occurs in the account for 1461.

Concerning the inmates of the buildings we obtain some little information from these rolls of accounts. At first the house was ruled by a master, and was merely a hospital for leprous women, but as leprosy died out in this country it became purely a monastic establishment. The masters or wardens continued to manage the affairs of the priory till the middle or end of the fourteenth century, and afterwards, to the dissolution of the house, the direction of all the affairs devolved upon a prioress as in an ordinary nunnery. I find, however, in the bulls of Pope Alexander IV. on behalf of the priory as early as 1255, and in the early accounts, mention of the Prioress of Prés, at the same time as the house was under the rule of a master. At the time of the foundation of the hospital the inmates consisted apparently of only leprous sisters, with probably a professed superior to take charge of them. Shortly afterwards, however, there were two classes, namely, nuns and sisters, and these continued down to the abbacy of Thomas de la Mare, of St. Albans, whose sister Dionisia, as she is called in the Gesta, or Alice in the accounts of Prés, became a professed nun of this house in 1342, when she paid 2*l.* at her entry. This lady from the position of her brother probably became prioress, and shortly after he was elected Abbot of St. Albans, Thomas de la Mare altered the constitution of the house, doing away with the remains of its character as a hospital and making it purely a nunnery. He ordained that the sisters, the successors of the leprous women, should become nuns, and from thenceforth no more sisters should be received. And whereas the greater part of the nuns had been illiterate and so unable to say the services, he ordained that the then present and future nuns should learn to read, that they might say the services at the canonical hours, and for this he gave them six or seven ordinals from the Monastery of St. Albans. He further commanded that from thenceforth all the nuns should profess the rule of St. Benedict in writing, in the presence of the Archdeacon of St. Albans or a monk to be appointed by the abbot. It is about this time—viz. in 1357—that there is the last mention I can find of the master or warden of the house, and the prioress takes his place in all deeds and charters, and in the control of the monastery and all its possessions, and this was the date I fancy at which the house was changed from a hospital to a nunnery.

DISCOVERIES IN EGYPT.

EVERY season, says the *Times*, brings more spoil of the Egyptians, and it is always the unexpected that we must expect. A private tomb gave up the kings of Thebes; the vaults of a priestess of Hathor were found filled with mummies of priests of Amen. Priceless scraps of literature have been recovered from cheap *papier-mâché* coffins, and farm-accounts have been known to bear a lost poet on their reverse. The latest surprise is that in a Memphite tomb, rifled ages ago, hard by a pyramid, supposed to be of the sixth dynasty, has been discovered a royal treasure of the twelfth.

The pyramids of Dahshur rise on the left as one rides to the Memphite necropolis at Sakkara, the nearer one being a formless mass of brickwork, almost cut in half by treasure-seekers, and buried deep in drift. No royal chamber has ever been found in it, and M. de Morgan, the present director-general of the Service of Antiquities, conceived the idea that it might be only an enormous *mastaba*, built above the royal tomb. He began, therefore, in February last to dig about its roots in the hope of hitting the mouth of the shaft by which the burial must have been introduced from outside. The desert all round the pyramid base was found full of tombs, square-bricked shafts descending from ruined *mastabas* to the grave-chambers. All had been rifled, and nothing of interest resulted at first but sculptured slabs and *stèle* from the *mastabas* and Canopic jars and chests. From the foot of one shaft, 30 feet deep, a winding passage, roughly hacked, was found leading into the bowels of the rock. Groping on, the explorers debouched into a vault, nearly filled by a fine sarcophagus inscribed with the name of Nefert-Heut, a queen. Alas! it was broken and empty, rifled by the same hands that had cut the passage. A door, however, led into another gallery, in this case no thieves' work, but an original part of the tomb. It was straight for a long distance, chambers opening on the left, each with rifled sarcophagi and Canopic chests. The furthest group of vaults yielded the name of a princess, Seut-seubetes, but was apparently as empty as all the rest. M. de Morgan, like Schliemann, is not content till he has reached rock, and therefore set his men to pick over the floors, expecting no reward beyond the credit of clearing a fine tomb, structurally interesting, though completely void. In the floor of a passage in the group of chambers belonging to the princess the picks encountered a patch of soft earth. A few

inches lower the remains of a silver-encrusted box were disclosed, and piece by piece below its crumbling lid was found the first instalment of the treasure of Dahshur. A long necklace of amethyst beads, a second of amethyst, turquoise, carnelian, *lapis lazuli* and gold, a kohl-pencil in exquisite gold-bead work, a bunch of gold rose-petals, three finely-cut *scarabæi*, the gold face of one bearing the royal name of Usertasen III., couchant lions and other tiny pieces in gold; these were all admirable, but eclipsed by two objects in mosaic-work, namely, a pendant or brooch shaped like a lotus and set with *lapis* and carnelian, and a royal pectoral, on which two crowned hawks support the cartouche of Usertasen II. The plumage is in stripes of *lapis* and turquoise, the symbols of the royal name in these and carnelian; the whole is set in gold and worked on the reverse to represent the same scene as the front. Whether for purity of design, exquisite colouring or absolute finish it equals any piece of jewellery in existence. It would be a *chef-d'œuvre* of the goldsmith's art of to-day; made 4,500 years ago it is a miracle.

A few yards further along the passage was found a second box hidden like the first. Two large pectorals were in it. On the first, two figures of Amenemhat III. smite the Asiatics; the design is crowded and less pleasing than the pectoral of Usertasen II., though the mosaic of stones and gold is not less finely fashioned. On the third pectoral two hawk-headed apes beneath the cartouche of Usertasen III. trample on prostrate men. Nothing for sheer finish excels this piece in the whole treasure. For the rest, we can only give a catalogue of the most beautiful contents of the box. There were large cowrie-shells of gold, pestle and mortar in gold and *lapis*, rings with beautifully graven *chatons*, necklaces of amethyst and carnelian, large rose-petals—one with a wonderful mosaic centre—mirrors with gold handles, gold lion masks, and a second kohl-pencil adorned with a pattern of gold beads, soldered on one by one, a marvel of delicate work. There is not a single object in the treasure not remarkable; the whole can be fitly compared only to Schliemann's find in the circle graves at Mycenæ.

Why were these treasure-coffers so hidden, and who hid them? Perhaps the legitimate owners, fearing spoliation; perhaps robbers waiting for a favourable moment to carry them away. So cunningly concealed were they that the chief wonder is how they were ever found at all; and M. de Morgan's discovery of them will assuredly rank among the most remarkable successes in the records of explorations. He is digging still for the royal chamber, but up to the present moment the pyramid has preserved its secret inviolate.*

The most considerable excavation carried out during the past season in Egypt has been that of the Exploration Fund in the temple of Queen Hatasue at Deir el Bahari, near Thebes. If M. de Morgan has revealed a treasure, M. Naville is bringing to light a temple. The unique pile of buildings which the Queen erected and adorned to serve as funerary shrine for her father, her husbands and herself, has been almost entirely buried for ages between earth-slips and the *débris* of a Coptic convent. Thirty years ago Mariette laid bare a small portion, and enriched the world with the famous wall pictures of the Queen's naval expedition to the land of Punt, but the rest was left under mountains of rubbish till last season. Thanks to the Egypt Exploration Fund, the whole of this beautiful monument of the greatest period of the empire is now in process of being exhumed and restored. It is built on three terraces; the upper was cleared almost entirely last season, and among other things a unique high altar was laid bare, and a side of a magnificent ebony shrine of Thothmes II. discovered. The latter is now mounted between glass at Ghizeh, and is the finest piece of ancient woodwork in the collection.

Both this season and the last many hundreds of blocks have been recovered, sculptured with the Queen's exploits, her wars and the transportation of her obelisks from Syene. So long buried, the colouring of these scenes is as vivid as their execution is admirable, and they will bear comparison with any work of the eighteenth and nineteenth dynasties, even that of Seti I. Abydos. During the past winter the middle terrace also has been cleared in great part. A fine colonnade, a hypostyle hall with brilliant paintings, and a portico adorned with scenes relating to the Queen's birth have been opened once more to the light of day. The portico reliefs have a peculiar interest as being apparently originals of the famous scenes in the temple of Amenhotep III. at Luxor, in which his relation to an immortal father is portrayed. In clearing so large a space many small things must always be found, and in this instance there has been a large find of ostraka, hieratic, demotic and Coptic, of blue scarabs and amulets of the famous local ware. The work is to be resumed next season, and when all is done the Egypt Exploration Fund

will have the credit of having restored to the world one of the most singular and beautiful monuments of antiquity.

Thirty miles lower down the river Mr. Flinders Petrie has met with his usual success at Kuft, the site of ancient Coptos. His marvellous instinct of discovery led him to select the temple site which lies in the midst of the Roman city, and, turning over the *débris* from end to end, he has found most interesting remains of the worship of Khem in all periods. In the foundation-sand of the Ptolemaic restoration he lighted on three *colossi* of the god, so strange and rude in style that he supposes them to be almost prehistoric, the work of the first immigrants from Arabia before Mena founded the first dynasty. Carved on them in low relief are symbols, shells and animals, whose style may help to fix their period. A lively discussion is likely to arise, and we may expect to hear them referred to every date from that of the Arabian immigration to the occupation of Coptos by the Blemmyes after our era. Other finds of Mr. Petrie's, however, go back far enough. A fragment of alabaster bore the cartouche of Khufu of the fourth dynasty, and slabs of a pavement of Thothmes III. showed on their reverse sides scenes from the temple of the eleventh dynasty, unfortunately very imperfect, for they are the earliest temple sculptures known. A door-jamb was carved with the finest work of Usertasen I. of the twelfth dynasty. Foundation deposits of the eighteenth, a triad and *stela* of the Rameside period, pottery of all the dynasties from before the pyramid builders to the Roman, make up with many odds and ends a find equal in interest to any that Mr. Petrie has ever made, except perhaps at Naucratis. We may mention also that a remarkable Roman inscription was found at Kuft shortly before Mr. Petrie's arrival, giving a list of tolls to be paid at the Red Sea gate of Coptos.

A very important symptom of the past season has been the awakening of interest in ancient Alexandria, and we shall probably hear a great deal about the Ptolemaic and Roman capital in the future. It is the unexplored site in Egypt, and it is really astounding that we should know so little of what was once the first city (and has always been among the first) on the Mediterranean. The meeting-place of so many races, bound up with Jewish and early Christian history, an unrivalled centre of culture, the burial-place of the greatest of ancient conquerors and of a long line of his successors, the most singular and favoured city in the Roman empire, Alexandria has limitless possibilities. The ancient city lies deep under the modern, but now that the Municipality is favourable, the new museum has been organised, and persons of local influence are at work, we may hope that an exploration has been begun which will prove of extraordinary interest, if carried through.

Odds and ends of work there have been many. The beautiful temple of Kom Ombo has been rescued by M. de Morgan from the wash of the Nile, and, albeit a little too thoroughly swept and garnished, presents a very fine appearance. Members of the French mission have copied its inscriptions throughout, and the plates will appear shortly in the publication of "Unedited Monuments," promoted by the director-general. Mr. Sayce has been exploring Nubia, and finding forts and graffiti and *stela*, whereof he has given account in the pages of the *Academy*. Dr. Hess has been searching the same shores for demotic texts, but the result of his labours is not known. Captain Lyons, R.E., has brought back much information and some antiquities of note from the Oases, and Mr. Bloundell is about to explore the Temple of Ammon at Siwah in the course of a wild and difficult journey which he hopes to terminate in the Cyrenaica. Messrs. Tyler and Somers Clarke are continuing their work at El Kab.

EGYPTIAN DECORATIVE ART.

A COURSE of lectures on "Egyptian Decorative Art" has been commenced by Dr. W. Flinders Petrie at the Royal Institution, London. He said that bounds must be set to a study which might be made to embrace almost every example of ancient work known to us in the land. The Egyptian treatment of every object was decorative, and these lectures must be limited to the historical development of the various motives or elements of decoration, notwithstanding the temptation to examine the historical connection of Egyptian design with that of other countries. The love of form and drawing was perhaps a greater force with the Egyptians than with any other ancient people. The Babylonians and Chinese had, like them, a pictorial writing; but while these dropped that for easier abbreviation, the Egyptians never lost sight of the original picture, and although the current hand altered much, for 4,000 or 5,000 years the true hieroglyphic representations were maintained. These were also decorations; their position was ruled by their effect as a frieze, like the beautiful tile borders of Cufic inscriptions in Arab architecture, and inscriptions are never cut across figure-sculpture as in the barbarous custom of Assyria, and signs were often transposed in order to group them harmoniously in a graceful scheme. The consequence was the most beautiful writing that ever existed, and the Egyptian

* The total number of pieces in gold found in this tomb was 165, besides 240 beads of amethyst, 70 beads of emerald, *lapis lazuli* and carnelian, and a larger number of smaller beads of various precious stones. The total weight of gold pieces found was 314½ grammes.

became the father of the world's ornament; while in the adaptation of scenes of peace or war to the gigantic wall-surfaces of pylons and temples he has never been surpassed. The question of the origination of patterns at one or more centres has been as much disputed as the origin of man from one or more stocks; but we have less evidence of re-invention than of copying. Weaving and basket-work have influenced the uniformity of patterns in different countries. Mr. Goodyear has brought together much evidence of this descent of design along the well-known historical lines of intercourse. On a less scale this is to be seen in the prehistoric bronzes of Upper Bavaria, in which the designs are partly Italic, partly Mycenaean. We can see a source for most of our familiar elements of design in the decoration used in Egypt long before any example is known out of that land, and therefore we must study Egypt itself. Four divisions may be made of these elements—the simplest geometrical ornament of lines and spirals and curves; the natural ornament of copying feathers, flowers, plants and animals; the structural ornament arising out of architecture; and lastly, symbolic decoration, like the globe and wings, the scarabs, or the various hieroglyphs. As to geometrical decoration, one of the simplest is the zigzag line, so simple that one is astonished to find, as to two of the easiest modifications of it, that the waving lines instead of angular waves are not found till 1500 B.C., and the zigzag with spots in the spaces is as late and generally foreign to Egypt. This use of spots for filling in corners we first see in the garments of Amu or people of Northern Arabia in the twelfth dynasty, up till when no spot is seen except for the centre of a square; but the Amu dresses are covered with spots in every space, and even along the bars and stripes of colour, and it is so also with the Phœnicians or Kelts. This use of dots is a foreign or Asiatic element, akin to the filling in of spaces on early Greek vases with rosettes and other small ornaments. When the zigzag line came to be used on metal-work or pottery, then curves were readily introduced. On a golden bowl repeated waves are shown deepened so as to receive further figures. The spiral or scroll is one of the greatest elements of Egyptian decoration, only second to the lotus in importance, to a development of which some have attributed it, and it has been said to represent the wanderings of the soul. The older group of spirals are the scarabs, the others those continuous patterns on ceilings, furniture, &c. The earliest scarab which can be dated is one of Assa, of the fifth dynasty, on which a bordering line is interrupted at the ends and turned in to fill the space on either side of the name, and this is a frequent case until the twelfth dynasty, in which any continuous spiral design is first to be observed. Those spirals may be described as coils, hooks, links, chains; but when the same line is maintained unbroken it is a continuous spiral of all varieties of coils, hooks or links. The spiral was developed apparently under Usertasen I. into a chain of coils drawn with great beauty and regularity, showing the design to be a novelty, and in no later reign were spirals ever so beautifully and perfectly executed, although the type was revived under Amenhotep II. In the twelfth dynasty it was combined with the lotus in perhaps the most perfect design that remains on any scarab, a continuous coil with flowers and buds in the spaces. After serving as adjuncts to inscriptions the spirals became elaborated as sole patterns, at first with a few simple coils, and then elaborated with more coils or links, sometimes to a great length. The difficulty of designing good covering patterns out of true continuous lines probably led to the introduction of false links, and thus what would have been an opening in the middle was barred across, some beautiful effects being obtained by this false barring. The next stage is where continuous lines of spiral pattern are placed side by side and other patterns developed in the space between them. Sometimes the intervening patterns become so complex as to overshadow the mere spirals, as in the splendid ceiling of Neferhotep in the eighteenth dynasty. But the glory of Egyptian line decoration was in the quadruple spiral, of which the most elementary example is on a boat cover as late as the twentieth dynasty (Rameses IV.), though it has passed through this stage long before, unless this be regarded as a degraded simplification of it. From this was developed a peculiar pattern by the omission of the lines which define the spirals, reducing it to a system of rows of hollow-sided quadrangles without apparent connection. Then by introducing link lines so as to form a quintuple spiral, which was still more complicated by lotus flowers and buds in the hollows and recesses. Here the Egyptians had reached the limit beyond which more detail would be merely confusing. By careful use of colour to separate the various parts these complex patterns remain clear and pleasing in spite of their richness of detail. Another development of the quadruple spiral was formalising it into a torturing kind of design which can only be described as "cursedly ingenious." The fret patterns are all modifications of corresponding spirals, the cause of each change being obviously the influence of weaving. As early as the fifth dynasty we have a fret of rhombic form in basket-work in the screen behind the figure of Ptah-tanefer at Gizeh. The angles show that the plaiting was in

three directions; as is found in the basket-work pattern at Beni-Hasan. But frets in general are very rare until a late period, and doubtless depend on the adaptation of spirals to textiles. There is no trace of fret in the Mycenaean art, the spiral there being figured on stone or metal, while the women wore flounced dresses with scale pattern. But in the pre-Persian age fret-pattern weaving in borders was the standard design, as we see on the coloured robes of the Parthenon statues, and immediately after that the stiffness of square frets swarms over Greek art, to the exclusion of the graceful spirals and scroll borders. The source of chequer patterns is unmistakably in plaiting and weaving. On the oldest monuments the basket sign, *neb*, is chequered in different colours, so are also the baskets of farm produce carried by the servants as shown in the tombs. The modern Nubian basket-work is well known for the many patterns. The chequer pattern is found in every period in Egypt, and is perhaps most common in the latest forms on the sides of thrones in the Ptolemaic age. In the Middle Kingdom we find chequers covered with bars of colour, red and green at Beni-Hasan. Somewhat analogous are the network patterns, of which a fine example is on a horse-cloth of Rameside age. This design rose to importance when introduced as an architectural element in the decoration of columns at Tel-el-Amarna, coloured yellow, and the spaces alternate red and blue. Professor Flinders Petrie concluded by saying that the Egyptians had evidently no compasses, but used the string and points. The absence of a simple and self-evident motive like the sixth of the circle is very striking.

GENERAL.

Mr. John Morley, M.P., has been elected a trustee of the British Museum, in succession to the late Lord Bowen.

Mr. J. W. Clark, M.A., will, on the 13th instant, deliver the Rede lecture on "The Position, Arrangement and Fittings of Libraries during the Middle Ages and the Renaissance, with special notes on the system of Chaining Books," at Cambridge.

The Jury of selection for the forthcoming annual exhibition in Munich will consist, for architectural designs, of Professors A. & F. Thiersch, Hauberisser, Seidl, Von Schmidt and Bühlmann.

The Plans received by the Metropolitan Asylums Board in competition for the proposed fever hospitals at Hither Green and Tooting Graveney will be on view until the 6th inst. at the Imperial Institute.

Mr. H. A. Reid, in conjunction with his partner Mr. Green (both of Johannesburg), have obtained the first premium of 200*l.* offered by the Cape Town Council for the erection of a new town hall. The contemplated outlay, not including the upper part of the clock tower, is 50,000*l.*

Lord Mostyn has given a piece of land for the erection of a church in memory of the late Duke of Clarence at East Llandudno. Lady Augusta Mostyn has also given a donation of 1,000*l.* to the same object.

The Conversazione of the Society of Arts will take place at the Imperial Institute on the evening of Friday, the 22nd inst.

The Royal Archaeological Society will meet in Shrewsbury at the end of July next for their annual conference.

The French Archaeological Congress opened in the Town Hall at Saintes on Tuesday. About one hundred delegates were present, including several from Great Britain.

The Council of the Society of Arts offer a prize of 25*l.* for the best design for a silver cup. The design, if adopted, will be used for the Swiney prize for "The best published work on Jurisprudence." The value of the cup is 100*l.* The offer is open to all students of schools of art in the United Kingdom. Competing designs should be sent in not later than December 31, 1894.

Mr. Val Prinsep was, on Monday, elected a Royal Academician in succession to Mr. E. Armitage, who has joined the Retired Academicians.

The Scottish Society of Painters in Water-Colours have elected the following artists as honorary members of the Society: Joseph Israels, James Maris, J. M'Neil Whistler and Sir Edward Burne-Jones.

Mr. J. C. Rogers, secretary of the Surveyors' Institution, has been presented with a service of plate and a purse of 400 sovereigns, in recognition of his long and devoted services.

Mr. G. T. Brown, of Sunderland, having obtained the first prize in the competition for the Board School in Hudson Road, Sunderland, has been entrusted with the carrying out of the building. The second prize was gained by Mr. J. Eltringham, and the third by Messrs. Oliver & Leeson.

Sir R. Rawlinson was, on Tuesday, elected president of the Institution of Civil Engineers, in succession to Mr. Alfred Giles.

Mr. C. Barry has prepared plans for the new building of the Institution of Civil Engineers, and it is expected the work will be commenced early in the forthcoming recess.

The Architect.

THE WEEK.

AN ingenious attempt to nullify one of the most essential provisions of the Metropolitan Building Act was witnessed in the Queen's Bench Division on Monday. For thirty years police magistrates have had the power to order the demolition of structures that are declared to be dangerous by the proper officer or surveyor. When a case of the kind, relating to ten houses, came lately before the magistrate at Wandsworth, the point was raised that he could not make the order because it had not been shown that the brickwork in question was dangerous to passengers or passers-by. That it was dangerous to the inmates of the houses was assumed to be of no account. The magistrate declined to adopt that interpretation, as it would stultify his own decisions, for hitherto he had made the orders when it was testified that buildings were dangerous. He also declined to state a case. Application was accordingly made to Mr. Justice CAVE and Mr. Justice COLLINS for a mandamus to compel the magistrate to state a case. Their lordships upheld the magistrate's view. Taking the Act as a whole, they found that it comprised buildings that were dangerous to the inmates as well as to passers-by, and the argument that shoring was intended to assure the safety of the latter was met by saying that the protection was an *ad interim* one, while the structure was being taken down.

THE Society of Architects will this year visit the Rhine district and Bavaria. The members will leave London on July 27, and the first part of the excursion will comprise visits to Cologne, Andernach, Boppard, St. Goar, Mayence, Worms and Heidelberg, which will be reached on August 4. In the second tour Wurzburg and Nuremberg will be seen, and the return will be *via* Cologne, the party arriving in London on August 14. The price of a ticket for the first ten days, which will free the holder from London to Heidelberg and back, including second-class rail, first-class boat, and good hotel accommodation, will be 10*l.* 10*s.* A ticket for the seventeen days' tour will cost 15*l.* 15*s.* The prices are very moderate. As each member can introduce two friends, ladies or gentlemen, the excursion is likely to be enjoyable. The district selected contains many varieties of buildings, which should be seen by all architects, and the greater part of the country traversed is picturesque.

THERE was a meeting of the trustees of the National Gallery held on Tuesday, when the following resolution was passed:—"The trustees of the National Gallery cannot permit Sir FREDERIC BURTON's resignation of the directorship to pass without recording their high sense of the eminent services which he has rendered to the Gallery during the time that he has held that office. The trustees owe to him some of the most valuable additions that have been made to the collection, such as the Blenheim Raphael and the Holbein and Velasquez from Longford Castle, besides many other examples of artists previously unrepresented in the Gallery which are too numerous to record—additions which have placed the National Gallery amongst the first collections in Europe. By this arrangement of the pictures according to their schools he has added greatly to the usefulness of the gallery as a means of public instruction. The catalogue which he has compiled of the contents of the gallery, from its literary merits and knowledge of art history, has made it, perhaps, the best of any European work of the class. The trustees desire that a copy of this minute should be communicated officially to Sir FREDERIC BURTON." This tribute to a zealous officer was no more than was deserved, and it is well it should be put on record, for the late director of the National Gallery was not disposed to make the world acquainted with his labours.

THE scheme for the establishment of a school of architecture and applied arts in Liverpool is becoming more definite. It is proposed to constitute a special Board, formed of representatives of the City Council, University College, the Architectural Society, the Academy of Fine

Arts, the Master Builders' Association and the Building Trades Federation. The professor of architecture who is to be the director of the school is also to have a seat. The Board will have charge of the organisation, and make arrangements for establishing and upholding studios with teachers for modelling and sculpture, including carving in stone and wood, for mural decoration and glass-painting, metal-work, plaster-work, and any other art that is subsidiary to architecture. The courses of instruction on architecture will be given in University College. If considered requisite, classes will also be opened for teaching such industrial arts as pottery, goldsmith's and silversmith's work, bookbinding, typography, engraving, etching and lithography. As regards finance, it is understood that the Roscoe Professorship of Fine Art can be made part of the organisation, with of course the present income. Accommodation for the professor of architecture and his classes would also be provided in University College. Besides, there would be a revenue from the students' fees, the grants of the Science and Art Department, and the City Council. After allowing for all the money that would be likely to be obtained from those sources, it is calculated that 1,000*l.* a year would have to be provided from the rates. The technical instruction committee of the City Council are responsible for the scheme, and it obtained its endorsement by a vote of the Corporation on Wednesday.

THE Congress of the Union des Arts Décoratifs in Paris occupied no less than twelve days, apparently a long period if measured by the results. One of the resolutions adopted will, however, change the character of the society. It has been hitherto under the control of amateurs, and hence it was that so many efforts were made to set up the museum at a remote distance from the industrial quarters, where the examples could be turned to account. Henceforth designers, members of employers' syndicates and others engaged in manufactures can join the Council, but it remains to be seen whether they will care to give their support to an institution which must be pronounced to be a failure. What is necessary is the withdrawal of all the amateurs from the Council. The Congress expressed regret at the extent to which imitation is now carried on in French industrial art. As a remedy it was proposed that the Government should offer commissions for the decoration of public buildings, and for designs of other kinds, in which novelty should be declared to be indispensable. For that purpose it was proposed that special grants of money should be voted, and that the arrangements should be entrusted to competent men, who need not be officials. It was likewise recommended that in the public museums examples of art should not be placed in obscurity in order to make room for curiosities which are not interesting from their form or colour.

TWENTY-TWO sets of plans were delivered in the competition for the asylum at Winwick, near Warrington, which is to be erected by the Lancashire Asylums Board. The three which Mr. HOWELL, the assessor, considered as most deserving are those by Messrs. GILES, GOUGH & TROLLOPE (estimated cost 258,909*l.*, or 129*l.* per bed), Mr. G. T. HINE (222,164*l.*, or 111*l.* per bed) and Messrs. CRISP & OATLEY (300,200*l.*, or 115*l.* per bed). They will be considered by a committee of the Board. The premiums are 200*l.*, 150*l.* and 100*l.* The buildings are to accommodate 2,000 patients (chronic lunatics and imbeciles), namely, 1,000 males and 1,000 females, with administrative offices. Provision has also to be made for receiving-wards to accommodate 50 excited patients of either sex and 200 sick and infirm of either sex. The architectural character of the building (which, it was suggested, should be simple and without superfluous ornament), as well as the grouping of the parts on the plan, was left to the architect. The chief points upon which the Board insisted were soundness and economy of construction, with completeness but simplicity of design, economy with reference to working and supervision, convenient arrangement of internal communications with regard to levels, &c., and a general conformity to the instructions and suggestions for the construction of asylums issued by the Commissioners in Lunacy.

ARCHITECTURAL ESSAYS.—II.*

IN his second essay, "Conscience in Architecture," Mr. VAN BRUNT treats a theme which is closely related to the subject which gives the title to the volume. He does not, of course, mean to hint that fees are sometimes excessive or that builders are allowed too much laxity in creating extras. By conscience he recommends something corresponding with the exploration of their interior world, that darkest of continents, which good people periodically undertake, and as they believe with advantage to themselves. In a process of that kind there must be a moral standard. Suppose a man sets before him the example of a neighbour who at all costs keeps a good cook, a carefully-selected cellar, and is faithful to the duty of frequently collecting friends and acquaintances at his table, it is easy enough for a lover of virtue to test how far he corresponds with so excellent a model. But if he set up soon afterwards another virtuous man for imitation, who believed that digestion and economy were aided by solitude, and that good dinners shortened life and weakened the ethical sense, our neophyte's progress along the path of virtue would be erratic. Mr. VAN BRUNT believes that architectural progress is also hindered when there is not fidelity to one standard. According to him, "the Greek architect of the time of PERICLES had before him a fixed and sacred standard of form," the Mediæval builders had also their revered patterns, and "so it was even after the period of the Renaissance." But of us it is said how in our degenerate days "at the same moment we are designing and painting Greek vases, decorating Japanese screens, constructing furniture according to our reminiscences of the Gothic of the EDWARDS, or the Renaissance of the JAMESES, of Queen ANNE, or of the GEORGES," &c., and "it would seem, in fact, as if our knowledge, our ingenuity, our industry had swamped our art." Mr. VAN BRUNT therefore concludes that we require "the establishment of principles, and not forms, as standards of excellent work," and a recognition of the fact that "the very finest result of high culture, in architecture as in literature, is to utter thought with simplicity."

It seems to us that, in longing for the return of vanished ideals, Mr. VAN BRUNT is not an exponent of the American idea. His countryman EMERSON was more expressive of it when he said "dedication to one thought is quickly odious." We can never have the conditions of life which prevailed in Greece and in Mediæval Europe. The artists of those days might be described as mentally belonging to a ruminant class. Their horizon was circumscribed, and they could calmly and placidly keep on revolving a few thoughts or fancies. In an age when the great globe itself is not considered large enough to satisfy human inquisitiveness, and the light from stars millions of miles away is analysed as prosaically as if it had something to do with an obstruction case in a City alley, men cannot be expected to have "a sacred standard of form" any more than a sacred star-spangled banner or a sacred schedule of import duties. We are all only a sort of flotsam and jetsam on the waves of time, and we cannot resist the impulse which keeps us floating. When so many things are unstable, how can it be expected that architecture alone is to remain unmoved? Or, to put the case in other words, it may be said that earlier in the century science was satisfied with examining the phenomena of the world that is external to man. Now it is man's turn to be investigated. All his beliefs are put under the microscope. It is no longer enough to say that forms must be adopted because they were held sacred by Greeks or monks. Their fitness for common wants must also be demonstrated as well as their omnipotence. That is a slow operation, and until it is accomplished fancy may well be allowed to find enjoyment in dallying with forms which are attractive because they are not sacred. At some future period there may be more wisdom, and architecture, like ULYSSES, may have a spell of the "soft serenity of age," and a return to old beliefs or superstitions, but at present there are no signs of it. Before it is reached men will probably have to discover that universality is a delusion, like many others in art.

His conclusions lead Mr. VAN BRUNT to consider the influence of the personal equation in architecture in another

essay. Unfortunately, there are not enough materials for the investigation of a question of that kind. To comprehend the personal equation we must know something of the lives of architects, and that knowledge is not forthcoming. The most that Mr. VAN BRUNT can say is that the decorative or ornamental part of buildings sometimes varied according to periods with which the names of certain kings and queens are associated:—

When architecture had ceased to be a structural evolution, and was based upon a formula of pilasters and entablatures, enclosing impostes and arches, decoration or ornament assumed a function until then unknown, and there was a distinctive style corresponding to the character of each reign, often contrasting with curious abruptness. Thus we recognise a style of Francis I., free, elastic, poetic, romantic; of Henry IV., bold, coarse, grotesque; of Louis XIV., full of grandeur without, of pomp and splendour within (Viollet-le-Duc has called it "the New Renaissance"); of Louis XV., frivolous, licentious, ostentatious, rococo; of Louis XVI., decent, orderly, pure to prudishness; of the First Empire, a theatrical display of imperial Roman proprieties, meagre and tarnished; of the Second Empire, elegant but profuse and luxurious, drawing its *motifs* from every historical source, but harmonising them with a fastidious, academical spirit, not unconscious of the purifying and ennobling influence of the newly-discovered Greek principles of art—a style of to-day, too near us to be recognised now in just perspective, but for which our French contemporaries will be held responsible in the next century. So there is a style of Elizabeth, of the Tudors and Stuarts, of Mary, of Anne, of the Georges and of Victoria. So also in Spain the enthusiasm, the efflorescent splendour and pride of Ferdinand and Isabella and of Charles I. are clearly expressed in the joyous and sunny exuberance of the architecture of their times. But in the time of Philip II. there was promptly substituted for this brilliant manifestation a cold, academical formalism in full sympathy with his iron rule.

The personal equation, which consists in a general combination to produce a style that will be more or less gratifying to a ruler, is not a surprising exercise of individuality. In all times it would have been easy for a critic to complain that architects were running in one groove. If it were otherwise there would be no chance of becoming acquainted with the history of styles. The varieties of buildings are comparatively few, because there was always a tacit understanding that it was better for everybody to restrain inventive power. The old Greeks, as well as the English architects of the nineteenth century, accommodated themselves to that view of duty. Mr. VAN BRUNT, who would gladly support 'originality and the utterance of thought with simplicity, is compelled to own "that the present and future architecture of all civilised nations must, unlike that of all primitive peoples, express not so much the natural man as the artificial or conscious man." He might have added that as man must be considered not only as an artificial or conscious individual, but as a mere unit in a multitude, he has a double set of duties to perform, and that when he is building he would often do well to generalise his occupation, and in that way express the common tendency of his contemporaries.

The next essay in the volume has the Château of Blois for subject, and contains an excellent summary of the lessons which can be derived from that valuable work, which represents the transformations of architecture during five centuries. We lately published some large photographic views of the buildings, including the beautiful open staircase, which Mr. VAN BRUNT describes as "a useless *chef-d'œuvre*, which never could have been built in a settled and serious age; but the joyous new birth and enfranchisement of the mind, which were then filling all the corners of Christendom with inspiration and light, could not have their due record in architecture with any less ebullient demonstration."

The essay on the "Present State of Architecture" corresponds with a great many others on the subject, which seem to be inspired by the man who travelled from Dan to Beersheba, and found it all barren. A sort of exception is made in favour of French work, but we are told "its blossoms invariably die in crossing the English Channel, and when imported to this [the American] side of the Atlantic, there is little left of it but branches and withered leaves." In England Mr. VAN BRUNT considers we are too much given to reviving completed systems which can be adapted to new uses without much change of the old characteristics. But is not all evolution a transformation from one form of completeness to another, just as the kaleidoscope patterns are made to change when most perfect? The only rational theory of Gothic is that which

* *Greek Lines and Other Architectural Essays.* By Henry Van Brunt. Boston and New York: Houghton, Mifflin & Co. London: Gay & Bird.

regards it as a modification of Romanesque—a discovery for which HEINRICH HEINE deserves some credit, for at a time when experts believed in the sylvan origin of Gothic arches he perceived from what he saw in St. Sernin, Toulouse, “die Entstehung des Gothischen Spitzbogens aus dem römischen Kreisbogen.” In the process of change from the older to the newer style the architects may have been charged with acting wrongly by too faithful an adherence to old characteristics. The history of the changes of style must always remain obscure, and it is not everybody who would agree with Mr. VAN BRUNT in believing that the late Gothic revival is to be ascribed to the operation of the moral sense, which demanded truth in art. As regards Queen Anne, it is said that “if the genius of NORMAN SHAW struck the first blow, the genius of THACKERAY gave the movement inspiration and character. Both revivals were patriotic, and would have been impossible if not associated with phases of English history; but neither conscience nor historic sentiment nor patriotism can make art.” Mr. VAN BRUNT owns that in America they have not developed old forms more happily than in England, but as architectural schools have been established he has hopes that they will be able to profit by the conventionalities of the Old World without being bound by them. What was done by HENRY HOBSON RICHARDSON in handling Romanesque should inspire confidence that similar attempts will hereafter be witnessed. If that expectation can be realised, English architects will be among the first to rejoice. But whatever may be accomplished, it is the conclusion of Mr. VAN BRUNT that a new style worthy of a place among the great historic styles is impossible.

The last essay treats of “Architecture and Poetry.” In it he renders justice to many Englishmen, and his praise of LONGFELLOW is fully merited. It cannot, however, be expected that poets could employ technical language with ease; indeed, one of ADDISON’S objections to MILTON is on account of the introduction of terms which would not be understood at tea-tables, and without technicalities a precise description of an architectural work is impossible. Mr. VAN BRUNT, with hesitation, presents some verses, entitled “The Church Door,” which may have been inspired by the porch of St. Trophème, at Arles, as an experiment in which the most expressive words are not rejected through fear of the critics. Here is a sample:—

The narrowing arch is deep and wide;
Niched in its jambs on either side,
Shaft beyond shaft in ordered stare
Stand on their solid stylobate,
Their leafy capitals upholding
Archivolt and fretted moulding;
Arch within arch with lessening leap,
From shaft to shaft concentric sweep,
Echoing inward o’er and o’er,
Inward to the vaulted door,
Every arch by subtle hand
Wrought with roll or bead or band,
Wrought with fillet or with fret,
Dentil, billet or rosette,
While between the sculptured rings
Angel choirs spread their wings,
And, soaring as the arches soar,
With viol and with voice adore.

For the happy masons said,
As the radial stones they laid,
Truly wedged, with every joint
Loyal to the central point,

And by touch of chisel taught
Utterance of human thought,—
“Let the choral arches ring
Joyfully a welcoming,
Every one in concord fair
Moulded and attuned to share
By the cunning of the mason
In a solemn diapason,
While the great arch over all,
Silent, bears the mighty wall;
Silent, while its arch-stones deep
Under the sheltering label sleep,
And the corbel-heads intone
Vespers with their lips of stone.”

Then with reverent hands they laid,
Deep in the archèd frame embayed,
Circled with immortal song,
Upon a lintel deep and strong,
A sculptured slab, to symbolise
Grace divine to human eyes.
Oaken doors they hung below,
On forged hinges turning slow,
The rigid iron branching wide
With foliate growth from side to side.

General readers may prefer the verses with a similar title which ARTHUR PENDENNIS turned out without much exertion, but in that case the masonry was of no more account than the frame of a picture, while in Mr. VAN BRUNT’S lines we can see the stonework and enjoy the mysterious carving.

The “Church Porch” is evidence of literary ability that Mr. VAN BRUNT should more often exercise. An architect who appears as an author and treats of art is expected to reveal new discoveries, and a man who has not a message which can be turned to account in everyday practice receives a cold sort of welcome. If that rule were applied generally, there would be few books produced. It

is often an advantage to be told of our imperfections, and a writer who considers the subject far away in Kansas City ought to have the credit of being impartial in his reproofs. Mr. VAN BRUNT is in a position to take a view of the art that is not enjoyed by all critics, and if from his coign of vantage the processes of the Greeks appear more interesting than those of his countrymen and their relatives, it is not unlikely that the critics of the next century, who are sure to have still more acquaintance with transforming processes, will hold a like opinion.

ORNAMENT IN BIRMINGHAM.*

THE efforts which are being made in Birmingham to undo the ill-effects of the teaching of the Science and Art Department—which were almost ruinous to the local industries—are watched with attention by rivals as well as friends in France and Germany as throughout Great Britain. On that account everything which exemplifies the new system of instruction is sure to receive more than the average amount of consideration. Mr. JACKSON’S “Lessons on Decorative Design” afforded a glimpse into what passes in the classrooms, and his “Theory and Practice of Design” is a revelation of the instruction given to the more advanced students. We must say the latter book is satisfactory on several accounts. In the first place, it is evidence that although Birmingham suffered much from the weakness of the Governmental system, and in consequence the City Council would have been excused if they insisted that every lesson must have a direct reference to the trades of the city, there are no narrow views taken of the province of industrial art. There is a part of the book which relates to “vessels of capacity, cups and vases,” and in other parts various kinds of metal-work come up for treatment; but all that is allowable. A designer who wished to work in Birmingham would find much that would be advantageous to him in the pages, but they would be also useful to him if he selected a different centre of industry for the exercise of his skill.

The importance ascribed to architecture would by itself be almost a sufficient corrective of any desire on the part of a student or a committee-man to restrict design within too narrow limits. The following passage on the relation of the art to ornament, if found in a book by an architect would probably be considered as presumptuous, but Birmingham manufacturers will do well to respect the theory it expresses:—

Architecture, rightly understood, is the art of æsthetic construction—not construction merely, but construction allied with beauty; not made beautiful by superadded decoration, but by beauty inherent in its construction. In architecture we recognise the fullest expression of the inventive and constructive faculties, together with a regard for beauty; and, as it is based upon order, fitness, proportion, stability and grace, elements drawn from such a source necessarily possess qualities so high as to command the attention of the ornamentist. The chief concern of decorative art is with beauty of line, form and colour, and it has less to do with constructive necessities than architecture. The freedom it enjoys from that restraint which attends æsthetic construction is, without some counteracting influence, a dangerous liberty, liable to run riot; but the employment of architectural elements offers a means for minimising such a tendency. In all the best periods of ornamental art the influence of architecture is distinctly seen. It is traceable in pottery, stained and painted-glass, ironwork, jewellery, the decoration of panels, pilaster shafts, &c. Architectural forms, pure and simple, are often incorporated in decorative designs, but are oftener modified by the imagination, so as to bring them into harmony with other and freer details with which they become associated. Hence while some forms are distinctly architectural, others are but suggestive. Now, in adapting architectural forms in a design it is not essential that the rigidity necessary in pure architecture should always be maintained, because the same structural conditions have not to be dealt with. In the case of architecture, actual physical weight has to be provided for, in decoration the appearances of weight only; and so long as the eye is satisfied with the semblance of stability, freedom of treatment can be indulged in. The reason given above for modifying the severe forms of architecture, namely, that they may be brought into harmonious relation with more ornate elements, justifies such treatment; and the history of architecture itself furnishes instances in which forms, taken from a severe style to be used in a richer one, underwent considerable change to fit them for their new position.

Respect for architecture will help to check extravagance in a designer, and also will enable him to overcome a petty manner of treating forms. Mr. JACKSON takes care, how-

* *Theory and Practice of Design: an Advanced Text-book on Decorative Art.* By Frank G. Jackson. London: Chapman & Hall, Limited.

ever, to point out how far the architectesque character of ornament is to prevail. By contrasting the treatment of wall-surfaces and of textiles for hanging in rooms the difference in the application of ornament according to purpose appears obvious. For neither class of work is the adoption of naturalistic forms recommended. Although imitation of Japanese designs is common enough in Birmingham (and indeed some people imagine that the imitations are so close they can pass as Eastern products), in the Municipal School the style does not obtain much favour. When Mr. JACKSON says that "Modern decorative art has been made so to depend upon natural objects for its material, it is in constant peril of losing its essential characteristics," and that "the principle of irregularity, the chief characteristic of the picturesque, has been unduly emphasised, to the almost complete neglect of the principle of order, which is the basis of decorative art inherited from construction," we imagine that many members of the Council would not agree with him. The unavoidable reaction against South Kensington has compelled people in England to look with favour on a naturalistic treatment more or less corresponding with the style of the Japanese, and it is found that by attention to framing lines or borders the irregularities can be made to appear less disorderly than might at first be supposed. Mr. JACKSON is, however, consistent in what he says. As we have seen, he prefers an architectonic basis for ornament, and it is not always easy to reconcile Japanese realistic or naturalistic treatment with that sort of regulatory influence. As the book is dedicated to the memory of the late F. W. MOODY, it corresponds with what he taught, or, in other words, upholds the supremacy of the Italians as ornamentists. Those who prefer a more flexible style, for surface-decoration especially, will, however, admit that, as a corrective of what used to be known as "Brummagem art," there can be nothing found that is more effectual than a study of examples of the best period of Italian Renaissance. Another advantage of the Italian style is the more general applicability, for it can be employed in sculptural decoration, especially where the figure has to be an element, a property that must count for much wherever metal-work of a high class is produced.

In at least one way, however, Mr. JACKSON draws a lesson from the practice of the Japanese, and that is in the general use of the brush for outlines as well as washes. When treating of methods of expression he says:—

While our national scheme gives, perhaps, too much encouragement to line-drawing, it gives no stimulus to space or mass-drawing by the brush. This omission is to be regretted, as practice of this kind bears so directly on many artistic industries. The use of the brush is capable of developing powers of drawing beyond all other means, and while it will assist the student to more rapidly appreciate the value of quantities by directing his attention to spacing and to the solidity of the forms used, the freedom of hand acquired by the employment of the brush will affect his line-work and raise its quality. Whatever may be thought of the Japanese as decorative designers, there can be but one opinion as to their merits as draughtsmen, and their skill in drawing is largely due to their being accustomed from their youth upwards to the use of the brush as a writing and drawing implement. The power seen in their line-drawing, which for vitality is much superior to the generality of European work of a similar nature, has been developed from the restricted use of a hard point. In his Oxford lecture on "Line" Mr. Ruskin, after speaking of the practice of the old masters, says, "The fact is that while we have always learned, or tried to learn, to paint by drawing, the ancients learned to draw by painting. The brush was put into their hands when they were children, and they were forced to draw with that until, if they used the pen or crayon, they used them with the lightness of brush or the decision of a graver." By substituting the brush for the pencil-point we have a direct means for expressing mass and space as well as line. Linear ornamental elements translated by the brush become enriched and gain special characteristics by the process; lines so changed and forms which are the natural outcome of the implement not only largely increase our range of ornamental material, but also augment our methods of expression.

The numerous illustrations prove that Mr. JACKSON is as expert with the brush as with the pen, and he is able to speak with experience of the different implements used in drawing. But he does not confine himself in his teaching to representations on the flat for surface decoration; his remarks on ornament in relief and in the round exhibit no less competence, and it is evident he is well qualified to supply all the information concerning art which Birmingham is likely to require—an amount which is not easily attained or systematised. From the practical necessities which inspired the lessons, Mr. JACKSON's book can be recommended for use wherever art is combined with industry.

EGYPTIAN DECORATIVE ART.

IN his second lecture on "Egyptian Art and Decoration," delivered before the Royal Institution, Dr. W. Flinders Petrie said that it might be supposed that the imitation of natural forms would be the earliest system of decoration; it was not so. On the contrary, the geometrical forms of wave lines and chequers copied from weaving and the varieties of the spiral were the first ornaments of importance, feathers and flowers coming at a later period. The feather in its different forms is shown unmistakably on the coffins of the Antefs in the eleventh dynasty before coming into common use. The royal mummy is seen swathed in protecting wings, representing those of Isis behind him and of the vulture of Mut on the head. On the kings of the eighteenth and twentieth dynasties we often find a wide belt covering the whole stomach with the scale pattern, and this in non-warlike scenes, where no defensive scale armour would naturally be shown. Such a belt would be admirable for lightness and warmth, and it is absent in fighting representations. This feather pattern is also often used on the sides of thrones from the eighteenth dynasty to the latest times. Later it is seen on very incongruous objects. In the eighteenth dynasty it is used around columns (Tel-el-Amarna) and on metalwork, where it must be a purely artificial marking. Under Seti I. it became elaborated with markings both on the dress of a god and on a throne cover. Under Rameses II. it was degraded into an unintelligible pattern, as on the dress of the god Amen; and later at Philæ on columns, in an inverted and very corrupt form. The use of flowers for ornament is so natural that they occur in earliest times, although only a few were used—the lotus first, and then the papyrus, the daisy and the convolvulus, the vine and palm; these almost complete the material of vegetable design. The rosette may be called a generic flower ornament, so conventionally treated as hardly to receive a name. In the eighteenth dynasty, e.g. it is a daisy, more seldom it has the pointed petals of the lotus, and it fluctuates so between the geometrical and the natural as to defy detail. One cause of this is the effect of leatherwork. The coloured leather funeral tent of Isimkhat found at Deir-el-Bahari opens our eyes to a great deal. There is an elaborate design, descending to long inscriptions of small hieroglyphs, all worked by cutting and stitching leather. The earliest rosettes we know—those on the headbands of Nefert—are plain discs of colour divided into segments by white lines across them. The discs are leather secured by radiating threads, and the same appear in the eighteenth dynasty more varied by concentric circles of colours. Another stitch ornament is seen on the stuffs used for covering thrones—star and cross patterns, and in the spaces discs of colour with white pieces sewn on round the edge. On a dress of Rameses II. are little six-pointed stars. Some rosettes are independent of the influence of leatherwork. The great series of these is in the moulded glazed ware of Tel-el-Amarna, where we have several dozen varieties. On metal vases the rosette is very general, sometimes a separate ornament of beaten work rivetted on, like the silver ox-head at Mycenæ, or embossed *repoussé* on the metal. Rosettes are found carved in wood or ivory, and along borders with the lotus or other subject. One pattern is the disc surrounded by spots, much used on early Greek and also found in Ægean pottery, although rarely in Egyptian design. It is seen on the negroes' scarves and on the dress of Amen; and it appears to be distinctly a foreign ornament. Dr. Petrie said he now came to the lotus, so widely spread that some have thought it the source of all ornament; and there is certainly plenty in it to tax the imagination and reason. The debated question of lotus and papyrus appears to be resolved by the flowers with long sepals and petals being the lotus, and the bell-flower with short sepals being the papyrus. In ornament, doubtless, they were sometimes confused and the details mixed, and it is of no use trying to separate them. The oldest use of the lotus was in groups of two flowers tied together by the stalks, such as are found on the prehistoric pottery at Koptos and on the earliest tombs. The plain flower was used very early; it is seen on the head-band of Nefert, in the fourth dynasty. In the tomb of Imery, of the fifth dynasty, it is seen as a capital in wood. The variety of lotus capital is very great; the bud capital and the opened flower are both shown in the eighteenth dynasty, and many complicated and impossible forms in the decadent age of the Ramesides. The lotus was much used in repetition as a border-pattern, but not before the eighteenth dynasty. The flower and bud were developed in mechanical fashion, but the isolated *antheion* (which is so much like this) has probably a different origin. The whole plant was also a favourite subject as a group. It is seen as a foreign ornament on the dress of a Syrian slain by Rameses II. at Abu Simbul, but perhaps the tufted papyrus is intended here. The Ptolemaic walls are ruled over with stiff friezes of lotus and bud. The flower now becomes a monstrosity, only decorative and not natural. First there is the *fleur de lys* type, with curled-over sides and a middle projection. The Egyptian drew the interior or top view of an object above the side view, and

partly in top view above that. A dish would be drawn in side view and a top view of its contents placed over it, and the bunch of flowers that lay on it placed over the top view. Thus we see that the projection in the midst of the lotus flower is the third sepal at the back of the flower, the fourth in front being so foreshortened as to disappear altogether. A more complex form comes next and has not been yet explained. In the eighteenth dynasty a strange form is seen with reversed curling arms above the calyx, from which we get a very mechanical form greatly developed in Assyrian and Greek types of the pattern. If it can be proved that the Assyrian tree pattern is earlier than this development, we could grant what seems a likely influence on this development of the pattern. In Assyria this became a staple design, in which the top was greatly increased at the expense of the lotus sepals below; but still the four sepals, two front and two back, are shown. In the Greek designs the same elements remain, however barbarous they may seem in comparison. A late development of the lotus in Ptolemaic Egypt was with a central spike through the fan of petals. On very compound lotus patterns there is a pendant from each seed of the side petals; but this does not appear till the eighteenth dynasty on the monuments; it is sometimes single and sometimes double. But here, as in the spirals, the scarab type is earlier than the architectural. It is a mere monstrosity in the latter view; while in a scarab of green jasper, which from the style and material seems certainly of the eighteenth and probably of the twelfth dynasty, there is an already conventional lotus group with the four sepals and inner petals developed into a sort of tree pattern. The papyrus was often confounded with the lotus in decoration by the ancients as well as by moderns. It is well shown in the group of boat-builders to whom bundles of papyrus are being brought in the fourth dynasty tomb of Shepserkan. The lotus and papyrus are shown alternately on the frieze of Amenhotep III. The two plants are also contrasted on the two granite pillars of Tahutmes III. at Karnak. Much use was made of the papyrus in the floral work at Tel-el-Amarna. On the painted pavement groups of papyrus with large and fluffy heads of seed vessels were figured, and on the coloured tiles the landscape view of the papyrus plant is frequent. The palm, though the most important tree of the country, had little effect on architecture, there not being a single example of columns copied from a palm-stem. In later times the branches and fruit were both sculptured. The vine is one of the oldest cultivated plants in Egypt, and all the designs from it are based on the idea of its climbing and trailing over the houses. It appears mainly in the floral work of the eighteenth dynasty. Ceilings painted golden yellow often have vine-leaves and bunches of grapes. The convolvulus has not been much acknowledged as an Egyptian ornament, but it often occurs during the eighteenth and nineteenth dynasties. Dr. Petrie went on to speak of the artificial combinations of flowers, and concluded by a reference to the men and animals shown in decoration. The men were often represented with captives kneeling at their feet. Of the animals the ibex does not occur till the eighteenth dynasty, but is often found on finger-rings of Akenaten's time. We have also the hawk, the vulture and the duck. The lecturer concluded by saying that our theory of an artistic effect which must never involve falsity, but which may have little or nothing to do with nature, was entirely outside the Egyptian's æsthetic.

THE LATE WALTER F. K. LYON.

THE late Walter Fitzgerald Knox Lyon was a son of Lieutenant-Colonel Lyon, 2nd Life Guards, and was born at Pau, France, in 1845, his godfather being the last Sir Walter Scott, son of the poet and novelist.

Having strong artistic inclinations and a great admiration for ancient buildings and antiquarian research, he determined to follow the profession of architecture, and entered as a pupil the office of Messrs. Peddie & Kinnear, of Edinburgh. Here he spent several years, during which he visited, studied, sketched and measured many ancient castles and buildings in different parts of Scotland, thereby gaining an intimate and exceptional knowledge of Scotch Baronial architecture and became an expert master of the style, as is shown by numerous executed works.

Commencing practice in London in 1869, he was successfully engaged in the erection of large country houses both in England and Scotland, notable among them being Pendley Manor House, near Tring, Herts; Cowhill Tower, Dumfriesshire; Fyndynate, Perthshire; and Kirkwood, near Lockerbie, together with a number of other works in which his architectural abilities were manifestly displayed.

A fine drawing of his, showing a suggested restoration of the south front of Edinburgh Castle, was some years back hung in the exhibition of the Royal Scottish Academy, and attracted much attention, being afterwards published in the professional journals.

He made occasional contributions to the papers of the Society of Antiquaries of Scotland, the last, in 1893, being on "The Structural Remains of the Priory of Pittenweem, with Plans and Descriptions of the Caves Below." He also took great interest in heraldry and genealogy, and was a clever etcher.

He was a Fellow of the Royal Institute of British Architects for some years, a member of the Conservative Club in St. James's Street and several golf clubs, where his kindly, genial nature and keen sense of humour made him a general favourite with a large circle of friends, and to those among them who had the pleasure of his intimate friendship his untimely death will prove a great loss.

He died on Monday, May 28, at his residence, 7 Redcliffe Square, S.W., after an illness of only six days, caused by chill, resulting in pleurisy and pneumonia.

ARCHITECTURAL ASSOCIATION DINNER.

THE annual dinner of the Association, which was held at the Holboin Restaurant on Thursday, the 31st ult., proved most successful as a social reunion of members and friends, when about seventy gentlemen sat down under the presidency of Mr. E. W. Mountford. There were present, amongst others, Mr. F. C. Penrose, Mr. Walter Crane, Mr. A. B. Pite, Mr. A. Cates, Mr. H. W. Barnes, Mr. F. T. W. Goldsmith, Mr. Paul Waterhouse, Mr. C. R. Ashbee, M.A., Mr. W. D. Caröe, M.A., &c. After the loyal toasts the President proposed "The Royal Institute of British Architects," and expressed the thanks of the Architectural Association for the aid given them in carrying out their examinations.

Mr. A. Cates, in responding, spoke of the value of the alliance of the Societies formed to promote the study of architecture, as by doing so students in the provinces were put on the same level as those who studied in London. He hoped that in the future they would establish a progressive examination, to be followed by an honours examination.

Mr. E. T. Hall proposed "Success to the Architectural Association." They had omitted that evening from their toasts the Army, Navy and other forces, and substituted the more peaceful and more important branch of the art of construction. That art was associated with the peaceful progress of society. They had a corporate existence, which enabled one to help another. The Association represented the youth, energy and zeal of the members, and it had a promising future before it.

The President, in responding, said the Association had done a great deal of good within the last quarter of a century of its existence. They numbered members in all parts of the world, and they had been copied in many distant towns in their corporate existence. Their number of members had risen to 1,200, and they were all paying members. The ranks of the Royal Institute of British Architects had been largely recruited from the Association, and he hoped in the future that the Institute would be made up almost entirely of A.A. men.

TESSERÆ.

Recipes in Art.

SOME ingenious artists have endeavoured to account mechanically for the superior perfections of the celebrated Greek statues, by the characteristic nature of lines and angles, uniformity and variety; and they have reasoned after the following curious manner:—That perfection consists in the variegated composition of straight, convex and concave lines and angles; that the straight gives simplicity, the convex greatness, and the concave elegance and lightness; that the waving line gives beauty, and the serpentine or twisted grace, that the Apollo Belvedere is composed entirely of very gentle convex lines, of very small obtuse angles, and of planes or level parts; but the soft convex predominates. It being necessary that the character of this divine figure should express force, grandeur and delicacy, its author has demonstrated the first by the convex contours, the second by their uniformity, and the third by the waving lines. The obtuse angles and light inflections form the waving line, and by their union is shown sufficient force and dignity. In the Laocöon the convex lines predominate, and the forms are angular, as well as where they indent or fall in as where they swell out, by which means the agitation of the expression is manifested, because in this way the nerves and tendons of the figure, which are much strained, are rendered more visible, the straight lines being opposed to the convex and concave, by which is shown that the figure is agitated. The sculptor of the Hercules has found out a taste altogether different; he has made the forms of the muscles convex and round to show that they were real flesh, but the line of indenting or entry is straight, to signify that

those parts were nervous and meagre, and by this is expressed the character of force and strength. In the Gladiator there is a mixture of the forms of the Hercules and the Laocoon, because the muscles in action are agitated and those in repose are short and round like those of the Hercules. In the torso of the Belvedere, a work merely ideal, all the beauties of the other statues are united because it has a variety so perfect that it is almost imperceptible; its plane or flat parts are not to be discerned but by comparing them with the round, and these with the other. The angles are less than the flat or the round, and could not be distinguished were it not for the little beds of which they are composed. Perhaps these rules may be of some use in the arbitrary conjunctions of composition, but they appear to be very inconclusive and much out of their place when thus applied to prescribed forms, which can result solely from their propriety and fitness to the character, and from actions corresponding with the sentiment and occasion. Besides their utter inapplicability, these multiplied little rules seem likely to generate manner, to substitute the artificial in the place of the natural, and to distract or occupy too much of that attention which ought to be bestowed on matters of more importance; and still further, they appear altogether unnecessary, for when these higher matters of the character and action are properly attended to they produce all that can be sought after by any rules without the incumbrance of their application; for instance, the character of a beautiful female, or of an athletic male body, and all the circumstances of its action, as sitting or dancing, being judiciously determined, the form of all the parts, their relative swellings, cavities, angles or planes must follow necessarily, and in their precise and exact degree; their conformity with the character and action is the only arbiter that can be admitted, and nothing is left to the choice of the artist. The contour of a stretched-out arm must depend upon the character of the arm, whether it be that of an Apollo or a Hercules, and upon the business about which it is employed, whether pushing or pulling or merely stretched out—for in all these cases the contour will be essentially different; the same must inevitably hold of all other characters and actions.

Grouping in Painting.

That the whole of the composition may with ease and pleasure to the spectator be comprehended in one view, it is necessary that its several parts (however variegated in their details) be so artfully linked together as to form one general appearance, consisting of a few large parts, masses or groups of objects. But whether the several parts of this concatenated mass be on the same or on different plans, it is equally necessary that although they be so united as to form an easy concurrence into one general view, yet they are not to be crowded or huddled together; their separation and distinctness from each other are objects of no less consequence than their union. The several portions or masses of this general appearance should be diversified either in their magnitude or figure, or some in both. Of these masses one ought to be principal, and all the others dependent and subordinate; and as the attention will therefore necessarily centre on this principal mass, it follows, of course, that whatever is intended to be of the greatest interest in the composition will appear more properly, and to the greatest advantage, as forming the whole or a part of this principal mass. As to the general shape or form of the principal and its subordinate groups, taken together, whether it incline to the pyramidal, either erect, inverted, laterally, or horizontally placed, or to any other figure, this is a matter entirely arbitrary; the only attention employed on this occasion is to guard against the too great regularity, sameness and equality of parallel, rectilinear, rectangular, or even too circular appearances. In a word, whatever be the general figure of these concatenated groups, it should neither be too regular nor too complicated, and it is rather to be loosely or obscurely indicated or hinted than clearly and specifically defined. The several parts of this concatenated mass should preserve some kind of equilibrium and symmetrical order amongst themselves, that nothing may appear wanting to its completion as a whole; and in the same manner that the several masses or groups are attached to each other, that nothing may appear entirely insulated or detached in all its parts, the several figures and other component parts of a group must in some part of its contour or drapery be, as it were, let into or interwoven with the next object.

Chiaroscuro in Architecture.

When the examples of beautiful and majestic arrangements of relative magnitudes and forms in architecture were once executed, they might be easily copied and multiplied by the rule and compass of mere mechanics; but the history of architecture and architects, both in Greece and Italy, affords one continued chain of proof that all the great inventors, restorers and improvers of architecture were, as might naturally have been expected, painters or sculptors. The first architect mentioned by Vasari is Buono, a sculptor and architect of the twelfth century. The Campanile at Pisa was com-

menced by one Guglielmo, and Bonanno a sculptor; the next architect mentioned by Vasari is Marchionne, a sculptor of Arezzo; the next are Jacopo a German, Lapo, and his pupil, the celebrated Arnolfo di Lapo, who commenced the cathedral of Florence. These were followed by Fuccio, Niccola and Giovanni Pisano, Lino of Siena, Margaritone of Arezzo, and Giotto, all sculptors, and the two last painters also, as well as architects. Agostino and Agnolo of Siena, Andrea Pisano, Orcagna, Brunelleschi, Michelozzi and Julian da Maiano were likewise all celebrated sculptors as well as architects. The history of architecture reveals the utility and importance of chiaroscuro, and the absolute necessity of its being a leading consideration in the fabrication of all objects presented to the sight. Attending only to the actual fact, without entering into the reasons or the necessities which might have occasioned it, we must confess that many of our churches and public buildings of the last age have the same bad appearance as Chinese pictures, where there is no light and shade to give brilliancy, repose and majesty of effect; mere walls inlaid with pilasters or half-columns, unconnected perforations for windows and doors, and nothing to relieve the sight from a dull disgusting monotony of light without shade. This hateful, insipid uniformity cannot be removed by diversifying forms on the same surface, like mere outlines on paper. They want the force of chiaroscuro to give them that rilievo which the sight necessarily demands, and without which they are not forms but sketches and indications of form. In the sound examples of art, when pilasters or half-columns have been employed, and consequently the entablature deprived of its accustomed projection, they were either accompanied with arched ways, which produced the necessary quantity of shadow, as in the Theatre of Marcellus, the Colosseum and many others, or their continuity was interrupted by other more retired parts or objects, to which they serve as illuminated portions or masses. Where prominent parts could not be obtained for the projection of adequate shade, voids have been introduced, as they answer the same end, but in a less degree; they serve as a shade when the object is in shadow. In all cases where this uniformity of surface and equally diffused light is supportable, shadow, or what is equivalent to it, will be somewhere found to have occasioned it, either by gloomy trees or other dark objects connected with the view. Canaletto would make good pictures of our worst churches by employing his skill in the relative picturesque accompaniments.

Defects of the Pantheon, Rome.

The edifice has faults, and great ones, circumstances which are certainly injurious to its perfection and to the agreeable impression on the mind of the spectator. The columns are rather too small in proportion to the size of the building; the entablature is disagreeably interrupted by two arches, and these arches on a curved surface are necessarily supine, that is, the crown falls back behind the springing, and this gives them an awkward appearance. The space above the columns, which is a modern alteration so late as the last century, is altogether bad. Till then an attic existed adorned with pilasters, formed not in relief, but by different coloured marbles. This was attributed to Septimius Severus, and not generally approved, but it seems to have been well calculated to preserve the general impression of the building, and to have contributed to give rather an increased value to the order below. It would probably be better (internally) to make the upright part of a building of this sort somewhat greater than the semidiameter of the circle on the plan; at least in the present case, the dome itself seems to come rather too near the eye and to occupy too much of the view, especially in the condition it now is, presenting an overwhelming extent of whitewash. It is supposed that this was also covered with bronze panels, but the time of their removal seems uncertain. These panels would probably have followed the disposition of those now existing in the brickwork and stucco; that is, they must have been in square coffers, and in such a case the most obvious way of cutting the recesses is to make them at right angles to the surface of each part, or, to speak more mathematically, at right angles to the tangents of the surface, and consequently all tending to the centre of the curve; here they are cut in almost vertically, or if they do tend to a common centre, it is to one below the eye of the spectator standing in the centre of the room. Some people affect to understand the reason of this; but the result is distortion, and if really intended to produce any pleasing optical deception, it must be attributed to great want of judgment, as it could only succeed from one spot, and must look ill everywhere else; whereas, without any such contrivance, the spectator himself would at once make allowance for situation, and the mind would be satisfied; for in architecture, and probably in all the fine arts, it is often rather what we understand than what we see that produces the sensation of pleasure. In unusual situations some allowance may be permitted, but it should always be so limited that a moderately practised eye will not perceive it. If instead of being drawn to the centre of the hemisphere,

which is the most obvious method of forming them, the lines of the recesses had been directed to a point 18 or 20 feet below it, it is possible that they would have appeared to tend more correctly to that centre than if they had been really drawn to it; but as they are, everybody at once perceives that they are not so drawn. These panels are omitted for a circle of considerable width round the opening in the centre, but we cannot doubt that this part also had originally its share of decoration. The little altars are all bad in design and worse in execution, but not all equally so; the best of them are usually attributed to Septimius Severus.

Reverence for Antiquity.

The reverence for antiquity is to be no blind passion, as some suppose it to be. Is it not a respect for the productions of thinking reasoning minds—of great men who, having certain requirements to fulfil, pursued a train of laborious thought, studied nature herself for sources of inspiration, and felt that they had to realise the wants of well-informed and highly-gifted men? It was no wild caprice or loose imagining which planned the Parthenon and designed the Colosseum or Pantheon. It was a grave people who conceived and executed the overwhelming and awful edifices within the sacred precinct of Karnak and Luxor. Were not these independent minds? Were these servile imitators? But did they create these at once from their own resources or, as the phrase now is, "from common sense," a term identical with presumptuous ignorance? These great men studied the productions of previous periods, well weighed all their own wants, and hence resulted works that have commanded the respect of every succeeding age. In fact, without a knowledge of the Classic monuments of antiquity no one can have other than an imperfect, faint image of architecture. Egypt and Greece had an existence peculiar to themselves. Independently of intrinsic beauty, their art had the great taste of perfection, unity, simplicity, appropriateness. In studying the fine productions of the Greek and Egyptian minds we do not acquire merely the proportions of a cap, a cornice or a column, but we intuitively impress our minds with noble and sublime principles, and by the contemplation of simple and grand edifices receive impressions which are imperishable.

Architect's Sketches.

It is not enough that the edifices of Greece and Rome have been correctly published by others. If the student wishes to know a building thoroughly he must measure it himself. And the greater the number he measures, the vaster will be his store of useful authorities and types to assist his invention and to guide his taste. But to increase this store to a greater degree, and thus gain an inexhaustible fund to which he may refer on any occasion, it is desirable that the architect, at whatever stage it may be of his practice, should carry constantly with him a sketch-book. He should make a slight drawing of anything which may strike him as remarkable and worth remembering. His motto should be, "Nulla dies sine linea." The very act of sketching an object will impress it upon his memory. But in addition to that result he will have a more exact notion of it, and if he should forget it he has it upon record for future reference, and certainly he will thus acquire the habit of more exact observation. The sketches should be subsequently arranged systematically in a larger blank book with a proper classification of subjects, and by this means he may ultimately possess a most interesting series of precedents, descriptions and authorities, whether in art or in the sciences connected with architecture. He will thus have a collection which will readily furnish ideas, that will appear to rise spontaneously, but which in fact will only be the fruit of these seeds which he will as a student have so laboriously collected in his earlier years.

Study of Buildings.

Many students in architecture seem to employ themselves wholly in measuring different buildings, ancient or modern, and imagine that while so doing their time is necessarily well employed. To a certain degree this is a desirable occupation, and it fills the portfolio and makes a great display of industry; yet it is possible to be more industrious, and more usefully so and have less to show. No artist has the notion of ever following any of these buildings minutely in his own productions. Who would ever think of copying the Pantheon in its precise dimensions and in its details, or what employer, either public or private, could ever require it? and if it were done, have we not engravings which would be sufficiently exact? In a length of 144 feet it is impossible to consider an inch or two more or less as of any importance. Nor is the wish to return with a great number of laborious drawings a reasonable motive. After the first month or two they are neglected, and as they have little beauty in themselves and are not wanted for imitation, they sleep perhaps for ever in the portfolio. The real motive for measuring any building is to understand it better. The student's attention is forced in succession on each individual

part; he gets it, as it were, by heart, and what he possesses on paper is of little value compared with that which he fixes in his mind, and indeed the principal merit of the first is that it recalls the latter, which among so many objects might be forgotten. What the student has to do, then, is to see every ancient building and every modern building of consequence; to remark whatever pleases him and to note it on paper, either in writing or by sketches, or rather by both; to consider what are the circumstances to which the effect which he admires is owing, whether in the general distribution of the masses, in the disposition of the orders or in the minuter details, and to take such dimensions and make such drawings as would enable him upon occasion to produce a similar effect, and this mental process is to be applied not merely to the beauty, but also to the solidity, convenience and economy of the edifice. This will form his principal employment, but besides this he will find it advantageous to notice whatever either in plan or in ornament gives character to one edifice or to one style of architecture; to copy in detail a few of the most beautiful ornaments, whether of friezes or of capitals, or of any other part, and to go completely through in plans, sections, &c., one or two ancient and one or two modern buildings till he makes himself quite master of the feeling of the artist.

Etching.

M. Lalaune says, "L'eau forte doit être vierge comme une improvisation." It is exactly this freshness, this "virginity," that is wanting in common etchings. No ordinary artist can work in this brilliant and rapid way any more than a common speaker can make, without hesitation, a speech perfect enough to bear cool criticism after it is reported. Then, again, this faculty of doing right at once is a special gift; we know good artists who are naturally destitute of it, men who have to seek painfully every separate quality in their pictures, and who, nevertheless, by dint of long seeking and correcting paint valuable works in the end. Still these men, however great their information and even power as artists, are not so constituted as to succeed in etching, because their information is not fully available on the spur of the moment, nor their power combined with that decision and agility which, in etching, are necessary to its effectual display.

S. Francesco della Vigna, Venice.

The plan of the church of San Francesco della Vigna was prepared by Sansovino. A representation of the façade is given on a medal struck in 1534, but the Patriarch of Aquileia, at whose expense it was to be built, not thinking it sufficiently magnificent, employed Palladio, in 1562, to make the design which was afterwards executed. It appears that Sansovino's plan (already begun) was, in 1533, submitted to Francesco Georgi, a brother of the convent, who proposed to rectify the proportions according to what he called Platonic principles. "I would," said he, "that the width should be of nine paces, nine being the square of three, a prime and a divine number; and that it should have a triple proportion to the length, which should be of twenty-seven paces, forming a diapason and a diapente;" and then he goes on to say that this relation and harmony was appointed by God himself, who thus fashioned the world, and directed Moses to observe it in the tabernacle, which was to be made according to the model shown to him on the mountain; which model, according to the opinion of the wise, was the world itself. The author proceeds through all the parts of the church in the same style. That men should have such dreams, that they should write them, may not be a wonder, but that they should think such dreaming to be reason, that they should publish them as such, and that the world should ever have received them as such, does seem to be a little marvellous. With all these harmonious proportions, however, or without them the inside is not beautiful; the outside does not at all correspond with it, and nobody need doubt that the building was the work of two architects. Palladio's churches have all one general disposition in front—a pediment in the centre supported on half columns and a sloping roof on each side, resting on a smaller order, whose horizontal cornice is continued more or less perfectly in the intervals between the larger columns. The effect is always in some degree as if a great pediment over the smaller order had been cut away for the purpose of introducing the larger; and on this account it would be better entirely to omit all trace of the smaller order in the intervals of the larger. However, though not absolutely perfect these buildings are very graceful, and hitherto no better mode seems to have been adopted for accommodating Roman architecture to the usual disposition of a Christian church. In the present example the lower cornice is only continued in two or three flat members in the inter-columns, and there is a small projection in the wings on which the cornice returns, so that these flat mouldings alone are interrupted by the columns. Both orders are on a high continued pedestal which breaks round the principal columns and is cut through to admit the door. Over the door is a large semicircular window.

NOTES AND COMMENTS.

ALL over the world Government departments appear to be inspired by one principle, which is that the ease and security of the officials must be paramount to public needs. The United States at the present time are affording an apt illustration of the application of the principle. The public buildings throughout the country are not worthy of a people whose progress is without precedent. Only one remedy can be discovered, which is to restrain the inventive power of the Governmental department of architecture. It was supposed when an Act was passed authorising the employment of unofficial architects that the improvement was about to take place. But Mr. CARLISLE, the Minister who fills the office of Secretary to the Treasury, grew alarmed at the consequences of the power that was entrusted to his discretion. Instead of arranging for a competition for public buildings in Buffalo, he followed the old jog-trot course which has led to so many failures. There was an outcry, and officialdom declared that the language of the aggrieved architects was so unlike the prescribed forms for use when addressing important people that, without loss of dignity, there could be no reply. It was an ingenious way of evading a controversy where law and logic were on one side. Mr. CARLISLE now frankly explains that if he has allowed the Act to remain inoperative it is out of respect for official rights. He announces that "the required change in the method of preparing the plans, drawings and specifications would necessitate a reorganisation of the office of the Supervising Architect, a reduction in its force, the rearrangement of the different divisions and the work to be performed therein." We suppose there never was a new law created which did not require some sort of shuffling of people, but, as political economists say, men are free to transfer themselves from one occupation to another. The American Legislature must have contemplated changes when the TARSNEY Bill became law, but an improvement in buildings was worth a little sacrifice. Owing to the terror of Mr. Secretary CARLISLE the people must be content with whatever ugliness the official imagination can devise, and economy must be ignored because the obtaining of designs from competent hands would necessitate a reduction of force. The Secretary proposes an amendment of the Act which would allow of the appointment of commissions, bargaining with architects, valuing of the services rendered, and, above all, would impart authority to the Secretary to preserve the old monopoly of the Supervising Architect's office, all of which means that it has been decided to leave no effort untried to prevent architects from having any share in the designing of the public buildings of the States.

A DECISION has been given in the Edinburgh Dean of Guild Court which must affect building operations in that city. There, as elsewhere, people desire to have higher houses than were formerly erected. Accordingly, when application was lately made for approval of plans of five-storey dwelling-houses at Montpelier, the owners of property in the neighbourhood, whose houses would appear of diminished importance, as they were of inferior height, lodged protests. The ground of objection was that the proposed houses would infringe the provisions of the Edinburgh Municipal and Police Act, 1891, and the Edinburgh Improvement Act, 1893, since their height exceeded by 8 feet 3 inches the limit permitted by those Acts. The applicant contended that the provisions of the statutes regulating the height of buildings referred to either (1) existing houses which were to be increased in height, or (2) to buildings in entirely new streets to be formed and laid out after the passing of the Act. He also pleaded that he was neither increasing the height of old houses nor building houses in new streets. It was maintained that the terms "height of houses or buildings" did not bear the construction put upon them by the objectors, as the height was to be measured to the ceiling of the highest room. After giving sufficient consideration to the points raised, the Dean of Guild Court decided that the plans, if carried out, would be a contravention of the Acts. It was also laid down that the provisions applied to new as well as to existing houses, and that the words "height of houses or buildings" meant the

height measured, not to the ceiling of the highest room, but to the ridge of the roof. The applicant thereupon agreed to reduce the houses to four storeys, and in the amended form the plans were approved.

THE sale of 3,446 prints during last year by the Art for Schools Association is a creditable achievement. It is further evidence of the necessity to make classrooms pleasant to the eyes of children. Nor can it be said that the introduction of pictures causes a neglect of studies. At the annual meeting of the Association which was held last week a letter was read from Mr. ACLAND, M.P., in which he said:—"To brighten the walls of our schools and to add to the happiness of the children by showing them beautiful and artistic objects is a most valuable service rendered by you. I much wish that a series of designs on a large scale, not less than 6 feet in depth, for the upper part of the walls of schoolrooms could be brought out. You are aware that I have promised to assist the visits of children, under proper conditions, to art galleries and museums." In his interview with a deputation a few days before Mr. ACLAND spoke as if he referred to painted friezes. From his later utterance it would appear as if he thought printed friezes would serve. It is needless to say there is a great difference between the two classes of work. To produce a printed frieze 6 feet deep is not a speculation that many publishers would care to undertake. The nearest approach to it is a coloured "theatrical poster," which is made up of several sheets. The posters are not made to endure, and a large frieze on paper would soon look shabby, although it might be protected by a coating of varnish. Prints that can be covered with glass form the best decoration for a schoolroom, and they are the cheapest. In the numerous Board and other schools where plates from *The Architect* are employed, there has been no more objection to the scale than to the subjects. If pictorial works on a large scale are to be employed, it would be wiser to imitate the Parisian plan in the few cases where they were tried, that is, not to place the paintings high up on walls, but on a level where children can scrutinise them and make drawings from them.

THE case COWELL v. ELKINGTON, which was tried before Mr. Justice GRANTHAM on Monday, will be considered to support those critics who say that fine bronze work, especially of the medallion class, cannot be satisfactorily produced in this country. That there is little practice in medallions is true, and without practice perfection is not to be reached in metal-working. At the same time, it is undeniable that the defendant firm have produced excellent work, while failures are not unknown among the chief bronzists and electrotypists of Paris and Berlin. The failure which gave rise to the lawsuit would appear to be due in some measure to want of experience. The plaintiff, Mr. COWELL, a sculptor, modelled a head of TENNYSON as a medallion. He was eager to have copies produced at Christmas time, as he expected to sell them at from three to five guineas apiece. He agreed with the defendants to supply electrotypes at half a guinea each. Mr. COWELL furnished a medallion in wax, which is generally supposed to produce the sharpest reproductions. Only six copies were taken from it, and as they were not considered satisfactory Mr. COWELL declined to allow their sale. The original was also damaged by distortion. The action was taken to recover damages for injury to the wax medallion and for loss caused by the delay in carrying out the agreement, for the remainder had to be electrotyped from a plaster medallion. The defendants' case was that the wax medallion was too thin, as it was not backed with plaster, that their manager informed the plaintiff of the fact and that proper skill and care had been used in the process. The jury, by direction of the judge, confined their attention to one point and gave a verdict for 175% for the injury to the wax model. It was considered as a work of art, but for the future electrotypists and all foundries are likely to decline reproductions unless the owners of the original models will agree to accept all risks. It is well known there are medallions in wax which up to the present have not been reproduced through apprehension of injury to them.

The Architect, June 8th 1894.





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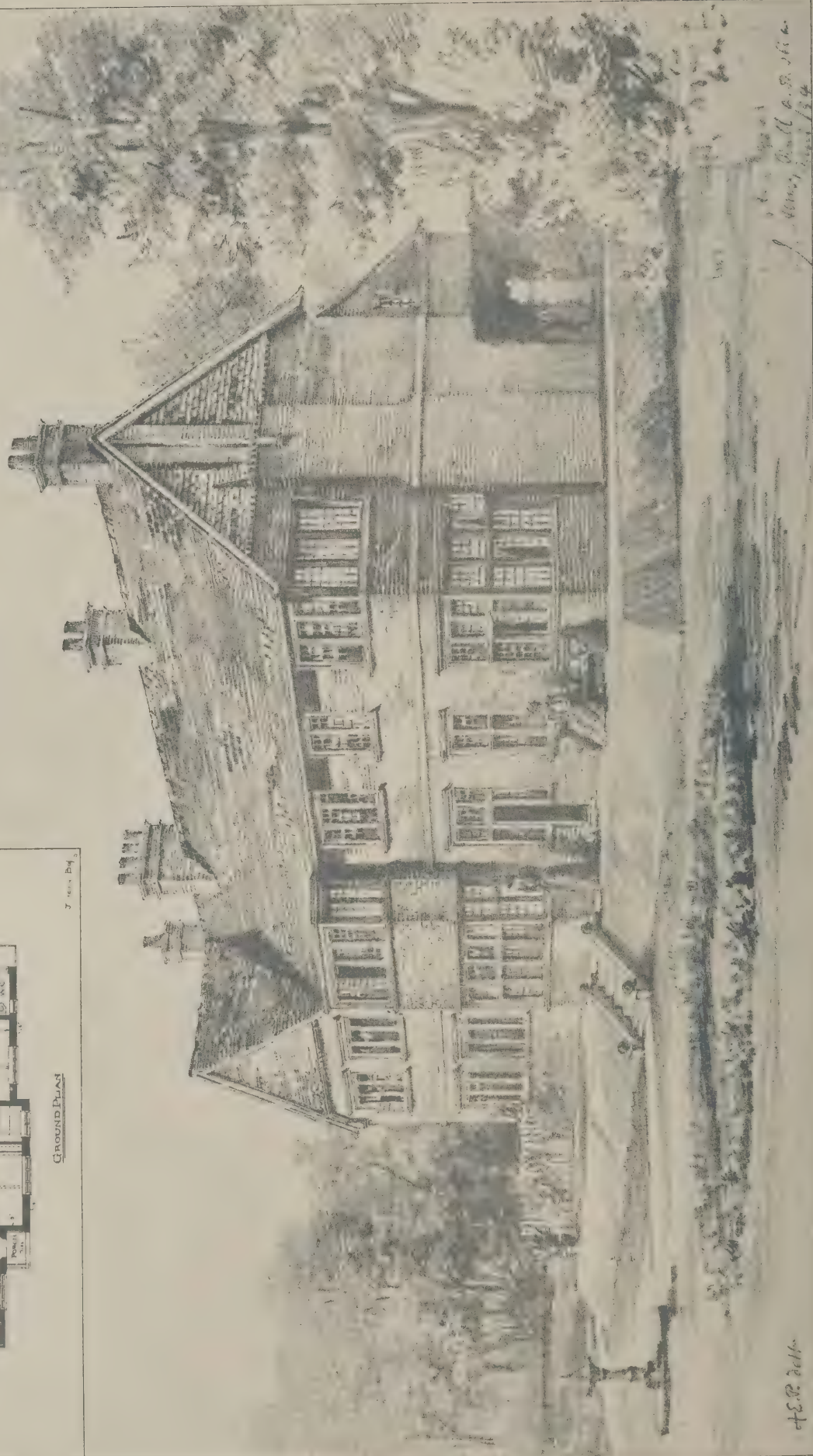
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JAMES B. DUNN, Architect.

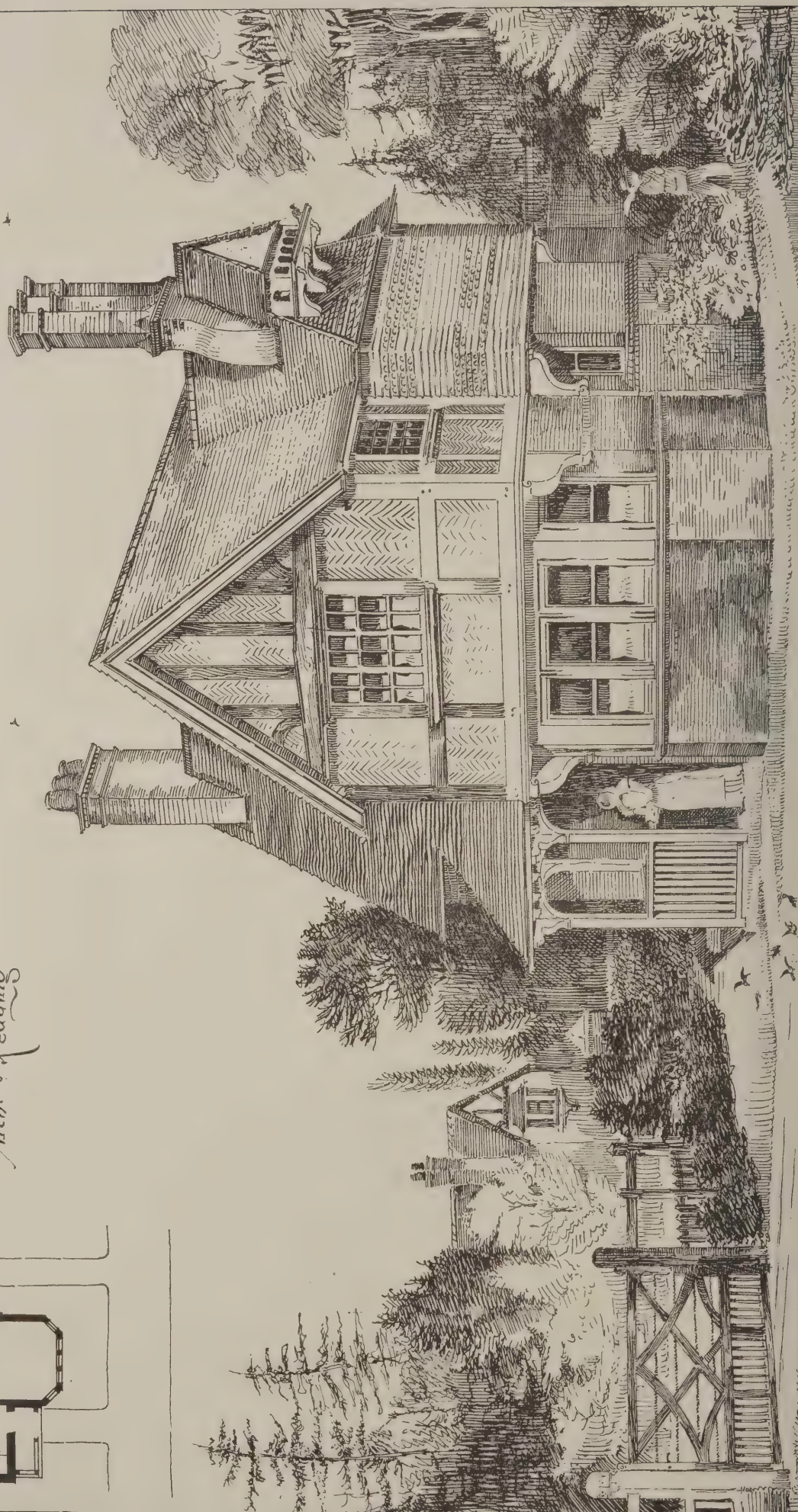
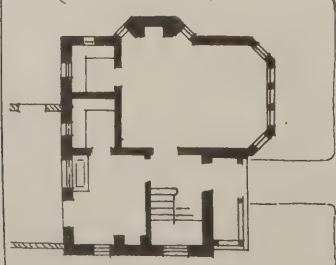


GROUND PLAN

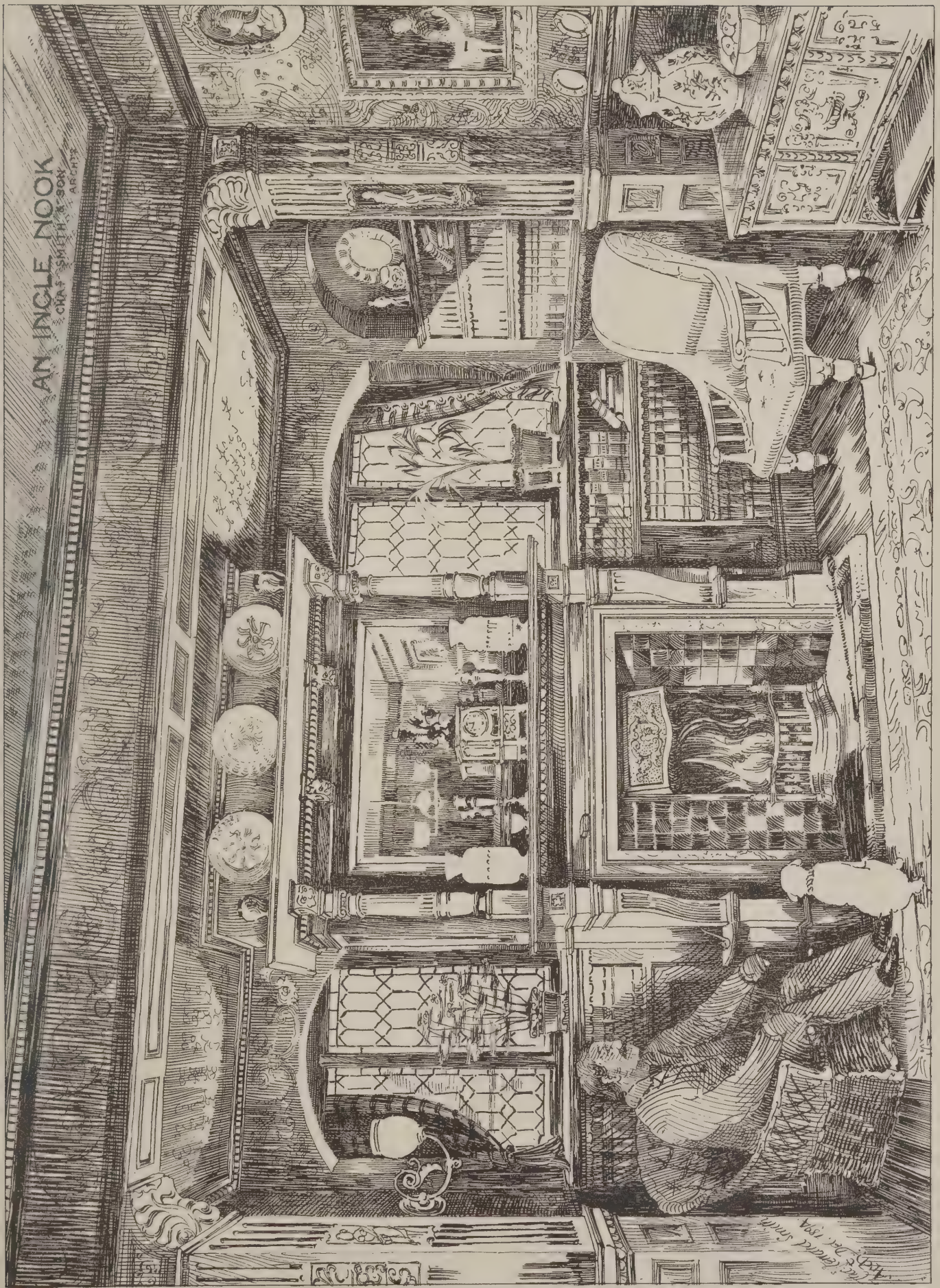
1900



New Entrance Lodge.
DUNORREN-COURT, Hants.
Chas. Smith and Son, Reading.



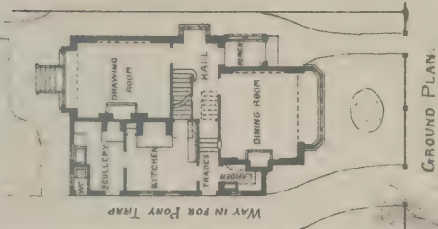
Chas. Smith





The Architect, June 8th 1894.

VILLA RESIDENCE.
ST. ANDREW'S SQUARE,
SURREY.
R. L. BEAUCO, M.A.
Architect.
100, Queen Victoria Street, E.C.



De Vere, 97

ILLUSTRATIONS.

SOLICITORS TO THE SUPREME COURT LIBRARY, EDINBURGH.—
END OF LIBRARY.

NEW ENTRANCE LODGE, DINORBEN COURT, HANTS.

THE entrance lodge which forms one of our illustrations to-day has been recently erected at Dinorben Court, Hants. The work has been satisfactorily carried out by Messrs. J. POOL & SON, builders, under the supervision of Messrs. CHARLES SMITH & SON, architects, Reading.

AN INGLE NOOK.

THE sketch which we publish to-day shows an extension of a living-room in an architect's small suburban house. The length of the room has been increased 5 feet by pulling out the old chimney-breast and inserting an iron girder to carry the breast of room over. The additional space thus obtained is fitted up in oak with book-shelves, cupboards, &c., and forms a comfortable and interesting feature in the room. Messrs. COLLIER & CATLEY, of Reading, were the builders.

PROPOSED HOUSE AT HORSELL.

THIS house is to be built on the hill overlooking the church and village of Horsell. It is so arranged that every living-room and all principal bedrooms face south. The walls are to be faced with Chobham bricks and the roof covered with local-made tiles. Simplicity of plan and style are necessary, as the accommodation shown is provided for 1,800 $\frac{1}{2}$. The architect is Mr. J. HENRY BALL, of 15 Clement's Inn, W.C.

DETACHED RESIDENCE AT SURBITON.

THIS villa, now nearing completion, has been erected facing and in St. Andrew's Square. The nature of the site necessitated cellars under the greater part of the building. The front and sides are in red brick and red tile hanging, the front gable overhanging 18 inches, and having rough-cast, &c.; the roofs also are tiled. Clear lead glazing has been introduced in the windows, and the ceilings of the reception-rooms and hall are panelled. The work has been carried out by Mr. E. H. BETTESWORTH, who has been acting as manager for, and under the superintendence of, the architect-owner, Mr. R. LANO PEARCE, M.S.A., of 100c Queen Victoria Street, E.C., and Surbiton Hill.

THE PRACTICAL SIDE OF TRAVELLING.*

(Concluded from last week.)

THE permissi are a modern invention, a plague of officialism on the field of art, and an ill-considered method of compensating, by State action, for the personal care of the owners, now dispossessed, of their churches. The most justifiable and useful permesso is the free pass at Pompeii, given at the Naples Museum to all who are students, and which frees you from guides and the entrance fees rightly enforced on tourists. Next comes the one to be obtained at Florence, which also gives you the right of a free entry to certain museums and old buildings, but which, like many others, does not confer that freedom of action as to measuring and architects' work which can best be obtained, as a rule, where the priests and monks are still in possession.

At Rome there are no less than three authorities: first, the royal Government, in the Via Ripetta, to obtain a permesso from whom a letter from your consul is necessary, stating that you are an artist, the Royal Institute of British Architects' card not being considered sufficient; secondly, the municipal authority, who have control of the Capital Museum, containing some fragments of architectural detail; and, lastly, the papal authority, for the Vatican Palace and Museum, who must be applied to a few days in advance, and whose form does not include leave to measure. The Vatican is the most expensive building in the world, I fancy, to see over, as at each door a guardian expects something. Go, therefore, provided with plenty of copper. It is also of little use to apply to see parts of interest to an architect which are not shown to the public, unless you can command influence with the authorities. In other places, as a rule, do not apply at all for permission, as it wastes so

much time. In churches and convents observance of the hours of opening and shutting, and taking care not to be in the way of services, will generally suffice to prevent your being interfered with, and will, where there are no officials in charge, as a rule, suffice, as the priests and monks are generally well disposed to artists, and they will often lend assistance in a way that no official would dream of doing. As to working in churches, you need not be afraid to work if a service is going on, provided you are not in the way or in too conspicuous a position, and provided also that during mass or benediction you pay some attention to the bells, so as to cease from working at moments when reverence is required. If, however, it is a feast day, or the church is a specially fervent one, this will not apply, and you will, of course, stop at once on being asked to do so, which will create a good impression and facilitate your work another day. Continental ideas of the use of a church are, as you will soon find out, different from our own; there is more of the public place, museum and temple than of the meeting-place, to be occupied only for so many hours a day or week. Very likely you will prefer your own ideas, but need not any the less observe these while there. I cannot see that difference of opinions can be justifiably translated into outward conduct in foreign churches, especially at service time, and nothing more is expected of any one than an inoffensive neutrality of attitude, especially necessary when the chief places are taken by our ardent sightseers intent on putting through a function. If a cantankerous sacristan should refuse permission to draw and refer you to authorities, it is not always well to hunt them up, because of the loss of time, difficulty of finding them, of making yourself understood, and of working in face of opposition when leave has been obtained. If the sacristan cannot be overcome by persuasion or a bribe, it may be wisest to go on to another place. In Spain, however, the priests seem to have a greater control over their minor officials, and I have found them most favourably disposed to students, regarding leave to draw as a matter of course, which is our view of the question. I often pity the poor foreign student who comes, if he ever does, to England to work, where the making of drawings seems to be considered as a deduction from the value of the property, and a consequent offence, and where many parsons expect to be humbly sued by the poor artist for their ungracious leave to ply his trade.

As to the sight-seeing of show-places, it is of course absurd to spend time in seeing what you do not like, but until you have seen it you cannot know what it is like, excepting by analogy, *i.e.* from having seen similar places, and then you will be very likely less inclined to omit the regulation visit, perceiving that there is some advantage in having seen what the average man sees, and what he will talk about if the subject should be discussed. It is a saying of Goethe's that you will only find in Rome what you take there. Many places owe their attraction to associations, historical and literary, and the charm is absent unless one has some previous acquaintance with them. On the other hand, seeing such places is a powerful motive to reading, giving some actuality to the dry pages of history. Advising students what to see is risky, because they may miss the point of interest for which the particular building is valuable, and may then fall foul of your judgment, as in the case of old buildings, now encased in bad detail, which are only to be realised by the skilled observer.

As to the time to spend in travelling there are two plans—the rush round and the long tour—which both have their uses and are better not mixed. A rush round should be short, say three weeks, and should cover all the important places in the country, so as to gather a general impression of its art, and an idea of what class of work you will take up when you come back again, and it is better to attempt no work at all. I am all in favour of the long tour; the rush round I regard as a useful preliminary, and certainly better than none at all, but a country cannot be studied, as it is, without a residence of some length, and without the exploration of its smaller towns. A brief tour gives one a better knowledge, in one's own opinion, of the country than a longer, when one will feel that one knows nothing, so many are the aspects and causes, that that can be dimly seen beneath the surface. When I made my first rush round Italy it was spring time. Florence was all wind and Venice all rain. The lilac only was out and fields were bare. Where, I wondered at the conclusion, was the Italy of poet and of painter? and I resolved that next time I would go through the summer and autumn in the country. This I regard of great importance. A hot country must be seen in the hot season to understand it, and to appreciate it at other seasons also. Heat can always be supported by observing the customs of the people, which are the results of centuries of experience. From an architectural point of view the long tour is even more desirable, because important things can be undertaken which would not be worth doing in a hurry, and in our work the details have often a great influence on the scheme. Moreover, towns and villages that are not worth visiting, in a rapid review, are worth seeing when time is less of an object, and then we can see what a style means in its

* A paper read by Mr. Bolton at the last meeting of the Architectural Association.

smallest work and often how it originated. Previous to over-running a town consider its history, for towns grow like trees, in successive layers, and street improvements are not a modern invention. Thus, at Rome, the work of Julius along the Tiber contains interesting work of the architects of his age, no other than Raphael and Bramante. Avoid suburbs and outskirts of towns, except where you have reason to expect that churches, once in the fields, have been engulfed in them. Sight-seeing is fatiguing and over-walking should be avoided. The long streets of Paris are a great snare to enthusiasts who fail to realise the distances. On a long tour, when visiting a town, it is best to devote the first day to going round, and it is a good plan to do this with your companion, as there is economy in sharing the fees, and it is generally advisable to make the regulation visit round the chief buildings, and often to ascend the towers or the roofs, both for the sake of the curiosities of their construction and to get an idea of the city as a whole. When doing this first day's visit you should note down what appeals to you most, forming a programme of work which you may, or may not, be able to complete before you have to go on. You can also thus best arrange with your friend as to the duration of your stay by each alternately making concessions.

Sight-seeing is education but not study; sketching is practice in perspective. It is in measuring-up that the special work of an architect consists. That would seem to be most useful as study that most closely resembles your daily work. Work therefore on your usual papers, with usual pens, pencils and colours. One would say that you will best provide against disappointment if you represent your new work in a similar style to that in which you have drawn the old. And it has often been said before that while a painter's picture is his finished result, that of the architect is only a means to an end, the building being the product by which he is judged. I confess to a fancy, however, that there is a value in a rough style of drawing for effects which would shock the conservative, assuming that it is merely supplementary to sound elevation, plan and sectional drawings. In the result, much of architecture is due to the sun, and the value of a photograph is often that of its light and shade. I do not desire, however, to enlarge on this topic, for precept is one thing and what is successful is another, and I could only expect you not to blame me in the result if you had been following your own bent, which is the best advice that anyone could give. The pursuit of a method to its logical end is the truth or reason of many men's achievements.

Sketching is supposed to be a matter of instinct; hints are generally more wanted as to materials than as to methods. In measuring, however, there are certain difficulties which one may fairly expect to have explained. There are practically two ways of drawing buildings to scale, the first the old "measured sketch," which is a ruled elevation to scale set up from measurement of the lower accessible portion of the building, what is not to be got at being put in by proportion to what is known. The other method, the measured work proper, is drawn out, not necessarily on the building, from sketches of every feature, with its measurements attached, the drawings being as it were built up from the various details of the building. The best way to go about the latter method is to rule a diagram of the front on a block of say $\frac{1}{4}$ imperial size, on which your main dimensions will be put, and then to sketch all the various features on sheets of the same size, so that you can keep them all pinned together for reference. Good measuring could be drawn out by anyone, a standard of perfection I do not claim to have reached myself. The greatest difficulty is to get the key dimensions without unnecessary measurements, which serve only to obscure and confuse your work. As to ladders and scaffolding, they cannot generally be obtained, and ingenuity has to supply their place. Much can be done by measuring from above, from the parapet or cornices from one level to another and from window to window sideways, and up and down from a window to strings, and so down to the ground. In one drawing exhibited the problem was to obtain the total height of a building which was a mere shell without any upper floors, the façade being a smooth stone wall, the top of which was inaccessible. Eventually it was done by slinging a plummet at the end of a string right over the top, and drawing up the tape then attached to it until it touched the underside of the top fillet of the cornice. The total height was thus obtained, as well as the projection of the cornice, the height to its underside being ascertained by means of an unfinished cross wall, the top of which was nearly level with some circular attic windows. To get on to this cross wall a rustic ladder of insignificant height was only available, but there happened to be a fireplace in the wall, and as the ladder could be safely stood upright in the recess, and as it is easy to pull yourself up out of a hole if you can get a hand on its rim, the flue proved a possible method of ascent. Thus the attic windows were measured, the height of architrave and frieze and various other details obtained. Spires and tall roofs can be obtained by some methods given in the "Architectural

Drawing-book," but the best way is to climb up inside, as there are generally pieces of wood nailed on to the central posts in the case of timberwork.

I admire, myself, those who do not omit the difficult and tedious work of projecting the corbels of a cornice on a circular part, or the correct setting up of tracery, or those other points of drawing which appeal only to the skilled observer. Arches and vaulting are also not so difficult to measure as they appear, and you should copy out of Spiers' work the methods of doing them, to take with you until you are efficient in them.

It appears to me that there are things which are worth measuring in a diagram style, for the sake of the proportion and outline rather than of the detail, and in these cases it is surprising how quickly by practice such examples can be measured so as to be drawn to one thirty-second or one-sixteenth scales. You will need only the key dimensions, one pillar or pier for the plan, and the general heights only for the section or elevation, and can put in the detail of the style as you like, but such work should of course be distinguished as a measured sketch. Measured work is so laborious that it is not surprising that cheaper methods are common, but the putting of dimensions on to a sketch is not, to my mind, of the value usually ascribed to it; the proportions are not to be obtained thus, and as a rule such dimensions are inadequate if you try and draw out the work, while the possession of old work to the scales you are accustomed to is of great value. What architects differ most in is the number of features that can be crammed into a façade of a given length, and how can scale be learnt save by experience of old work?

In conclusion, the advantages of travel are questioned mostly by those who have not been abroad, and a chance of going modifies much our views of the subject. Anyone will admit of course that why the advantage is often little or none is due to the spirit in which it is undertaken. No one can be taught against his will, and an atmosphere of prejudice will prevent any man learning the most obvious facts. The value of going more than once lies in the fact that the first impressions are most distracting, and I think that a rush round, which gives some general idea of what there is, has a great value as a prelude to a second more serious working tour. And I think this first rush round of the beginner should be taken much earlier—in the pupil stage or, better still, before, as nothing should so open the eyes of the beginner as to what architecture means as a sight of the grand buildings of the past; moreover, time is not lost in this wearing off of the novelty of fresh impressions, as on a second tour work can be better done, the mind being less distracted.

From other points of view it must be remembered that we live on an island, and by imports in art as well as in food, and this importation has been continuous. Hence old work, no less than modern, is best understood when foreign originals have been seen. Canterbury choir is not less liked when you have been at Sens, nor the Reform Club when you have seen the Farnese, and only the other day I was interested in seeing Spanish features in St. Mary's and the cathedral at Bristol. Architecture is wider than nationality, which shows itself mainly in the class of building chiefly required, being better treated in one country than another, and in a certain general stamp of the characteristics of each race, such as refinement, grandeur, vigour, &c., in less or greater quantities.

The greatest abuse of travel is heedless importation of features that have no previous root here, instead of learning how to modify the old for the work of the present. Imported work usually dies out, however fashionable it may be for a time, and a design should not require to be understood by the light of what has been done exclusively elsewhere.

That there is nothing more to learn, owing to the numbers who have been there before you, is a pure delusion. It is extraordinary how the obvious is overlooked. Hundreds had seen the Town Hall at Piacenza, but when brickwork was built on granite with no division between, it was justly regarded as a novelty; and, as Bacon says somewhere, chance is more responsible than pursuit for most of our discoveries, what is known being but a particle of what is passed over.

The importance of travelling may easily be exaggerated, but as nowadays the world in general travels, the architect at least should have seen the more important monuments, as his client will very likely have had that advantage.

From the point of view of examinations I would prefer to spend the fees of all the courses in seeing, rather than hearing, about the buildings and architecture in question. If you have been at Vicenza, Palladio will never stump you, and Scamozzi, Ictinus and others, when you have seen their works, will be no burden on your memory.

The greatest, however, of all the advantages of travel is the acquirement of freedom. Every generation has in art, as in other matters, its own cant ideas and phrases. Travel is emancipation in that art is wider than convention, and a knowledge of all the styles of the past is the best protection against the formulas of the day. When told of such and such mysterious qualities to aim at and this or that method of doing it, you can

reply effectually by quoting some leading building treated on the reverse method; and if that be excluded there will always be another, for art is wide and principles are hard to stretch. As has been said, the subtlety of nature is beyond understanding, so that the theories of mankind are a kind of insanity, only there is no one to stand by and observe it.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

RICKMAN'S LETTERS ON THE ARCHITECTURE OF FRANCE AND ENGLAND.

(Concluded from page 357.)

LETTER V (continued).

8. THE EAST END OF WHITTERING CHURCH, NORTHAMPTONSHIRE,

has some portions of long and short work, and the arch between the nave and chancel is built of large rude blocks of stone with very little attempt at ornament.

This church has a short tower and low spire, and has nothing attractive in the view from the great road, from which it is distant only a few hundred yards, being on the road from Stamford to London, and is nearly, if not actually, the next parish to Barnack. The church is well deserving of attention more than it has received, and is a curiously connecting link between Barnack and Earl's Barton.

9. BRIGSTOCK CHURCH

is another curious specimen, but here the early work forms only a very small portion, though surrounded by ancient remains of such a character as to confirm, as much as their antiquity can do, the earlier date of this portion. The tower is of very rough masonry, plastered, and has a roughly built round staircase on the west side, as at Brixworth. The tower opens into the north aisle by a semicircular-headed small plain door, with a small window over it. The arch into the nave has large plain blocks for impost, and a projecting stone round the arch, like those at Barton-on-the-Humber. The pier of this arch is on the north-east corner of the tower, abutted against by Norman piers and plain arches; the rest of the church has various interesting features of several styles, but nothing more appears now to remain of a character like the lower part of the tower, which has above it a belfry and spire of a date somewhat later than that at Brixworth. There are several good doors and windows, a small water drain, a beautiful niche in the chancel and the stairs to the rood-loft remain.

10. BRIKWORTH CHURCH.

This curious church had not, to my knowledge, been noticed till visited by me in company with my friend G. Baker, the historian of Northamptonshire, near the end of the year 1823, which visit led to a subsequent more minute examination of the building, and a search for traces of the parts which have been destroyed.

This church, in its original state, appears to have consisted of a spacious nave and narrow aisles, a large chancel and a western tower, with a clerestory to the nave, and the chancel divided from it by a large arch. The lower storey of the tower had four doors, one on each side of the north and south, small; the east and west large and lofty. In the upper part of the tower, and looking into the nave, is a window, with two of the rude balusters found in the windows of the tower of the old church at Barton-on-the-Humber. In this state the church would be near 120 feet long, the nave 30 feet wide, and the aisles appear to have been from 10 to 12 feet wide; but as the foundations, which were discovered by digging on the north side, were irregular, this width is in some degree conjectural, although it is not likely to be more than a foot or two wrong. If we suppose 11 feet as the medium for the breadth of the aisles, it will give the exterior breadth of the church, in its original state, 66 feet, as the walls are near $3\frac{1}{2}$ feet thick.

The construction of this church comes now to be noticed, and this is particularly curious, the walls being mostly built with rough red-stone rag, in pieces not much larger than the common brick, and all the arches turned, and most of them covered with courses of bricks or tiles, as they may be called, precisely similar in quality and size to those found in Roman works discovered in this country, and over the balusters of the window looking from the tower into the nave, these bricks are used as impost.

The great arch, between the nave and chancel, has, at an early period, been partly taken down and filled up with a good

pointed arch; but this was not so completely done as to destroy the remains of the spring of the original arch, which, on stripping the plaster, was found to have the same tile impost and tile arch and course of covering tiles as are found in the other arches. At what date the church remained in its original state I do not presume to determine, but from the nature of the alterations now extant it must have been very early, and I now proceed to state these as they appear.

The north door of the tower is stopped up, and against the west side of the tower is erected a circular staircase, built of the rag stone in a very rough state; the stairs are partly remaining, and the under side of them has been formed upon rough plastered centering, in the mode usually adopted by the Normans. To afford access to this staircase the original west door of the tower has been partially stopped, and the aperture is a small circular-headed door. There is no other access to these stairs, and they lead to the two storeys of the tower, reaching rather higher than the present remains of the original steeple, upon which is now a belfry and lofty spire, of a style which may be considered of from 1300 to 1330.

Proceeding eastward, we find the original aisles destroyed, and the westernmost arch on the south side remaining to its original use, but now leading into a south aisle, nearly of the date of the belfry, and to give access to the eastern part of this aisle the wall of the original chancel on the south side has been opened and two arches inserted, which are dissimilar in their shape, range and mouldings. In the arch next the tower on the south side is also inserted a door, and of such a character as to fix its date to about the year 1150; it is covered by a porch of a date somewhat later. We now come to the present chancel, which is an addition eastward of the original one. The east end had originally one large window and two small ones; the lower part of the large one has been opened to the ground, widened, and the upper part supported by a wood lintel resting on two wooden uprights, against which are some remains of a Perpendicular wood screen. Eastward, the present chancel consists of portions of each of the four styles; on the north side, joining the old chancel, are parts of two Norman divisions with small flat buttresses, and such a direction as to make it probable that this Norman chancel was multangular eastward. In these two divisions are inserted two windows, one a Decorated two-light window, forming a north low-side window, the other a Perpendicular two-light, which is so inserted as to preserve above it the Norman arch of the window originally lighting that division. The rest of the chancel below the string is Early English, and has Perpendicular windows above; on the south side is a Perpendicular door and a low-side window of the same date. The nave is now lighted by six windows inserted in the old walls, all of different sizes, and, with the exception of two, which are alike, of different dates. A vestry has been formed in the nave, opposite the porch, and a wall built across the nave at that part, forming a screen; the vestry is lighted by a small window, differing from any of the others.

This church has been thus particularly described on account of the extraordinary preservation of so much of the original structure, amidst alterations which appear to have been carried on from the time of the Normans to the Reformation about every fifty years, for so diversified are the different additions and insertions as to character; it is also curious for the discovery of a relic in a small shrine, which appears of the age of the south aisle, and was inserted in the south wall near a window. Interfering with a seat, it was taken out of the wall, and behind it a cavity was found containing a small wooden box in which was a small bone, which, with the shrine, is carefully preserved.

11. EARL'S BARTON, IN NORTHAMPTONSHIRE.

This tower, which, as well as that of Barton-on-the-Humber, has been engraved in Britton's "Architectural Antiquities," is apparently of the same character, but more ornamented, and with rather more finish of workmanship; it is, however, still rude compared with most Norman work, and its west door has a curious approximation to Roman work in an impost with flutes, and a rude moulding over it, similar to a Roman architrave. The baluster is used to the windows; the number of stone ribs is greater than at Barton-on-the-Humber, and the upper storeys of the tower diminish in size a few inches each way, less than the storey below. This tower so clearly resembles Brixworth in the baluster, Brigstock in the work about the door and Barton-on-the-Humber in general character, that there can be little hesitation in considering them of the same class, and the tower of Barnack before described assimilates also in several points to Brigstock and Earl's Barton. The church of Earl's Barton is highly interesting, exclusive of its curious tower. The chancel below the window, the south door of the church and some other portions are Norman, good and much enriched; other portions, both of church and chancel, are Early English, and the north door and some of the windows are Decorated, while some inserted windows and the clerestory are Perpendicular. There are two Early English water-drains and

three Norman stalls. There have been low-side windows to the chancel, but they are now stopped. The arch from the tower into the nave is evidently an insertion of later date than the rest of the tower; it is partly Norman to the spring of the arch, and Early English above.

12. THE TOWER OF CLAPHAM CHURCH, BEDFORDSHIRE.

This tower is wholly plastered and rough-cast outside, and therefore does not show the long and short work; but a very attentive examination of the interior of the tower, the construction of the windows, the absence of a staircase, the great thickness of the walls, the material used (small rag stone) and the general appearance induce me to include it in this list of early churches. This church is very near the great road about two miles north of Bedford.

13. THE TOWER OF THE CHURCH OF ST. BENET, IN CAMBRIDGE.

The long and short portions have been here obscured by plaster and rough-cast; but during the sitting of the British Association at Cambridge in the year 1833, I had permission of Dr. Lamb, master of Corpus Christi College, to remove so much plaster as should settle the construction of the tower, which was done, and the long and short masonry clearly developed. The arch from the tower into the church (a large semicircular one) resembles the arch at the west end of Kirkdale Church in a degree of approach to Norman, and the impost and arch mouldings assimilate it to Barnack and Earl's Barton, while certain rude animals, in the place of a drip supporter, add another curious feature. This tower is not sufficiently known, being a good specimen and in excellent preservation; it has the baluster belfry window and no staircase. The west door and window over it are insertions.

14. THE TOWER OF THE CHURCH OF ST. MICHAEL, IN OXFORD.

This tower, like Clapham, in Bedfordshire, was till very lately covered with rough-cast and its curious features only to be guessed at from a baluster belfry window, and the small rude rag-stone walling of the interior, with the absence of a staircase; but on recently passing through Oxford I was glad to find the rough-cast stripped off from the outside, and its long and short features clearly displayed. It now stands out a decided and good specimen of the long and short work.

15. TRINITY CHURCH, COLCHESTER.

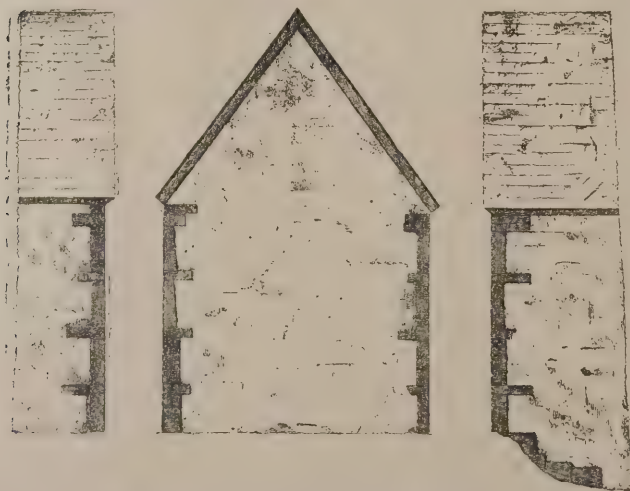
Of this church only a part of the tower, the west door and a small portion about it are of early date, but this small part is curious from its near approximation to Roman work, being plastered over bricks, and also from its having a straight-lined arch. The arch into the church is semicircular and of small ragstones or brick, *i.e.* flat tiles.

16. THE CHURCH OF STOKE D'ABERNON, SURREY.

This church has the chancel arch and east wall of long and short work.

17. THE CHURCH OF NORTH BURCOMBE, WILTS.

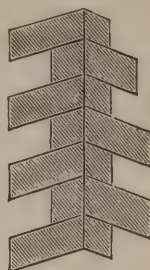
This is a small church close by the roadside from Wilton to Hindon; it is only the east end of the chancel which appears



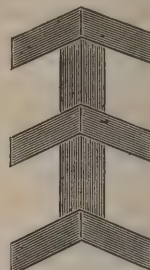
CHURCH OF NORTH BURCOMBE, WILTSHIRE.
East End of the Chancel and Returns.

to be part of the original building, though the rest of the church is principally of Decorated date, and has proper quoins of the usual size and alternate bonding into the wall, and thus this church offers a good specimen of both sorts of masonry which are not commonly found together.

Both the long and short pieces and the quoins are of the oolite common in that part of Wiltshire, and are in very good condition, and the edges sharp, affording another proof of the value of that description of stone. The walls are flint and rag



Quoined work.



Long and short.

and some rubble, but the east end is plastered and rough-cast, as well as part of the sides of the chancel, and therefore I cannot tell whether there is any east window, or ever has been, as the plaster, both inside and out, shows no trace of any that I could discover.

18. BRITFORD CHURCH, NEAR SALISBURY.

In this parish was, I believe, a palace of Edward the Confessor. The church is a cross church, and seems to have been rebuilt and patched at various times, but there still remains a north and a south door, which are evidently Saxon, and there is another aperture rudely stopped, and a window, also stopped, with a buttress of much later date before it. This last-mentioned aperture and window are not clear as to date, but the north and south doors are curious. The former is of stone in small thin pieces, long and short wise, with a plain impost to spring from; the latter is also composed of long and short pieces of stone, with a few of the flat tiles called Roman bricks, and the arch turned with these bricks, and large joints of a mortar evidently composed of lime, flint and pounded bricks. These doors are now both stopped. The south door forms an important link with Brixworth Church by the mixture of brick and stone.

19. THE CHURCH OF WORTH, IN SUSSEX,

appears to have some long and short work, but as I have not been yet able to visit it, or otherwise to ascertain exactly its arrangement and construction, I notice it only as a church deserving of more attention than it has hitherto received.

20. SOMPTING CHURCH, SUSSEX.

This most curious tower I have recently visited, and have found it clearly of long and short character, but presenting some singular differences from others. Here, as in most, the corner-stones are long and short, but the transverse or short pieces are no longer, or rather broader, than the long ones, and they are mostly of a different stone.

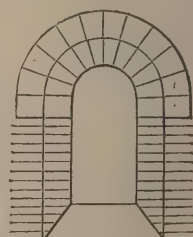
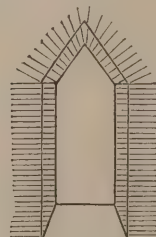
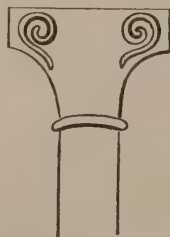


Ordinary long and short.



Long and short at Sompting.

This tower is large, and the whole of the north side has been taken down and rebuilt to form a side of a chapel, part of which now remains, but this only applies to about fifteen feet of



the lower part, all above is ancient. There is a window, now stopped, on the west side of this tower which appears to be an original one, and which has the small thin long and short work, like the north door at Britford. The opening into the church from this tower is not in the middle, but on the south part of

the west wall, and has on each side a column and two pilasters; the former with a rude capital not Norman, but having much of a Roman character, and like a Corinthian cap with the volutes and curls of the leaves broken off; the pilasters have a sort of impost with a boldly cut scroll, the relief and character of which are also much more Roman than Norman. This tower has no stairs, and in its upper windows has a plain round centre instead of the baluster, but having a top with a rude sort of volute, and in several parts of these windows I found Roman bricks, or flat tiles, and some of the windows had semicircular heads and some straight-lined heads.



This tower has a middle rib which becomes rounded above the first storey, and is flat below; that first storey has over it an ornamented string with a sort of cutting I have never seen elsewhere, and unlike any Norman ornament.

This string is about 9 inches thick, and is so decayed that I could not satisfactorily ascertain its section, but I believe the above is near what it is.

This tower is lofty, full 100 feet to the point of the slated sort of spire; it has four gables very pointed, and thence arises the spire.

The church is a cross church with no aisles, except an east aisle to the transepts; the north has three round piers and two arches, and the south one arch only; the whole of this is mixed with very late Norman and Early English, and appears all before 1200, except the woodwork of the porch and perhaps its stonework, and some Perpendicular inserted windows. On the whole, this is a very curious church, and deserves to be studied with great attention.

Having now gone through the list of twenty churches which I have described with some minuteness, in order to excite an interest in this valuable study, and also to show their connection (and I have left much undescribed, that they may be visited and studied by others), I proceed to make a few general remarks.

I beg first to say that in this interesting investigation I owe much to the zeal and activity of my friend William Twopeny, Esq., of the Temple. For the knowledge of several of these churches I am indebted to him; he first discovered and

examined the two extremes, Whittingham and North Burcombe, each of which I have since visited, and found peculiarly valuable.

It is curious that of twenty churches the names of seven, or more than one-third, begin with the letter B.

It is also curious that no one of the towers appears to have had a stone stair. Those at Brixworth and Brigstock are evidently additions outside, and at Barnack obviously so inside. They have all ladders, and I find no vestige of any original stone stair; at Whittingham is a sort of vault and rude stair a little way up, but I do not think it original. The very extensive under-building which appears at Earl's Barton to introduce the arch into the nave, and at Sompting to add the decorated side chapel, are very curious, and show great boldness of practice. In the latter, short and thick buttresses have been added to the tower, evidently when this chapel was built; and a west door and window inserted in the lower storey of the tower at the same time.

The term Roman brick will, I hope, be easily understood. Though I by no means wish to assert that all these bricks were Roman, I think it not unlikely that the Saxons retained the art of making them. The brick I mean differs in shape from modern brick, and more resembles our present large paving tile; they are of various dimensions, nearly, but I believe seldom quite, square, between 14 inches and 11 inches on the sides, and rarely much more than 1½ inches thick.

As the terms "rag" and "rubble," though very clear when known, are sometimes confusing to those not acquainted with various masonry, I may say that by rag I mean stuff of many qualities in different counties, but being flat-bedded stuff, breaking up about the thickness of a common brick, sometimes thinner, and generally used in pieces not much larger than a brick, it is found laid in all directions, though generally horizontally. This stone is often very hard, and frequently plastered and rough-cast; but in some counties neatly pointed with large joints and looking very well. Rubble walling is generally of pieces more nearly approaching to a cube, with great irregularity of size and shape, as well as hardness. This also is often plastered, but sometimes well pointed with large joints, and

left outside; it is, however, much more used as backing behind ashlar work, and often of very bad materials. I once took down a fine Norman tower, in parts 7 feet thick, and the wall consisted of two skins about 9 inches thick of sandstone ashlar, and the whole of the interval filled in with mere mud mixed with a little lime. In all these early churches the materials are generally hard and well consolidated.

I fear I have occupied too much of the valuable time of the Society, but I could not well compress what I had to say in less compass, and I was desirous of presenting at once to the view of the members all that I at present know on the subject, that others may be induced to engage in this interesting pursuit, and thereby my list of twenty churches be increased, for there are several others that I hope will, on careful examination, prove to be of this early date. I do not mention them, because I wish not to mislead by noticing what may be curious; but rather, that by closely studying these examples, the student may have his ideas of this style carefully fixed, and then explore for himself in the many parts of England where our churches have not, to any extent, been properly examined.

As I wish not to delay this paper, I have not been able to prepare drawings for so many as I could desire; but this is the less important, as the examples not drawn are mostly engraved in various architectural publications.—I remain, thine truly,

THOMAS RICKMAN.

MITLA'S ONE MYSTERY.*

THE present village of Mitla may be said to occupy the site of the ancient city of Mitla, if there was such a city, which is by no means certain. A little river, which swells inordinately after heavy rain, runs through the centre and divides it into north and south, the ruins being in the former section, partly mingled with the small houses and gardens of the present inhabitants. Their numbers, fortunately, are not great, being a little under 2,500 persons, or otherwise nothing would be left of remains which are in some respects the most interesting in the world, for, frankly, I believe that there is not a house in the place whose walls were not built with stones taken from the palaces of Mitla. I call them so, not that I believe them to have been palaces, but because the name has been given to them, and will probably stick. The Indians call them the forts of Pezelao, and Father Burgoa in a work which he wrote upon the State of Oaxaca, and which was printed in Mexico in 1671, calls them cemeteries, probably from traditions related to him by the Zapotien Indians.

But it is highly probable that the name of palaces was restored by the first Spaniards who came into this region, and who left peculiar traces of the ardent admiration which they felt for these structures. They built a church in the court of one of them and established the residence of the curé or priest in the small halls which connected with the patio, putting on roofs and repairing here and there slight breaches in the walls. They took every stone from a truncated pyramid about 35 feet high and built a small calvario on its platform, turning its patio into a village cemetery. Then with the stones, which were all treads and risers, they endeavoured to build a wall on the same principle of construction as that used by the unknown builders of these palaces. This is, I believe, the only spot where the Spaniards practised that imitation which is the sincerest flattery; but their success was far from gratifying, and the wall which is in the presidio or square of the southern and official section of the village is still extant, a monument indeed of durability, but also a proof that the conquerors did not understand the architecture of these ruins in its most essential details.

There were, when Burgoa wrote, four structures independent of the church and the calvario. Of these two are in fairly good condition, one has been divided up into cabins by the people, and the fourth seems to have disappeared totally. As the differences between those that are extant are very slight, it is probable that archaeology has not sustained an irremediable loss by the disappearance of two of the four. All seem to have courts, the halls being arranged around the western ends and connecting with small interior courts. The two that remain are built upon a platform about 6 feet high and somewhat more than that in width, but in what manner access was gained to the platform must be left to conjecture. In all probability the whole structure was surrounded by flights of steps constructed like the pyramid, which was in fact all stairs, and these of so gentle and gradual a rise that tottering infancy and decrepit age could have mounted with comfort.

The walls of the first palace, or that to the north, consist of a central core 6 feet thick, covered by worked stone slabs of less than as many inches. The core is a kind of artificial plum-pudding stone, made of concrete and stones of all sizes. The concrete was made of lime and clay water, and as the clay was black the conglomerate was black also. I could not see

* A communication from Mexico by Mr. Edward Garczynski, published in the *San Francisco Chronicle*.

any part of the foundation, save of the platform. The outcropping stones in the soil had not been removed, but were worked into a compact mass with other stones in their natural condition by a plentiful use of concrete. All the lower courses of stone above the platform have been removed for building purposes, except those at the corners. The probability is that there was one course that slanted like a drip-course, for traces of this are found in both buildings. These rested upon another course, particularly broad, of which there were several, and the last upon a narrow course which rested upon the concrete of the platform. Every stone upon the exterior of this façade fits to the stones above it and below it and on each side of it so exactly that it is impossible to introduce a hair between the joints. They were so thin, in many instances less than 3 inches, and never more than 6 inches, that to keep them in position could not have been effected by the mere contact with the cement of the core. It was necessary to get some pressure on them, and this was done by giving a slight overhang to the wall, which is not the least out of plumb, but was built that way so as to press the stone against the cement of the core.

The wall is divided into compartments by binding courses of worked sandstone invariably yellow. These come out from the core only a few inches, leaving great spaces of cement-covered wall, and these were filled in by a most singular kind of mosaic work on a system based entirely upon geometric forms. The stones are of the same yellow sandstone as the binding courses, and vary extremely in size, some being not much more than a cubic inch, while others are more than a foot in length. It is as certain as anything that is guessed at can be that these mosaic stones were made by the hundred or the thousand, and workmen put them in place precisely as our brickworkers lay brick. There is no particular finish of workmanship about them as has been reported, many showing great hurry or great carelessness. What is singular is that it would have been impossible for the workmen to put them in place, or to put in place the corner-stone and the binding course, unless they had drawings, and unless there was some system of numbering them. The pattern, so to speak, shifts continually, but there is always the same degree of relief and the same result of chiaroscuro.

In the name of art, who were the men who comprehended architectural chiaroscuro in this pre-eminent degree? Not even in Greek mouldings is there the same extraordinary handling of flat surfaces. There is an exact and most beautiful balance between the masses of worked salient stone and the mosaic panelling, and when the sun falls upon the latter it becomes a golden network. The façade of the first palace faces exactly west, and receives all the glory of the setting sun. In this light the visitor realises what mighty men there were in the olden time. The plane surfaces are all aflame, the relief panels become transformed, the lines wriggle like living things and the shadows are full of suggestions and mystery. Then does he comprehend that the men who planned these buildings belonged to a higher civilisation than ours, and that they made their structures a part of the landscape.

The system of decoration, external and internal, is all geometric. The inner court of this palace affords an excellent example of Mita mosaic relief. Almost all are modifications of the zigzag which used to be called the Grecque, because the idea once prevailed that it was a Greek invention. It is seen on one of the mouldings of the principal pediment of the Parthenon. But it is far more Mexican than Greek, and if it was not indigenous here, which is possible, it certainly was carried from this continent to Europe. The steady tendency of most advanced modern thought is to connect Mexico with the Chinese, Japanese, Hindoos and Persians; but it is immaterial in what way this connection took place, because it is difficult, if not impossible, to reconstruct the continents and oceans as they were before the last cataclysm in the year 1000 B.C.

I regret exceedingly that I was unable to secure a photograph containing the mosaic panelling of the zigzag with a small Maltese cross in the centre, which is to be found in one of the halls. Many readers refuse to believe that the cross continually recurs in Mexican antiquities. The very famous cross of Palenque is so turned and twisted and scrolled and decorated that those who deny it to be a cross and assert it to be a tree are not without some show of reason. But at Mita there is an entire panel of Grecque mosaics, in the centre of which is a plain cross with all the arms of the same length. On the lintels of the entrances the geometric designs are sculptured in low relief upon the stones, which are of enormous size and weight and are supported by large monolithic jambs, but the latter are undecorated. The lintels go very far beyond the jambs, obtruding their ends among the mosaic-work, and the two match so exactly that it is only by following the lintel with the eye that one can tell which is which. In some of the interior walls there is a marked inferiority in the planning, for no care was taken to make the corners come out even, and the workmen seem to have settled the matter by breaking the

mosaic stones to make them fit the space without paying any regard to the look of the work.

I cannot leave this branch of the subject without pointing out that the exclusive use of geometric designs in decoration, outside of Mexican antiquities, has hitherto been found only in Phœnician bronzes in Ireland and Scandinavia, the only two regions in which these bronzes occur numerous. Archæologists have been so accustomed to accept this as axiomatic that the question has been raised whether bronzes with leaf decoration found in those two localities should not be considered as of another origin. No analysis has been made of the bronze to determine the fact, because all Phœnician bronzes vary in the amount of tin, ranging from 10 to 14½ per cent., and the mere appearance of these objects shows clearly that they are an amalgam of copper and tin, and contain neither lead nor zinc, like Etruscan and Greek bronzes. It is not good science to have one general law for European archæology and another for American. If the standard with regard to geometric decoration is worth anything, then these buildings must be Phœnician.

One of the halls of the north palace has a row of columns running from end to end. They measure 11 feet in circumference and are about 17 feet high. These appealed strongly to the imagination of Father Burgoa, who wrote about them as if they were something very wonderful. I cannot admire them, nor can I believe that they were a part of the original structure. They are of a tetzoube or volcanic tufa, much like basaltic rock. They are black cylinders, so to speak, and no more, having neither base nor capital. If, as Burgoa wrote, they supported a roof, then the latter also must have been an addition, taking the place of something that had been destroyed. If we regard these shafts as having been made by cave-dwelling savages, and the Zapotians were nothing more, then we must wonder at the industry with which men with only the appliances of neolithic man worked these monoliths into shape. But they would not have done this without some inspiration, some model, and these columns resemble very exactly the two which were in the great Phœnician temple of Gadir, now Cadiz. In the centre was a rude unworked cylindrical stone, which represented Asto or the Sacred Tree, and on each side were these two columns in bronze without bases or capitals, and they were known as the pillars of the two Hercules, for there were two, one with a goat skin, the other with a lion's skin. Their memory is still preserved in the dollar mark. For some reason the Spaniards removed one of these columns from another part of this palace, for they occur in other places besides this hall, and deposited it in the village presidio. But they broke it in transit.

CADDINGTON.

THE members of the London Geologists' Association and of the Herts Natural History Society, to the number of about fifty, held, the *St. Albans Times* says, an interesting field meeting on Saturday, the 2nd inst. The archæological department was conducted by Mr. Worthington G. Smith, F.L.S., of Dunstable; the geological by Mr. A. C. G. Cameron, H.M. Geological Survey, of Bedford; and the botanical by Mr. James Saunders, of Luton. The company assembled at the Midland Railway Station, Luton, whence they proceeded to the parish church, the inspection of which furnished many points of interest. The construction of the tower, which is of Tottenhoe stone and upper chalk flints in alternate cubes, thus illustrating the use of local materials in its construction, was commented upon. In the interior, the ancient font, its ornate canopy, the Wenlock chapel, the fine oak carvings and the quaint inscriptions on some of the tombs occupied attention during the brief visit. The company then walked through Luton, by Farley Green to Woodside and Slip End. Between these villages are some excavations for brick-making, to which Mr. W. G. Smith conducted the company, and some half-dozen others lying near Caddington, in which that gentleman has discovered an old Palæolithic land surface surmounted by relict Tertiary and contorted red drift. It was the opinion of Mr. W. G. Smith, as the result of long and careful investigation, that an ancient lake existed at this place, and the primitive inhabitants, who lived either in huts by its shores, or possibly constructed on piles above its surface, have left many relics attesting their occupation of the site. These consisted chiefly of flint flakes of all kinds, most of which have edges nearly as keen as knives. Many hundreds of these, as well as numerous well-formed flint tools, have been brought to light, specimens of which are in the collection of Mr. W. G. Smith, at Dunstable. That these flakes were made on the spot is shown by the fragments found which have been struck off, and in many instances the gentlemen referred to have, with great skill and pains, reunited the detached portions and built up the flint with a close resemblance of its original form. In one of the pits near Caddington numerous fragments of Roman pottery have been discovered, and in other places in the neighbourhood cinerary urns, stones used, when heated, for

pot-boilers, and numerous other relics of the ancient and prehistoric inhabitants have been unearthed, and now form part of the extensive collections of antiquities which may be seen at Dunstable. Between Caddington village and Zanches farm a Saxon tumulus formed an interesting object for inspection. Close to Zanches farm is an old pasture believed to have been a place for making bricks or tiles in Mediæval, or perhaps Roman, times. It was pointed out that in the construction of the farmhouse, notably in the chimney, Roman tiles were used, which may have been obtained from excavations on the site, or from an older building which the present edifice has replaced. From this point the company walked to Blows Farm, at which place some hollows in the hillside were pointed out, which were the remains of early British hut foundations. Deep excavations were made by these primitive inhabitants, which were roofed in by skins, &c., these hollows forming more effective shelter than tents erected on the surface. From this point, some 600 feet above the sea-level, is an extensive view to north and west, embracing Dunstable, the Five Knolls (ancient tumuli), Kensworth Hill, 800 feet on the middle chalk, Totternhoe, with its evidences of early British and Roman occupation, the two Roman roadways, namely, Watling Street and Icknieldway, which cross each other at Dunstable, and beyond a gault plain bounded by distant hills of lower greensand. A smart shower now rendered it imperative to seek the shelter of an establishment at Dunstable, where substantial refreshments were provided for the weary excursionists. At the close of the repast, the President of the Geologists' Association made a complimentary speech upon the effective manner in which the arrangements for the day's proceedings had been carried out, and a vote of thanks to Mr. Worthington Smith was carried by acclamation.

ENGLISH ARMOUR.

OF the military equipment of the Saxons and Normans, who in the year 1066 contended on the coast of Sussex for the mastery of England, and of their immediate descendants, a few corroded swords, blades, single spurs and bosses of shields may be said to be the only relics that have been handed down to us. Even the best authenticated of these cannot be precisely dated, and, if they could, would furnish us with but little useful information. It is from the illuminations, rude as they are, in the MSS. of the eleventh century, and that most interesting and fruitful subject of antiquarian controversy, the Bayeux tapestry, that our imperfect knowledge of the armour and weapons of that period must be drawn, confused more than assisted by the vague expressions to be picked here and there out of the prose and poetry of contemporary chronicles and romances. Whether the "Gehringed Byrn" of the Anglo-Saxon was composed of metal amulets forming a garment of themselves, as is darkly hinted by Bishop Aldhelm in his enigma "De Lorica," or stitched flatly on a tunic of quilted linen, cloth, leather or other material, remains still to be proven. An inference favourable to the latter hypothesis has been drawn from the fact that not the smallest fragment of such a garment has yet been discovered, as it is fairly presumed that the linen or leather having decayed, the rings would drop off, be scattered, lost, or used for other purposes. On the other hand, we may actually be in possession of some ringed byrn without knowing it, as it would be impossible to give an exact date to many of the pieces of chain which are occasionally brought to light. The same observations may apply to the early Norman hauberk (halbers), which, judging from the pictorial representations of the period, was composed not only of rings but small plates of various forms, and studs and bosses, which must have required the support of some other and flexible material. With the hauberk of linked chain, which in the course of the following century became the principal defensive body armour of the knight throughout Europe, was worn a large, cumbersome, cylindrical flat-topped helmet (the heaume of the Normans), with a transverse opening for the sight only. The heaume, with a grated vizor opening with a hinge, continued to be used during the reign of Edward I., but towards the close of it the crown of the heaume became convex, and, finally, conical. To the hauberk of chains, chausses (pantaloon) of the same material had been added in the twelfth century, and to both were now superadded protections of plate. Poleyns for the elbows, and genouilliers for the knees, appear during the latter half of the thirteenth century, and greaves or bainbergs for the legs are seen in painting and sculpture, and named in wills of that period. The war helmet of the fourteenth century was worn with or without a vizor, and attached to it was a curtain of chain to protect the neck, called a camail. Over it, the vizor being removed, was worn the ponderous heaume, the crown of which had taken the conical form necessary to fit the bascinet, and was surmounted by the torse or wreath of the wearer's colours and his crest, which is never seen on the bascinet. In the reign of Richard II. a singularly-formed vizor was attached to the bascinet. Varieties of it, some beaked like a

bird, are to be seen in sculpture and painting from that period to the middle of the fifteenth century. The reign of Henry V. is chiefly remarkable as the era of complete plate, which during the fourteenth century had been gradually superseding chain, but we are still without authenticated portions of the body armour of that date. Feathers were also first worn upon the apex of the bascinet about the same period, that head-piece assuming occasionally a more classical form, resembling the ancient Greek helmet. Several examples exist of the armour used in the reign of Henry VI. The back and breast-plates were of an elegant form. The toes of the steel shoes (sollerets) were sharply pointed, a fashion which, towards the middle of the fifteenth century, was carried to the most extravagant length. The successor of the bascinet was called the salade, or sallet, from the Italian "celata," the face being protected by a large chin-piece, called the "house col." The shield had an opening at the side, called the bouche, for the passage of the lance. The shank of the spur at this period was extremely long. During the reign of Edward IV. greater attention appears to have been paid to the defence of the knight in the tournament. Additional pieces were invented to protect nearly every part of the body, and fastened by screws over the ordinary suit. The close helmet, with vizor and bevor, also appear during this reign, and gradually superseded the vizored bascinet and the salade and hause col. The short reign of Richard III. seems to have been only distinguished by the more elaborate ornamentation of armour, particularly of the elbow and knee pieces, which display large fan-like terminations; but it would be difficult to assign positively any piece of armour to the period within the three years of his domination, and the next great change must be attributed to the accession of Henry VII., of whose reign pass-guards at the shoulders, fluted suits with short waists and very globose breast-plates, sometimes also finely engraved, are the principal characteristics. The suits of Henry VIII.'s time are principally remarkable for the form of the breast-plate, which presents a salient angle called the tapul, and of the solleret, which assumed a breadth at the toe as extravagant as was the point in the previous century. In fact, armour appears generally to have followed the fashion of the civil attire, and the square-toed shoes of this reign, the puffed, slashed and ribbed doublets, and the full, fluted skirts or bases of them, are all to be seen imitated in steel. One of the distinguishing features of the sixteenth-century armour is the gradual descent of the angle of the tapul before mentioned, from the centre to the very bottom of the breast-plate, till the point projects in a curved or beak-like form immediately over the waist-belt. In the next century it entirely disappears. Another characteristic is the superb ornamentation which the revival of art on the Continent extended to the craft of the armourer. An open head-piece called a morion was very generally worn during the sixteenth century. These were also elaborately engraved and embossed. The use of armour gradually decreased during the seventeenth century, the improvement in firearms, perhaps, being the principal cause. Armour for the legs and feet was abandoned in the reign of Charles I., and by the time William of Nassau landed at Torbay little remained of the iron panoply of war beyond the breast and back-plate.

ARTS AND CRAFTS IN IRELAND.

THE Council of the Royal Institute of the Architects of Ireland having considered the proposal for an arts and crafts exhibition, in Dublin, have come to the following conclusions on the subject:—

That the Institute of Architects most cordially welcome a well-organised exhibition to stimulate development of arts and crafts in Ireland by Irish hands.

With respect to those arts and crafts subsidiary to or related to architecture and building, this Council is of opinion that it would be a praiseworthy object of such an exhibition to do justice to the high standard of excellence attained in some leading crafts, and to bring into recognition the individual authorship of such craft as is honourable to Ireland, such crafts being more pre-eminently stone and wood sculpture, wrought metalwork, and plaster modelling for reproduction in stucco-work, metal or other materials.

The Council must, however, recognise that by far the most important function of an arts and crafts exhibition in Ireland would be to mark those other arts and crafts which have either disappeared from or have never been introduced to meet modern demand into Ireland. It is to the constant regret of architects that money is diverted under their hands to England, Scotland and the Continent because there is no production of such art and craft in Ireland at the present time to meet demand.

Such arts may be classed as glass-painting, encaustic tiling, paper-hanging, design and printing; lincrusta wall and ceiling, lining papier maché, fibrous plaster and such pressed moulded appliances, mosaic in its several applications to walls,

ceilings, &c.; mural decoration in painting, sgraffito and other media; terra-cotta work, lockmaking and lock and door furniture, and all used and decorative ironmongery belonging to buildings; sanitary appliances and goods of every sort, cast-iron work of every ornamental and ordinary kind commonly incidental to a building, &c.

In the opinion of this Council, who are well informed as to the practical non-existence of such arts and crafts and others in Ireland, an exhibition which would not be educational comparative of Irish work with its rivals, and with a special end to revive lost crafts and introduce new ones into Ireland (among which there are some definitely suited to female employment), would be futile and even mischievous.

Resolved—That while sympathising with the Earl of Mayo's patriotic scheme of an arts and crafts exhibition, the Council of the Institute of Architects shall await the definition of a scheme on comprehensive lines and of practical management, under which mere manufacturing advertisement may be discriminated from genuine art craftsmanship.

When assured of practical advantage to arts and crafts, with architecture and building, the Council would desire their President to represent architects in co-operating in such a movement.

ST. ANDREW'S CHURCH, NEWCASTLE.

At the last monthly meeting of the Newcastle Society of Antiquaries Mr. S. Thorpe said he wished to call attention to the alterations at St. Andrew's Church, Newcastle. It appeared in opening out the Holy Trinity chantry they had come upon the tomb of Sir Aymer de Athol. He had heard that it was proposed to lower the floor of the chantry to the level of the floor of the church. Now the church floor was already about a foot higher than it was originally, and if they were now to lower the floor he thought it would spoil the effect altogether, and besides, it would disturb the tombstones that were now laid. It would be a pity to do so. It was also suggested that a layer of concrete should be laid over the whole.

The Secretary thought some of the gravestones found were most interesting.

The Chairman asked if Mr. Thorpe had any authority for the statement he had made.

Mr. Thorpe said they were carrying away earth from the place now. Perhaps the Chairman could give them some information.

The Chairman said he knew nothing about the affair—nothing more than he had seen in the newspapers.

Mr. Knowles said the excavations revealed several tombstones, including that of Sir Aymer de Athol. If no other member of the Society was interested in the matter, he would be very glad to measure and indicate the position of the stones and to record the inscriptions. He had simply glanced at the articles in the *Newcastle Chronicle* that morning, and he gathered that they had fallen into the usual mistake that St. Andrew's was the oldest church in Newcastle. This was not correct, for at St. Nicholas's and St. John's they found the oldest foundations. The only portion of the brass taken from the tomb of Sir Aymer de Athol was now in the Black Gate. It would, perhaps, be well to record all that was to be seen in the chantry of St. Andrew's, and, if no other member was concerned in the matter, he would be glad to do what he could. He would see the architect of the alterations, and if he was not going to make the record, he (Mr. Knowles) would be glad to do so. The tomb found there was, no doubt, contemporary with the work of the fourteenth century.

The Chairman thought the offer of Mr. Knowles was a valuable one, and one which they should accept. In regard to what Mr. Thorpe had said about moving the stones or covering some of them up again, he thought they should really gather some information with reference to that.

Mr. Knowles thought that was a mistake on the part of Mr. Thorpe. There was no vandalism, he imagined, contemplated.

Mr. Thorpe said he had heard it was suggested to cover them with cement.

Mr. Wm. Vincent, one of the churchwardens of St. Andrew's, said that Mr. Thorpe had been misinformed. He might say for himself, for the vicar and his fellow-churchwardens, that their wish was to have everything of antiquarian interest most carefully protected, and in any way they could they would take the greatest possible care that no injury was done to anything that was found. They had made special arrangements with Mr. Hicks, architect, to the effect that everything of antiquarian interest should be taken the greatest care of. So far as the contract was concerned, if they happened to come across anything that would indicate any of the old building, and possibly the lost chantry, which they thought might stand upon the present vestry, it was decided that the contract might be altered so that they might pay for any differences in work. So far as the De Athol tombstone was concerned, he might say it had been suggested by one of the churchwardens, Dr. Arnison, that a cast should be taken, which the churchwardens

might either take care of themselves or give to the Society of Antiquaries, though he did not promise the latter. They wished to have the tombstone so protected that they might know where it was. They might depend that every care would be taken in the work. Mr. Thorpe had made some reference to lowering the floor. They did not expect, in lowering the floor of the chantry to the level of the floor of the chancel, that they would do any injury to anything. Indeed, they had such an able architect to direct their operations that they might be sure nothing would be done to do any harm. Speaking for himself, he had a great deal to do with what was going on, and if Mr. Knowles cared to co-operate with him he would be glad to assist him as far as possible.

GENERAL.

Messrs. Woodhouse & Willoughby have been successful in the competition for the Castlemere School for the Rochdale School Board, which will cost 5,000*l*.

A Church of the fifth or sixth century, 120 feet in length, has been discovered in the course of excavations at Tigzait, near Dellys, Algeria. There are numerous carvings on the walls, and in the apse are many Pagan stelæ, apparently showing that a temple originally stood on the site. The monogram of Christ is profusely employed on the carved pillars.

An Inquest has been held at Kensington upon the remains of Mr. W. Conradi, an architect, aged sixty-four. It appeared that he was engaged measuring the interior of Watford Church, and, slipping from a pew, fell to the ground. Mr. Conradi succumbed to shock from internal hæmorrhage from injuries sustained through the fall. A verdict of "Accidental death" was returned.

The Dean and Chapter of Peterborough Cathedral have given instructions to Mr. Pearson, R.A., to proceed with designs for a memorial to Queen Catharine of Aragon, to be placed in the cathedral. The Dean and Chapter have also decided to erect there a memorial to Mary, Queen of Scots, her body having for a short time lain in the cathedral.

An Ogham Stone, inscribed with novel characters, has been found in Deracrin, co. Louth. Hitherto memorials of that class were only found in the southern districts of Ireland.

The City Commission of Sewers decided on Tuesday that Mr. D. J. Ross, who since 1882 had been chief assistant to the late engineer (Colonel Haywood) and twenty-two years in the department, should be appointed chief of the engineer's office, with power to call in consulting advice under the authority of the court when deemed expedient, and that his salary, now 650*l*., be increased to 900*l*.

Alderman Gibson, Newcastle, has given 3,000*l*. towards the erection of a building at Gosforth, to accommodate the beneficiaries of the Diocesan Home of Mercy. The building and site will cost over 8,000*l*.

Turner's "Ancient Italy" has been purchased by some French amateurs and presented to the Louvre. It is an important addition to the few works which represent English art in the galleries.

The Merchant Taylors' Company have let on a building lease, for the purpose of being pulled down, the exquisite vaulted early fourteenth-century undercroft at No. 3 Laurence Pountney Hill, the only known specimen of that kind of domestic architecture now remaining in London.

A Statue of the late Cardinal Lavigerie is to be placed in the public place of Bayonne, his native city. The initiative of the project is to be credited to M. Bonnat, the portrait-painter.

The Honorary Degree of D.C.L. is to be conferred by the University of Oxford on Mr. John Henry Middleton, M.A., Exeter College, Fellow of King's College, Cambridge, director of the South Kensington Museum, Slade Professor of Fine Art in the University of Cambridge; and Signor Rodolfo Lanciani, professor of Roman Topography in the University of Rome.

An Exhibition of ancient and modern industrial art will be held in Copenhagen from July 15 to September 30.

Mr. T. de Courcy Meade was on Wednesday elected city surveyor of Manchester.

Messrs. Paley, Austin & Paley have prepared plans for the restoration of Farnworth Church, and a faculty has been granted for carrying out the work, which it is estimated will cost between 3,000*l*. and 4,000*l*.

A School of Art and free library is proposed to be built at Brierley Hill, and a committee has been appointed to consider the subject.

The Annual Excursion of the Lincolnshire and Nottinghamshire Architectural Society took place on Wednesday, when the churches of Ashby Puerorum, Somersby, Salmonby, Tetford, Ormsby, Harrington, Bag Enderby, Hagworthingham, Lusby, Bolingbroke, Mareham-on-the-Hill and Scrivelsby were visited.

The Architect.

THE WEEK.

By the accidental death of Mr. ARTHUR CAWSTON, in his thirty-seventh year, on Friday last, an architect who appeared to have a most prosperous career before him has been lost to the profession. He was a man who was endowed with peculiar energy, and having moreover the advantage of influential friends, his success might be considered as assured. His project to improve London by the formation of boulevards and other costly works was characteristic of his ambitious temperament. Mr. CAWSTON's own works did not err by extravagance, for they were all kept within due bounds. The new Home for Incurables on Streatham Common, which is ready for opening, was an example of his competence to erect large buildings. Another important work is the market at Carlisle, which he carried out in connection with Mr. GRAHAM of that city. Mr. CAWSTON was architect of the Church of the Ascension, Balham, with the vicarage; the church of St. Luke, Bromley Common, and St. Philip's Church, Stepney. He also designed houses at Bromley, a mansion at Marden Park, and a mansion and farm buildings at Paddockhurst, Sussex.

In the course of the Rede Lecture, delivered in Cambridge on Wednesday, Mr. J. W. CLARK, M.A., described the arrangements of Mediæval libraries. The books were generally kept in the cloisters and were shut up in presses. The Durham Rites spoke only of book-presses standing in the cloisters against the walls; but it was not unusual to have recesses in the wall itself, fitted with shelves, and probably closed by a door. Afterwards a definite room was constructed for books, in addition to the presses in the cloister, which were still retained for the books in daily use. This library was not unfrequently thrown open to scholars in general, who were allowed to borrow books from it, on execution of an indenture or deposit of a sufficient pledge. When books were first placed in a separate room, fastened with iron chains, for the use of the fellows of a college or the monks of a convent, the piece of furniture used was probably an elongated lectern or desk of a convenient height for a seated reader to use. The books lay on their sides on the desk, and were attached by chains to a horizontal bar above it. There were at least two libraries in Cambridge University fitted with such desks—at the colleges of Pembroke and Queen's, and that it was a common form abroad was proved by its appearance towards the end of the fifteenth century in a French translation of the first book of the "Consolations of Philosophy" of BOETHIUS. The desk could not be dispensed with so long as books were chained, but one or more shelves were added to it. The system of chaining, as adopted in this country, would allow of the books being readily taken down from the shelves and laid on the desk for reading. One end of the chain was attached to the middle of the upper edge of the right-hand board; the other to a ring which played on a bar set in front of the shelf on which the book stood. The fore-edge of the books, not the back, was turned forwards. A swivel, usually in the middle of the chain, prevented tangling. The chains varied in length according to the distance of the shelf from the desk. The bar was kept in place by a rather elaborate system of ironwork attached to the end of the book-case. In English libraries at least bookcases arranged on what he might term the Oxford type were in general use throughout the sixteenth and seventeenth centuries. The invention of printing had largely increased the number of volumes, and at the same time diminished their value, so that chaining was no longer necessary. When it had been abandoned neither a desk nor a seat in close proximity to the books was required. In consequence, though libraries continued to be built on the ancient type with numerous windows close to the floor, it was possible to alter the old cases or to make new ones with a far larger number of shelves than heretofore, and when further space for books was needed low cases were interposed between each pair of tall ones. So far as Mr. CLARK

had been able to discover, the first library arranged in the way with which we were familiar—namely, with the bookcases set against the walls instead of at right angles to them—was that of the Escorial. Among the imitators of this, he felt sure, was Cardinal MAZARIN, whose library was fitted up in Paris shortly after 1643 in order to be used daily by the public.

An important improvement will shortly be undertaken in Sheffield. The High Street is to be widened at a cost of 260,000*l.*, and the money could not be more wisely expended, for as a thoroughfare it is not worthy of the new city. There are eighteen owners of property, and already the City Council have been able to arrange with sixteen of them. That means securing 2,556 square yards. Possession of five of the properties can be obtained at once. The leases of the remainder will expire between the present time and 1897. The Corporation are prepared to consider offers to surrender at an earlier date. The properties have been acquired for sums which are below the valuer's estimates.

THE people in the North have a certainty that they will not be overcharged when the "measuring up" is conducted by one of the regular measurers. It was therefore a waste of money when a plumber's bill for 79*l.* was disputed in the Glasgow Sheriff's Court on account of inaccuracy. The work was done in connection with alterations of property at Dowanhill; it was measured by Mr. WILKIE, who had prepared the schedules of quantities, and certified by Mr. TENNANT, the owner's architect. But the owner declared that the measurement was essentially erroneous and misleading; that the quantities were taken from the statements of the plumber, and were not verified; that in many instances they were in excess of the work actually done and of the material supplied; that the prices allowed were excessive, and that in almost every item, which was not expressly provided for in the estimate schedule, the prices were very much overcharged, and not in conformity with the condition of the schedule, wherein it was stipulated that the work should be "charged at the estimate rates or others corresponding thereto;" and further, that in some instances the materials supplied were not correctly described in the measurement, and charges were made which were excessive and inapplicable to the materials actually supplied. After an investigation the defence was set aside, and a decree has been given for the amount sought. That is satisfactory for the plumber. But is there to be no compensation for Mr. WILKIE, against whose professional character so many unwarranted allegations have been made in a public court?

THE committee of judges appointed for that purpose have on various occasions thoroughly considered the drawings submitted by the architects who were requested to send in competitive designs for Christ's Hospital new boarding schools, and they have now reported to the Council of Almoners that in their opinion each of the designs is of exceptional merit and power. They are unanimously of opinion that the design submitted by Messrs. ASTON WEBB & E. INGRESS BELL most closely fulfils the instructions; that it is the best in point of arrangement, the cheapest to carry out, and is on the whole the most suited for the Hospital's purpose. They have accordingly made their award in favour of Messrs. ASTON WEBB & E. INGRESS BELL.

THE opening address of the meeting of the British Association at Oxford will be delivered by the Marquis of SALISBURY on August 8, in the Sheldonian Theatre, which will be specially lighted by electricity. There will be excursions to Windsor Castle, Dropmore, Taplow Court, Silchester, Reading, Blenheim, Swindon Railway Works, Faringdon, Abingdon, Dorchester, Wallingford, Warwick Castle, Stratford-on-Avon, Wroxton Abbey, Broughton Castle, Edgehill, Compton Wydmattes, Tanford, and probably to other places in addition. Lord WANTAGE, Sir WILLIAM ANSON and other gentlemen will give garden-parties during the meeting.

THE STAIRCASE.

THE ancient tradition about JACOB'S Ladder suggests the simplicity of the primitive means of ascent and descent in buildings. We may assume that one of the difficulties which checked the desire to erect lofty buildings arose from the inability to reach the upper parts. LONGFELLOW, in one of his poems, endeavours to inspire courage in the faint-hearted by pointing out that the giant pyramids of stone, when better known, are found to be only flights of stairs. Although the description is true enough, yet it must be acknowledged that the risers and treads are excessively inconvenient. We might suppose that pyramids were originally suggested by a ladder placed against a house, but of the two means of access the majority of climbers would prefer ladders. Apparently the most approved system of approach for lofty structures in the East was to surround them by an incline. When the decorative value of a great number of steps to form a base for a building was perceived, the inconvenience arising from each being formed of deep stones obtained little attention. The Greeks were not more considerate than other people in the arrangement of steps for the temples.

As even in Babylon the houses consisted of several storeys, there must have been some means of approach from one to the other, but about the character of the stairways we know nothing. They were likely to be very simple. From the absence of information on the subject in the ten books of VITRUVIUS, it might be assumed that fixed staircases did not exist, and that the wise arrangement of ROBINSON CRUSOE of employing a ladder which could be drawn up out of reach was anticipated by the occupants of Greek and Roman houses. VITRUVIUS was, however, somewhat supercilious, and as he appeared to despise a great many things in buildings which could only claim to be useful, probably the staircase was among them. In the Pompeian buildings the important rooms were on the ground floor and visitors never reached a higher level. There were rooms in Pompeian villas which were more uncomfortable than the attics in modern seaside lodgings, and it was of little consequence how they were reached. There is a close connection between architecture and display, and as long as receptions were confined to rooms which could be directly approached from the streets or roads, the staircase was likely to be severely simple in character.

In the early Mediæval period it was necessary to give more thought to security than to architectural appearance. Hence it was that so many staircases were arranged around newels. Their construction is evidence of remarkable skill in the builders which could be easily turned to account in a more imposing way, but the corkscrew stairs compelled an enemy to approach in almost single file, while defence was facilitated. It was probably a desire for security that originated external staircases, which, as the German term *Treppenhaus* still suggests, were considered as independent buildings, although it may now be applied to the interior cage containing stairs.

The Renaissance introduced a more festive character in ordinary life, and in no part of a building was the change more evident than in the arrangement of the staircase. But that change could not be accomplished if war had not also submitted to modifications which diminished the chances of attacks on unfortified buildings. If the Scala dei Giganti in Venice was not the first example of a grandiose treatment, it is likely to have been the earliest which suggested what was attainable to people in other parts of Europe. Venice was the centre of trade where men from distant countries congregated. A modern merchant would concentrate his thoughts on business, but in an earlier time he was expected to do more. NICHOLAS BRETON tells us that the worthy merchant of the Elizabethan period "out of his travels he makes his discoveries, and from his eye-observations brings the models of architectures." The great change which took place in the planning of English staircases will be found to correspond with the extension of English trade by the Merchant Venturers of that period. There was an abundance of timber available, and skilful carpenters to make use of it. Accordingly we find not only construction that has resisted time, but carving that is often carried to excess. The staircase became fascinating

for craftsmen, and on it they exercised such imagination as they possessed. The old hall had been superseded, but the staircase took its place to some extent, for the walls could be lined with ancestral armour and arms; there were also opportunities given for the introduction of heraldic figures and other devices. The staircase also united the galleries, which were an extension of it, and further compensated for the loss of the hall.

Great staircases could not have gained favour in England unless they were adapted to the requirements of life. Like wide entrance-doors, they were suggestive of hospitality. Nothing can seem more out of place in the house of a miserly or a lonely man than wide stairs, for imagination at once pictures them as crowded with a joyous company, and the contrast of their deserted state becomes painful. For a similar reason it is absurd to construct a magnificent staircase to lead to rooms that are insignificant.

As we said before, the staircase is adapted for display, which means of course that arrangements should be made for seeing the people who pass along it. In provision of that kind there is no modern example which is better planned than M. GARNIER'S in the Paris Opera House. The *cage* seems almost like a second theatre, of which the stage or ring is the staircase. Galleries rise above galleries, as if every spectator was entitled to enjoy a second spectacle, which for many becomes the more attractive. The ample space, the graceful curves, the capacious landings seem prepared for a dignified procession of men and women who are expected to allow themselves to be seen. A ticket-holder who is late and hurries along that staircase always appears to be out of place. It is not often that a modern architect can expect to have the construction of so costly a work, and some of the evils of Imperialism should be condoned on account of the liberality which allowed its creation.

It is evident that M. GARNIER avoided straight lines unless where they were indispensable or were useful for contrast. In other staircases in Paris the same love for curves is manifest. The French architects, from their acquaintance with geometry, find pleasure in devising problems which would be puzzling to many "staircase hands" in this country whose winders are rather limited. The esteem for curved lines is not, however, modern, for the remarkable horseshoe steps in the Cour du Cheval-Blanc at Fontainebleau date from 1634.

In England we have grown accustomed to timber staircases, and the raking lines of strings and bearers do not appear incongruous even when they are introduced with masonry. Iron or steel girders, accordingly, are considered to be allowable if they are concealed. But, as everybody knows, there is a limit to the employment of stone in lintels; a similar limit should be observed when the lines are not horizontal. Arches or semi-arches, therefore, are the most appropriate supports for flights of stairs which are constructed of stone. They also suggest how the weight of a staircase is carried, which is not always evident.

ANTONIO CANOVA.

THE influence of fashion in sculpture as in the other arts is remarkably exemplified in the uncertainty which appears to inspire criticisms on CANOVA. He was supposed to have given the death-stroke with his chisel to the extravagance of the school of BERNINI. For that he was considered to deserve the gratitude of all lovers of art. Many of his works have so much grace they might pass for antiques, and if they were put forward as examples of Greek art of a late period they would receive unbounded admiration. But there are connoisseurs who consider CANOVA to have been a man of limited powers, who had the good fortune to appear at a time when his unaffected simple style was a novelty and who gained more success than was his due. His figures are also believed to be more dangerous than those of the BERNINI school, since it is not so difficult to imitate them. In consequence they are supposed to have been the cause of that deluge of characterless things in marble which has overspread Europe, and made "modern Italian" serve as a byword for frivolities that are better adapted to be formed of sugar than of stone.

Criticism of the latter kind is exaggerated. CANOVA is not to be blamed for the errors of hosts of imitators, or of those men who turned his simplicity into silliness. Then again, an artist should be judged by the canons which apply to his special class of work. CANOVA never aimed at exciting terror or any of the painful emotions. There was in him as little of a MICHEL ANGELO as a BERNINI. A kindly man, he was glad to be enabled to please the world, and as he knew that few people were able to appreciate the sublime while everyone could enjoy the sight of graceful forms, he kept to the latter. He produced Hebes, Terpsichores, Graces and Heroes that are more mortal than divine.

If compared with ancient figures bearing similar titles, CANOVA's will be considered as less expressive. He was no deep student of mythology, and it may have been an error to have applied names to his figures that would recall Olympus. We must remember, however, that in Italy a long series of traditions and legends had imparted a sort of familiarity to those beings, and it was the notion of an Italian peasant which CANOVA expressed when he modelled a goddess, rather than those of a modern scholar who believes there are profundities in all things mythological. CANOVA's countrymen could have no difficulty in interpreting the character of his *Venus* who appears surprised when bathing, or his *Venus* who is a suppliant to Adonis. They were as significant as the Pauline Bonaparte type, which was known to be a portrait although called a *Venus Victrix*. When against his will CANOVA's *Perseus* was set up on the pedestal in the Vatican where the *Apollo Belvedere* used to stand, the Italians were delighted. The modern figure seemed to be more of "a swell," and the languor corresponded with that of the fine gentlemen in uniform who were visible on grand occasions in the palace. There is little use in judging CANOVA's figures by antique standards; they will not sustain that test: but if we accept them as Italians of the close of the eighteenth century, in scanty drapery, they become characteristic of time and place. A sculptor has to think more of his patrons than of posterity, and when we know how the old King FERDINAND of Naples insisted on CANOVA's representing him as MINERVA, we are able to realise how lax were the notions of fitness at that time.

The sculptor was not only an Italian by birth, disposition and genius, but he was an example that the old methods of acquiring artistic power in his country were as effective in the eighteenth century as in the fifteenth. He was born at Possagno, in the province of Trevisa. The village is surrounded by marble quarries, and his family, like most of the inhabitants, were quarrymen or masons. It is still a primitive place where old customs prevail. The church, which CANOVA erected, on every festival exemplifies one of them, for the women alone are allowed to enter through the principal door. ANTONIO, in common with the rest of the boys, used chips of marble as playthings, and as soon as his hand had the strength to use a tool he was apprenticed to one of the stoneworkers, TORRETTO, who could build a wall, carve a panel or a statue without any thought of the difference between trade and art. In the church of S. Liberale at Castelfranco there is an *Assumption* by him, and according to tradition the little tower which is his mason's mark was the work of his apprentice. He was a severe master, who insisted on CANOVA's industry, especially when it was found the apprentice was possessed of ability. TORRETTO's rigour is seen in one incident. ANTONIO fell in love with a girl, BETTA BIASI, whose beauty captivated him. A marriage was agreed upon. At that time TORRETTO fancied he would be more successful if he emigrated to Venice, and his apprentices were obliged to accompany him. CANOVA awakened from his first dream of love, and he was no less unfortunate on another occasion.

When his apprenticeship was over there was nothing to call him back to Possagno. His father was dead, his mother had taken another husband, and CANOVA, from her example, may have thought that all women were fickle, and that BETTA was not worth seeking. He remained in Venice and devoted all his thoughts to his art. His patron was the senator FALIERO, who ordered a carving of two baskets of fruit and flowers which were to ornament a staircase. The commission was not important, except as a trial piece. The baskets were successful and, as in an

earlier time, it was assumed that whoever could carve fruit and flowers was competent to produce full-size Classic figures, and a commission was given by FALIERO for an *Orpheus* and an *Eurydice*. They were followed by a group of *Dædalus* and *Icarus*.

It is well to remember that CANOVA had received a training which would not now be considered as more than sufficient to qualify him to be a carver of ornament or a monumental mason. Although he was in Venice he might be considered as being without opportunity to look upon examples of the antique. Fortunately for him, at that time the Venetians had decided to send a new ambassador to Rome. ZULIANO, who was selected, was a friend of FALIERO. The senator, being anxious to cultivate the taste of his protégé, sent CANOVA to Rome with recommendations to the ambassador, and a cast of the *Dædalus* and *Icarus* was also despatched. It is related that the sculptor, a few hours after his arrival, went to the French Academy to draw from the living model. Soon afterwards the cast was exhibited by ZULIANO to a group of artists and amateurs. The treatment was so different from what was common, the group was not admired. GAVIN HAMILTON, the English painter, was however present, and he became its expositor. The originality and simplicity were then admitted, and CANOVA's position was secured. As long as he lived he continued to express his gratitude for the protection which HAMILTON gave at the most critical point in his life. We must not forget that at the time CANOVA was only twenty-two, and might be considered as a rustic who was out of place in a fashionable assembly. He returned to Venice with more confidence than he had when leaving. He was able to have an allowance of 300 ducats, and with that aid he returned to Rome, resolved to educate himself by means of the examples of Greek art.

The ambassador had presented him with a block of marble, and he decided to employ it for a group, *Theseus, the Conqueror of the Minotaur*. It is said that for this work he drew inspiration from the antique monochrome in the Naples Museum, and CANOVA was never ashamed to acknowledge indebtedness of that sort. When the group was finished it was purchased for a public place in Milan; afterwards it became one of the spoils of war, and was carried to Vienna. QUATREMÈRE DE QUINCY was in Rome, and he expressed surprise that such a work could have come from a young unknown artist, for the execution seemed that of a practised hand. Still more remarkable, he considered, was the antique spirit which seemed to impart life to the figure. The admiration may now seem unwarranted, but the critic had been surrounded by so many commonplace or exaggerated attempts, he could not contain his satisfaction on seeing a marble group in which nature was not outraged. CANOVA's *Theseus* might not be godlike, for the figure suggests a combatant who is not far from being exhausted by the brutal strength of the son of PASIPHÆ; but to express an effect of that kind was a great effort for the time. Out of gratitude the sculptor offered the group to ZULIANO, but it would not be accepted. Afterwards he executed a companion work, showing the hero seated on the monster, which corresponds with the subject of an ancient cameo.

The success of CANOVA was assured, for his figures were considered by the connoisseurs to rival those of the Greeks. It was also accepted as inevitable that he must be equally competent to produce all classes of work. His *Hebe*, which is universally known by the casts from it, is not separated by any great distance of time from GANGANELLI's monument in the Church of the Apostles or from the kneeling figure of the aged CLEMENT XIII. (REZZONICO of Venice) in St. Peter's. Busts and colossal groups, Christian and mythological subjects, equestrian figures, and monuments for churches were produced by CANOVA with equal ease. It was only when he occasionally attempted to treat a subject like the *Hercules and Lycas* (which was compared to a quilted mattress), that his contemporaries perceived there was a limit to versatility. Apologists could be found when weakness was exhibited in some other works. Thus, the figures forming part of the monument of the STUARTS in St. Peter's, which are weak enough, are supposed to be more fitting symbols of the enervation of the later representatives of the race than any which a second MICHEL ANGELO could have produced. CANOVA would have been more than

human if so large a quantity of works as he produced were faultless. He could claim credit for fifty-three statues, twelve groups, fourteen cenotaphs, eight monuments on a large scale, seven colossal figures, two colossal groups, fifty-four busts and twenty-six bas-reliefs. A Greek or a Renaissance sculptor would declare that a pair of hands could not operate on so much marble, but, of course, CANOVA could utilise mechanical aids which were unknown at an earlier period.

CANOVA does not appear to have considered the quantity or the quality of his work as remarkable. Throughout his life he seemed to remain the peasant of Possagno whose business in life was to work in stone. He felt no more jealousy towards successful contemporaries nor superiority over inferior men than would exist between ordinary masons in his native district. The world he thought was wide enough and marble sufficiently abundant to afford employment for more sculptors than existed. There never was an artist who was more disposed to praise the works of other men. On one occasion he said, "If the works of ALVAREZ had been in my studio they would not have remained unsold," thus placing a rival on the same level as himself. He set up a tablet in the Church of the Apostles in Rome to record his obligations to the Venetian senator FALIERO, as if without that benefactor's aid he must have remained in lifelong obscurity. He declined a commission for a statue of the Emperor ALEXANDER, in order that he might devote his time to the cenotaph which was to be a memorial of his admiration for VOLPATO, the engraver. The busts of the Italian artists of the sixteenth century forming part of the Protomoteca in the Palace of the Conservators were either executed gratuitously by him or obtained at his cost. When he was granted the Marquisate of ISCHIA, with an income of over 600*l.* a year attached to it, he divided the whole of the money between three of the academies; he founded also studentships in architecture, sculpture and painting, and pensions for needy artists in Rome. Remembering that his first commissions were FALIERO'S for an *Orpheus* and an *Eurydice*, he devised a crest to record that fact, for it was made up of a lyre and a serpent combined. But he never signed his name as a noble; he remained to the end plain "ANTONIO CANOVA."

It was natural that artists should have held him in reverence, and that when he started a church in Possagno, the inhabitants, including women and children, endeavoured to co-operate with him in the works. Nor was the affection for him confined to Italy. One-fourth of the 4,000*l.* required to pay for CANOVA'S monument in Venice was contributed from England, and a similar amount was given by Frenchmen and Germans, who forgot their country on that occasion. The inscription, "ex consolatione Europæ universe," is insufficient, for some subscriptions arrived from South America, thus proving that the sculptor's merits were not unknown in that region.

A still more striking proof of the fascination which CANOVA'S work exercised on all is seen in his relations with the French ruler. BONAPARTE, although he avoided Italy, had dreams about improving the condition of the country to which his family belonged. But he could not, he said, discover capable men. CANOVA could not say he was neglected, because he was neither politician nor soldier. BONAPARTE, when consul, invited the sculptor to Paris and offered him 120,000 francs for a portrait statue. CANOVA accepted the commission, and in due time produced the large nude figure which is now in Apsley House. It shocked BONAPARTE, especially as he imagined that CANOVA was as unable to understand facts as the rest of the Italians, and must have supposed that the victories which amazed Europe corresponded with those of the English prize ring; or, as BONAPARTE expressed it, "CANOVA croit donc que je me bats à coups du poing." But more acquaintance with the sculptor's style would have diminished the surprise. CANOVA from the first had been making antique heroes of his countrymen; for one who had become so remarkable he could not think of a more suitable representation. His figure of BONAPARTE'S sister is a *Venus Victrix*, his portrait of "Madame Mère," the mother of the conqueror, is an imitation of the *Elder Agrippina*, he represented MARIA LOUISA as *Concord* holding a sacrificial cup. CANOVA would not flatter, and when he said that BONAPARTE'S head was of such a character that it

could easily be taken for an antique if represented on a gem, we may be sure that was his conviction. He imagined he was only properly eulogising the warrior when he presented his figure undraped, just as a scholar might consider that Latin or Greek would alone be eligible for the record of his deeds. Although he was disappointed, NAPOLEON when Emperor wished to retain CANOVA in Paris, but the artist was too much of an Italian to care for a strange land. He believed the world contained no cities that were comparable with Rome and Venice. It was to the Academy of Venice he bequeathed his hand and chisel, and to the Church dei Frari his heart.

The relations of CANOVA with the French Emperor brought about one of the most disagreeable incidents of the sculptor's life, but one in which we can trace his desire to judge affairs in a generous way. On the downfall of the Empire he was selected to become a sort of temporary ambassador in order to recover the works of art which were taken from the Roman States. He declined the mission, but as the Pope insisted, he was forced to yield. He endeavoured to carry out his duties without offering much offence to the French, but he was not successful. His concessions to France were likewise unsatisfactory to the Romans, and between all the parties he was made to suffer. It was a relief to him to accept the invitation of the Prince Regent and visit England. He saw much which surprised him, and especially the Elgin Marbles. They were a revelation to him, for he said that no casts, drawings or engravings which he had seen could suggest the beauty of the originals and the absence of hardness, affectations and convention exhibited in them. His admiration produced much effect in England, and was not without its weight in the transactions for the purchase of the sculpture.

THE AMERICAN ARCHITECT OF FASHION.

IN an article on "The Architect of Fashion," published in the *Architectural Record*, Mr. Leopold Eidlitz has the following remarks on one of the latest developments of the profession in the States:—

The architect of fashion is he who aspires to be the fashionable architect. Like the modern politician, the architect of fashion has no convictions, but follows adroitly in the wake of public opinion. His aim is not to be a great architect, but to do a big architectural business, and in this he very often succeeds. Practice with him has in time developed even a positive dislike for architecture in the abstract, for whenever he has attempted it in any degree the result was disastrous from a business point of view.

To do justice to the architect of fashion, let us say here that he was not born so, nor is he conscientiously malicious or even cynical. He is shrewd enough to look after his material interests, and when he finds these inconsistent with the interests of architecture he drops architecture, rather than let architecture drop him. Of course he has abandoned all claim to immortality, to a statue in the Walhalla or a niche in Westminster Abbey, but he enjoys life while it lasts as a highly respectable member of society belonging to the most fashionable clubs, and although at times he gets very tired of it all, because of the humiliation of constant drumming and the silent gnawing of his professional conscience, he has the consolation of success and feels sure of pre-eminence until supplanted by an architect even more eminently fashionable.

To understand him thoroughly, we must permit him to speak for himself:—

"Your talk of architecture as a living art is most delightful, and reminds me of Kugler, Lubke and Viollet-le-Duc and old Ungewitter; but it is not practical. Everybody admires it, but nobody wants it. My interpretation of architecture as a living art is an art by which an architect can live. When I was young and enthusiastic and all that sort of thing, I procured with much labour an introduction to A. X., the great life-insurance president, a dignified old gentleman, who received me in his office after waiting an hour and a half in an outer room. He listened to me over his shoulder while I stood behind his big arm-chair, as he had not offered me a seat, and I repeated with much trepidation a well-considered brief lecture on architecture.

"When I had finished there was a pause of a minute or two, during which he read over twice an open letter he held in his hand; then he turned, with an evident effort to be amiable as far as his rooted dignity would permit, and said:—'Young man, my friend in this letter speaks of you in very high terms as a promising young architect. I dare say you talked art to him as you did just now to me. It sounds well, and is apt to

impose on persons less familiar with the subject than I am. Architecture, my dear fellow, is not a living art. Greek architecture died before Christ, and Gothic architecture before the Reformation, and that is the reason why we need architects well versed in art history to design our buildings. If, as you say, it were a living art, then anyone could do it. Good-morning, sir."

"Now that I am older I know better. I never talk architecture to my clients. When a man is engaged in building a house or a store or a bank, his mind is naturally preoccupied. He doesn't want to be bored with architecture. Besides, between you and me, of what earthly use is architecture to an architect? Let me tell you it is a hindrance to success. What a man of business wants to know is that you can do the thing you undertake to do well and promptly, and the only way to convince him of that is to tell him so. For instance. After listening attentively to the wants of my client I say modestly, 'I believe, sir, that I now have your views regarding the building, yet I cannot be quite sure of that. You have matured the matter in your own mind. To me many of the features are quite new though intensely interesting. I must ask you to grant me another interview, perhaps two or three after I have commenced plotting it out on paper. When I have fully mastered the subject as you have, then the work will go on rapidly. I do not expect to succeed with a first sketch nor a second nor a third or perhaps a tenth. I throw them off at the rate of two or three in a day, and reject all until I am satisfied. When once satisfied, however, I am sure you will have a design as near perfect as the human mind can produce. I then put from ten to twenty draughtsmen and two or three clerks upon it at once, and in two weeks from now we can proceed with the building. I need only six months to build it in. I can do it in five if need be. A client of mine said to a mutual friend of ours, 'What I like in him is his promptness. He knows what he is about, and he tells you at once what he can do and what he can't do.'"

As to style, the architect of fashion continues:—"It is wisdom to confine yourself to the vernacular. It is the only idiom which is popularly understood; not exactly understood, but, I should say, tolerated by public opinion. Ever since the beginning of the sixteenth century, say nearly during the last four hundred years, the bulk of the architecture of the civilised world has been Renaissance in style. When men feed upon a steady diet physically or mentally for twelve successive generations the race acquires a taste for it. Not because it has analysed its hygienic or intellectual properties, and has found them adapted to its physical or mental needs, but because the digestive apparatus has become incapable of assimilating other matters. Of course, you will tell me all about the revival of Mediæval architecture during the last half-century. You will point to the great achievements of Scott and Street, of Schmidt and Hansen, of Viollet-le-Duc and Gaertner and many others. You will speak of the restoration of the cathedrals, of Munich, the modern Romanesque city, of the Gothic work done in London and Vienna, and even in America, but I will tell you that during all this last half-century the bulk of the architectural work done, say nine-tenths of it or more, has been Renaissance. The pioneers of the revival of Mediæval art are passing away one after another, and there are no successors to fill their places mainly because the movement has not been a popular success. As for myself, I prefer to rely upon the great majority for a supply of clients, and, as clients go, they pay well, and are not exacting, provided you humour their notions and recognise their good taste, and that is only human nature after all."

Thus speaks the architect of fashion, and thus he acts. It is desirable to know what becomes of architecture under his management, and incidentally how it affects the architect. To dispose of the latter first in as few words as possible, it seems clear that the architect is rapidly descending from his high professional position and ranging himself with that class of mercantile enterprise which, having no confidence in intrinsic merit and real usefulness to society, seeks recognition by drumming and advertising. The lawyer, physician, clergyman, engineer—yes, even the mason, carpenter and horseshoer—claim to have acquired a knowledge of the theory and practice of their respective vocations which is not shared by the public, and tacitly deny the right of their clients to decide upon the methods and means to be used in carrying out the work entrusted to them.

The architect of fashion defines his position somewhat as follows:—"Architecture," he says, "is a science as far as it relates to mere building, and an art in clothing the building in certain forms. The latter is a matter of taste, and the architect being an artist is presumably possessed of a large share of this taste, but inasmuch as the forms of architectural monuments are determined for us by architects of past periods, and cannot now be changed, and as furthermore our clients have a preference for certain architectural styles, it is but reasonable to admit public taste as co-ordinate with that of the architect."

There are those who assert that there is a logical relation between construction and the development of form, which is

not a mere matter of taste or convention, but one of scientific demonstration. But the moment the architect of fashion admits this argument he practically denies his client's influence in the premises, and risks the loss of his patronage. By ranging on the side of the public clients are prepossessed in his favour, and the number of his competitors is reduced to those who prefer business to professional convictions.

When to the architect is given the privilege of exhibiting his work on the corners of streets, on the highways and public places of the world, he can well afford to wait for recognition of his merit without advertising or personal drumming, unless indeed he has lost faith in his own work or in the intelligence of the public.

The architect of fashion has lost faith in the intelligence of the public. "They don't like Shakespeare," he says, "so I give them variations upon 'Potter of Texas'—variations because they don't like 'Potter of Texas' pure and simple for any length of time. They want something new—some marked change; but the change again must be in the style of 'Potter of Texas.'" So last year we had the Italian Renaissance, with a decided feeling of the Colonial. What is the Colonial? Why the carpenter's interpretation of the Renaissance as expressed in wood during the seventeenth and eighteenth centuries, delicate mouldings hardly practicable in stone, decorations and carvings with just a touch of relief, for in the Colonial times much of this work was done in putty. It takes very well, for most people hate things decided either in form or colour. Still they got tired of it, so this year they longed for something vigorous, and we treat the lower storeys of our buildings with aggressive rudeness, rough stone ashlar, small openings, great iron gratings in front of them and above we continue with the Colonial Renaissance. The contrast is striking. Next year, no doubt, we will have to go in for the Rococo, the latest phase of the Renaissance in France and Germany. It is elaborate, and doubtless will take on that account. Yet some of our most fashionable architects are of opinion that the early Renaissance of the Italian school, plain walls, bulged ashlar, openings far apart, small and plain in treatment, will be the leading style. They say that Boston is already prepared for it, and if it succeeds there Chicago is sure to follow. New York, however, is more conservative. There is a strong talk here of a return to the Grecian of the Treasury Building and the Custom House (the old Merchants' Exchange in Wall Street), and if that tide sets in in time, it may save that building from being demolished. Queen Anne, it is now agreed, is dead, and past the possibility of another revival.

Bold innovations, such as piling up quarry-faced stone, grotto fashion, exaggerated by pitching off the edges so as to produce a projection from the bed of 6 or 8 inches, huge arches with immense vousoirs, and no abutment to mention, enormous entrance doors extending to the full height of the building, are striking features of no artistic merit, quickly appreciated and admired and as quickly cast aside. Thus the architect of fashion maintains a well-stocked repertory of striking architectural forms; striking, because most frequently gathered from periods of architectural decay, and also of heterogeneous building material, loud in colour and contrast and peculiar in form and texture. From these he compounds combinations which constitute the fashion of the day.

Considered from a business point of view it saves much time. Once the leading draughtsman of the office is informed of the annual change, office work takes care of itself.

The old method of spending weeks and months in designing in the seclusion of one's library is utterly impracticable with the modern business habits of the architect of fashion. Two or three hours in the morning must suffice for office work, which consists mainly in receiving prospective clients, in brief and rapid interviews with clerks of the works, in signing certificates for payments to builders and dictating a few letters generally directed to hurrying delinquent work, for the architect of fashion must maintain a high reputation for doing work promptly and rapidly. The afternoons and evenings are devoted to social intercourse with probable clients who are visited at their offices, met on 'Change, in banks and insurance buildings, and later at clubs, receptions and public meetings.

The architect of fashion is ubiquitous. His problem is to procure new orders—jobs, as he calls them—and to this he devotes all his time and energies.

Now, let us turn to architecture to see how she fares under the rule of the fashionable architect. Architecture has ceased to be an art and has become a business, a fashionable business carried on by business methods on business principles.

The chief of the business, the architect, no longer pretends to be a man of learning, of varied attainments, of a liberal education, of studious habits, retiring, modest, shrinking from contact with the world, devoted solely to his art. No, he is a man of business, a man who startles the world by his bold combinations of architectural *bric-à-brac*.

It is said of Worth, the great French artist in female garments, that he will contract to make a fine dress for a few hundred francs, but for a few thousands he will produce what

he calls a dream. The fashionable architect also deals in dreams in architectural inspirations, combinations of fancy: hence he is a genius, too, a genius *à la mode*, like Worth.

Art, in the general acceptance of the term, is the skill (technical knowledge and mechanical facility, the results of study and practice) by means of which man is enabled to create organisms or represent them in matter in imitation of nature. Fine art means the creation or representation in matter of organisms which express an idea.

Raphael's *Madonna*, Thorwaldsen's *Apostles*, Dante's "Inferno," the cathedrals of the thirteenth century, Bach's oratorios—all these are works of fine art. They express in painting, sculpture, music, poetry and architecture the Christian idea of religion. Similar instances may be cited of the various fine arts of Greece and Rome.

It is not fine art to copy any one of these works, or to combine parts of them into one whole. For instance, a series of quotations from various poets, though it may bear upon the expression of an idea and may even be a meritorious literary effort, is not a work of fine art. The same applies to architecture. To copy a building or to combine features of various buildings, no matter how meritorious the originals, is not in any sense a work of fine art.

The fashionable architect not only copies buildings as a whole, which, by the way, is not the worst of his sins, but he combines features of various buildings into what he calls a design. More than this, he decides beforehand what particular features he intends to combine for the next year or two for use in all buildings, without reference to their nature or materials. Theatres, academies, club-houses and banks are all built after these models of fashion.

For instance, during the fifteenth and early in the sixteenth century the palaces of Florence, like the Strozzi, Riccardi, Ruccellai and others, had high basements above the street level devoted to domestic offices and servants' quarters, which basements were lighted on the street with small square windows, the sills of which are from 8 to 16 feet above the floor.

Now there was a very good reason for this. The feuds and factions of families were very warm in Florence in those days, and the palaces had to be fortified against popular risings. No such necessity exists with us at the present time, yet we see many specimens of basements of the kind, of which the small windows are besides protected on the outside with heavy iron gratings.

The portico of the Greek temple consists of columns supporting an entablature and cornice, upon which rests the gable or pediment. The cornice is the covering of the structure, its protection against the weather, hence its projection. The entablature is the lintel which sustains the cornice and the superincumbent pediment between the columns. If for the colonnade we substitute a wall the entablature becomes superfluous, and the magnitude of the cornice, although accepted as proper in a temple and perhaps also in a palace, should doubtless be reduced in secular structures, both in height and in projection. We observe this to be the case not only in the earliest Roman domestic structures, but also in the basilicas. Renaissance architecture, as derived from Vitruvius and his expounders of the fifteenth century, maintains the cornice and entablature as an indivisible whole whether sustained at intervals or continuously by a wall and by columns. Moreover, this crowning feature is introduced at every storey, with a full projection of cornice, as though it were the top of the building.

The architect of fashion accepts these forms as of good authority, and adopts them in his combinations. More than this, he is swayed by motives of habit, otherwise tending in opposite directions. During what is termed the Colonial period, cornices and entablatures were made of wood, and attenuated accordingly. The subsequent invention of the zinc cornice enabled ambitious architects to indulge in exaggerated cornices at a moderate cost. The architect of fashion builds his cornices of stone, but vacillates between the meagre Colonial and the exuberant zinc in their form and magnitudes.

TESSERÆ.

Landscape Sketching.

IN the selection of a subject from nature, the student should ever keep in view the principal object which induced him to make the sketch; whether it be mountains, castles, groups of trees, cornfield, river scene or any other object, the prominence of this leading feature in the piece should be duly supported throughout; the character of the picture should be derived from it; every other object introduced should be subservient to it, and the attraction of the one should be the attraction of the whole. The union of too great a variety of parts tends to destroy, or at least to weaken, the predominance of that which ought to be the principal in the composition, and which the student, when he comes to the colouring, should be careful to

characterise by throwing upon it the strongest light. In his attention to this rule, however, the student must be particular not to fall into the opposite extreme, by suffering the leading object of his composition so fully to engross his attention as to render him neglectful of the inferior parts. Because they are not to be exalted into principals it does not follow that they are to be degraded into superfluities. All the lights in a picture should be composed of warm tints, except they fall on a glossy or reflective surface, such as laurel leaves, glazed utensils, &c., which should be cool and the lights small, to give them a sparkling appearance; but care must be taken not to introduce a cold colour in the principal light, which, as already mentioned, should be thrown upon the leading feature of a picture, as it conduces to destroy the breadth that should be preserved, while, on the contrary, the opposition or proximity of a cool to a warm colour assists greatly in giving brilliancy to the lights. If the picture, for instance, should have a cool sky, the landscape ought to be principally composed of warm tints, as contrast of this description tends to the essential improvement of the general effect. All objects which are not in character with the scenes should be most carefully avoided, as the introduction of any unnecessary object is sure to be attended with injurious consequences. This must prove the necessity of becoming thoroughly acquainted with, and obtaining a proper feeling of, the subject. The picture should be complete and perfect in the mind, before it is even traced upon the canvas. Such force and expression should be displayed as would render the effect at the first glance intelligible to the observer. Merely to paint is not enough, for where no interest is felt nothing can be more natural than that none should be conveyed. Finally, it may be observed that it is only by a due attention to each distinct part and by a skilful combination of all that the whole can be effective and delightful.

Palladio's Buildings.

Palladio's buildings in Vicenza are in general very beautiful, but most of them are in a very forlorn condition. The fronts and even the columns are of brick, the entablatures of wood; and the stucco, with which both have been covered, is peeling off, but the circumstance does not diminish the merit of the architect, though it does the magnificence of the city. Palladio's columns are mostly mere ornaments; but in contemplating his buildings, it is impossible to feel this to be a fault. The sculpture which loads the pediments of the windows is certainly ill-placed; and still worse is the little panel of bas-relief so frequently introduced over the lower windows, dividing what ought to be one solid mass into two miserably weak arches. What is it then that pleases so much, and so universally, in the works of this artist? It seems to consist entirely in a certain justness of proportion, with which he has distributed all the parts of his architecture, the basement being neither too high nor too low for the order above it; the windows of the right size and well spaced, and all the parts and proportions suited to one another. The same excellence is found in his orders, and the relation of the columns, capitals, entablatures, &c. He has not adopted the theoretical rules of another, but has drawn them all from what he felt to be pleasing to himself and suited to his own style of art; but they are not good, when united to a more solid and less ornamental manner.

Roman Discharging Arches.

The Romans appear to have been early accustomed to the use of discharging arches; they introduced straight arches (that is, an arrangement of bricks acting against one another as wedges, but kept in a line nearly or quite straight) over their openings instead of solid stone lintels, but aware of the weakness arising from this method of employing the materials they formed over them a semicircular arch, by which means the weight of the superincumbent wall was thrown upon solid parts which were able to bear it. In the earliest buildings which remain, and in general, even down to the time of Caracalla, this practice was used reasonably; and with moderation, but in later times arches were employed, not for use but for affectation; straight arches were employed where there were no openings, and discharging arches, which threw the weight rather on a weaker than on a stronger part.

The Gol Goomuz, Beejapore.

The tomb of Mohammed (the Gol Goomuz), Beejapore, consists of a square apartment, measuring 135 feet each way. At the height of 57 feet from the floor line it begins to contract by an arrangement of pendentives, as ingenious as beautiful, to a circular opening of 97 feet. On the platform over the pendentives is erected a dome, semi-elliptical in outline but circular in plan, 124 feet in diameter, leaving a gallery more than 12 feet wide all round. The internal height of the dome is 175 feet, the exterior to the apex 198 feet; the general thickness is about 10 feet. At the apex, however, it is nearly 18 feet; yet, if the tradition of the place can be depended upon, it was built wholly without centering. The most ingenious and novel part of the construction of the dome is the mode in which the lateral thrust is counteracted. In the

Pantheon, and in European domes generally, this is counterbalanced by a mass of masonry in the haunches, as is also the case in bridges. This mass, however, entirely destroys the outline, and is, to say the least of it, a very clumsy piece of masonry. Here the object is accomplished by hanging the weight inside: the massive pendentives having a tendency to fall inwards act as ties, and effectually accomplish the object without the possibility of derangement to the structure, as from their arch form they are perfectly stable in themselves. The external ordinance of the building is as beautiful as the internal. At each angle there is an octagonal tower of eight storeys, simple and bold in its proportions, and crowned by a dome of great elegance. The lower part of each face is plain and simple, pierced only with such openings as are requisite to admit air and light in that climate, and they are not a tenth of what would be required in ours. At the height of 83 feet a cornice projects to the extent of 12 feet, nearly double what the boldest European architect ever attempted, and above that an open gallery gives lightness and grace to the whole structure. Above the gallery is an ornamented band of fretwork, which is surmounted by a battlement of great beauty, relieved by eight smaller minarets, two on each face. On comparing this with other domes, it will be seen that it is the first in area. It covers more ground clear of support than any dome or vaulted roof in the world, while it is of more difficult construction, being placed over a square hall instead of a circular drum. Considered, therefore, either as a mechanical or as an artistic form it must rank among the first, if, in fact, it be not the most beautiful as well as the largest domical building, yet erected in any part of the world. The diameter of the Pantheon, Rome, is 142 feet; St. Peter's, 139 feet; St. Maria, Florence, 139 feet; tomb of Mohammed, Beejapore, 135 feet; St. Paul's, London, 112 feet; St. Sophia, Constantinople, 107 feet; church at Darmstadt, 105 feet. In the Pantheon the internal area of circle is 15,833 feet; the internal area with recesses, 19,086 feet; the whole area of building, 27,157 feet; the area of supports, 7,477 feet; the ratio of supports to area, 363 feet, while in the tomb of Mohammed the internal area of square is 18,360 feet; the internal area with recesses, 19,371 feet; the whole area of building, 24,964 feet; the area of supports, 5,593 feet; and the ratio of supports to area, 446 feet. The fact is the Indians knew so well the capabilities of domes that they could play with them and have no fear of their falling; we in Europe are afraid of them, and have never fairly tested their capabilities. Sir Christopher Wren shirked the question entirely by introducing a cone, constructively no doubt the best form for his purpose—artistically the worst, as he confessed by hiding it both internally and externally. Brunelleschi halved the difference, adopting a form slightly curved externally. The octagonal form of his plan rendered this tolerable, though not beautiful. For a circular dome it would be unbearable. Michel Angelo did better, and produced a bolder construction and a far more artistic form, and had he been able to secure his base constructively, without iron ties, his dome might have been eternal. Had either he or Wren known, for instance, of this Beejapore mode of placing a mass at the springing, sufficient by its inertia to resist any movement in the vault, and to convert all outward thrust into inward pressure, they might have constructed far larger domes far more solidly than they have done.

Perspective Drawings.

Laws of perspective are laws of nature. We only know what a building is by what we can see it to be. The geometrical elevation, section and plan of that building are merely the means by which a skilled person—a scientific person or an architect—is able to lay before the builder or the public the mode by means of which he intends to carry out his primitive idea, if it is an idea at all, of the building, the perspective effect of which he has in his mind. He must or ought to have imagined the building in perspective before he brought it upon paper. Architects' designs ought always, therefore, to be drawn in perspective. An architect, in fact, ought to think in perspective, and not think by the T-square and the drawing-board, for this is completely bringing down and reducing the function of the architect to the mere level of a simple geometrical transaction. It is not that. The architect conceives his building in his own mind first of all, but has to explain the way in which he wishes it to be executed so as to produce a certain effect upon the beholder, and that effect can only be understood and appreciated by the laws of perspective, and by the means which every person has of looking upon a building. It is undoubtedly right and just that the architect should give the idea as he originally conceived it. Some people may say that a perspective view does not give the original conception from more than one point of view out of a thousand; that is very true, and the more perspective views the artist can get the better for the purpose. There is another great objection to presenting a building solely in elevation, as it becomes difficult for even an architect to say what the effect of

certain projections will be. We know very well that every octagon put upon a square in geometrical elevation presents the same breadth from top to bottom. The moment we have it in perspective we see that the octagon is less than the square except from certain points of view; from the four cardinal points of view, if they may be called so, a very good geometrical elevation can be obtained, but from any other point of view you do not see that effect.

The First Exhibition of the Water-Colour Society.

The original projectors of the Society of Painters in Water-Colours held their first meeting at the house of Samuel Shelley, in George Street, Hanover Square, a miniature-painter of celebrity, and a protégé of Sir Joshua Reynolds. The parties were Shelley, Hills, Wells, Varley, Glover and Pyne. The outline of the plan being arranged and made known, some few names were added; subsequent meetings were held alternately at the residences of the aforementioned projectors, when it was at length resolved to form a society for the purpose of establishing an annual exhibition composed of original subjects, painted in water-colours, exclusively the works of its members. The first exhibition was opened to the public on April 22, 1805, at the Great Room, in Lower Brook Street, Grosvenor Square, which was built by Vander Gucht, an engraver, who, quitting that art, became eminent as a dealer in pictures. He was succeeded by his son, in the same business. The premises, after the decease of this gentleman, who was much esteemed both by dilettanti and artists, were occupied by Thomas Barker, of Bath, celebrated for his picture of *The Woodman*, who in the Great Room made a public exhibition of his own works. From Barker the premises were consigned to Tresham, who having little occasion for the Great Room let it, together with its appurtenances, to this Society, and therein appeared the first collection of works painted in water-colours, which could be seen to advantage and appreciated according to the merits of their respective authors. The following members contributed to the first exhibition:—G. Barrett, J. Cristall, W. S. Gilpin, J. Glover, W. Havell, R. Hills, J. Holworthy, J. C. Nattes, F. Nicholson, N. Pocock, W. H. Pyne, S. Rigaud, S. Shelley, J. Varley, C. Varley and W. F. Wells. No sooner was this novel exhibition announced than the members had reason to rejoice at the experiment. The room was crowded by the first personages, who appeared emulous to become purchasers of the works exhibited for sale. This successful commencement was greatly owing to a plan which had been suggested by a member and which had its desired effect, namely, that of having a person in the room who was furnished with a book containing the prices of each picture. Conditions of sale were also inserted, and the purchaser on entering his name therein advanced a deposit of 10 per cent. on the price affixed to each work, and bound himself to pay the remainder on delivery of each purchase. Hitherto very few instances could be named of the pictures of living artists being disposed of at a public exhibition, whilst here the room at once became an excellent mart for sale. The subsequent success which has continued to attend on their exhibitions, in the increase of patronage and other favourable circumstances, is an existing proof of the good sense and foresight which dictated the measure.

Points of Support.

He is the ablest constructor who, with the least surface to his points of support, upholds the greatest weight uniting strength and economy. The freemasons of the Middle Ages have established the principle of construction that, with equal quantities of material, a thin wall with buttresses has greater strength and stability than a thicker wall without. Piers with equal superficies of base, as a circle, a square, an equilateral and a right-angled triangle, have the following strength approximately:—100, 93½, 86 and 76½. A square is to a parallelogram as 100 : 95. The strength of a wall depends rather upon its stability than upon the greater or less hardness of the materials. The stability of solids diminishes in proportion to the height of the centre of gravity.

Architect's Estimates.

It is one of the morals of architecture that the architect should never lead his employer into a useless expense, nor into one which his means would not enable him to afford. It is a breach of integrity which nothing can render excusable. Vitruvius records a wise law of the Ephesians. When an architect was employed upon a public work, he was required to declare the amount it would cost, and his goods were made over to the State. If the work cost one-fourth more than his estimate, it was allowed; if it were less, he was loaded with honours. But if the expenditure exceeded the prescribed limits his property was sacrificed to make good the deficiency. It is said that Vanvitelli, having exceeded his estimate in a public work connected with the execution of one of the fountains of Rome, was mulcted in the sum of 5,000 crowns.

NOTES AND COMMENTS.

WE suppose it was to be expected that the Corporation of Manchester and the directors of the Ship Canal could not long co-operate without a breach. The short experience of the working of the canal can hardly be considered as warranting a belief that it will soon be as profitable an enterprise as was anticipated. The people of Manchester might be able to wait patiently for a few years without high dividends, but what is hard to endure is the prospect of having to contribute still larger sums of money before the canal can be considered as capable of meeting all kinds of traffic. The advances to the canal company will shortly require the imposition of a rate of about 1s. 8d. in the pound, and if more money is given the rate will have to be increased. When it was first proposed that the Corporation should come to the rescue, a sum of less than a million was supposed to be enough to enable the company to overcome financial difficulties. Afterwards the Chairman formally put down the amount at 1,700,000*l.*, and it was stated that "this apparent deficit is mainly due to the lock-up of the plant and other assets which cannot be realised until the canal is completed." The Corporation, before obtaining powers to make the advances, obtained an independent estimate, and it was then found that the amount rose to 2,313,173*l.*, including 15 per cent. for contingencies. On that basis an Act was obtained. It was soon found that the cost of the work to be done was underestimated. Another estimate increased the amount by 863,595*l.* But the data for several items was incorrect. For instance, "dock equipment sheds, &c.," was put down at 90,000*l.* But that one item has already cost 279,390*l.*, and a further outlay of 168,000*l.* is absolutely essential. There was another item of 5,500*l.* to reinstate a chemical manufactory near Runcorn. The expenditure has been 80,000*l.* Coaling ships which were to cost 10,000*l.* have already cost 46,000*l.*, and will still need 10,000*l.* A diversion of a stream was estimated at 2,500*l.*; the outlay will be 22,000*l.* For dredging an approach at Eastham the estimate was 36,000*l.*, and the expenditure 76,000*l.* From the Corporation or taxpayers' standpoint the obligations incurred by the company are more grievous, for the fulfilment of them would nearly exhaust the municipal resources. It is the unknown liabilities which are most to be feared, and it would be absurd for Manchester to allow itself to be converted into "the predominating partner" without having proportionate control of the undertaking.

THE Parisian amateurs are rather chary about forming costly collections of paintings; still there are a few in Paris and the neighbourhood of the city. The *Figaro* has drawn attention to the most important. First comes the collection of the Duc D'AUMALE, which eventually will pass into the possession of the State. It contains RAPHAEL'S *Three Graces*, for which 25,000*l.* was paid, and his *Madonna of Orleans*, which cost 6,000*l.* In Paris the collection of M. CHAUCHARD, one of the owners of the drapery shops known as the Louvre, is pre-eminent, for it is worth about a million sterling. Among the contents are MILLET'S *Angelus*, which cost 30,000*l.* In Baron ALPHONSE ROTHSCHILD'S gallery is RAPHAEL'S *Cesar Borgia*, from the Borghese collection, which cost 600,000 frs. Baron GUSTAVE ROTHSCHILD possesses MEISSONIER'S *A Reading at Diderot's*, which is supposed to be worth a similar sum. Two works by REMBRANDT in Baron EDMUND ROTHSCHILD'S collection cost 750,000 frs. Into whose possession RAPHAEL'S *Violin Player* has passed is not mentioned by the *Figaro*. M. MARIUS BIANCHI can enjoy the sight of twenty paintings by MEISSONIER. The *Bowlers*, by the same artist, belongs to the Marquis DE CASA RIERA, and the "1814" to the Duc DE MORNAY. M. BISCHOFFSHEIM possesses *A Country Dance* by WATTEAU, for which 10,000*l.* was paid. M. ROUART owns over sixty pictures by COROT. M. BOUCHERON, the jeweller, has given the preference to COROT, FROMENTIN and ROUSSEAU. For examples of MANET'S Impressionist experiments there is no collection so rich as M. FAURES', and the Marquis DE BIRON has accumulated pastels of the eighteenth century. The importance of the private collections will appear greater if compared with the few which existed in Paris fifty years ago.

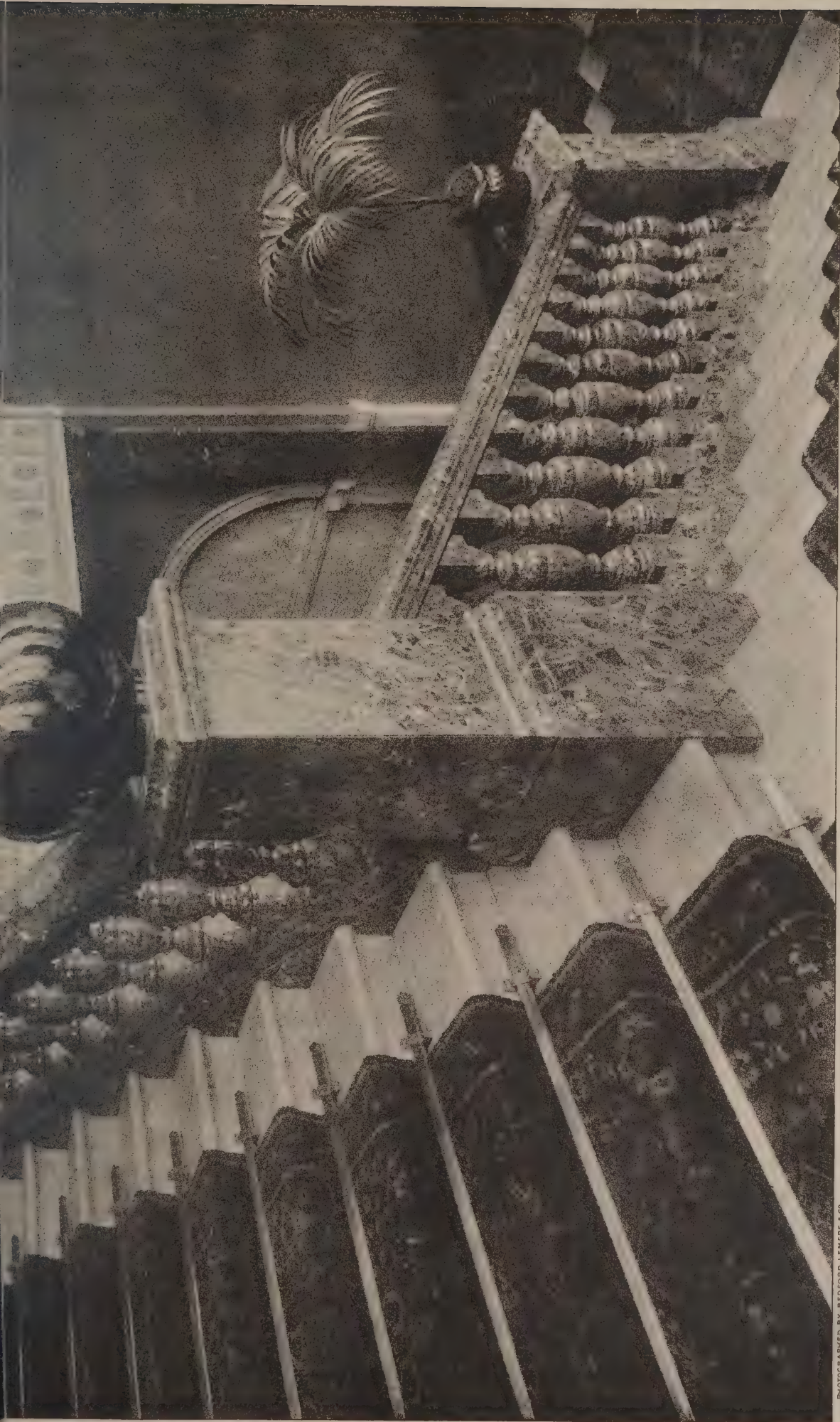
THE Burgh Police (Scotland) Act of 1892 will have an important effect on the utilisation of sites for buildings. It will no longer be possible for an owner to dispose of his own land as he may desire. An example of the change which has taken place was afforded a few days ago in Paisley. A grocer proposed to take down two houses, and on the site to erect a four-storey tenement house. Application was made in the Dean of Guild Court for approval of the plans. The Master of Works objected because the stipulations of the new Act were not observed, for three-fourths of the area must be free as an open space. The applicant's lawyer argued that the clause was vague and misleading, for it stated that the three-fourths air space behind a property should be "attached thereto," but did not state that the space behind should belong to the proprietor of the building. There might be plenty of air space, he said, behind a tenement, and yet all the ground might not belong to the same proprietor. It was also contended that a distinction should be drawn between buildings to be erected on a new line of street and the taking down and re-erecting of properties on existing sites. The Court was not to be persuaded that the Legislature did not contemplate dealing with each site by itself. The application was accordingly refused. It will therefore be necessary to modify the plans considerably, and to contemplate the erection of a much smaller house.

THE ratepayers are likely to have to face a new and costly series of alterations in the London Board Schools. The Hackney divisional members recently recommended that the hall in one of the schools at Haggerston should be made suitable for holding public meetings, and for the assembling and drilling of the children. The architect visited the building and applied tests. He found that with a class of forty-five children placed four abreast in the centre of the hall (and with the ordinary drill), there was found to be a considerable amount of vibration, and with a class of sixty-five children similarly placed and brought close together, the vibration was very noticeable. Under the dance-step the floors deflected about an inch when the spring for final step was taken. The mistress stated that the vibration prevented her from writing at her desk in the hall when the children were walking in step from one classroom across the hall to another. As the introduction of an occasional steel joist would not give the desired stiffness the architect recommended the reconstruction of the floor in iron and concrete with a wood-block covering. The cost is estimated at 480*l.* What is necessary in Haggerston is likely to be carried out elsewhere, and it may therefore be assumed that an expenditure of 500*l.* per school for new flooring in the halls will be comprised among the numerous "repairs" or transformations which are comprised in the budgets of the London School Board.

THE Municipal Council of Paris deserve credit for perseverance in setting up plaques which will enable citizens as well as strangers to identify houses which are associated with celebrities. The latest cases are the following:—No. 29 Rue Etienne Marcel, which is connected with the history of the French drama for over two centuries. It was there the Confraternity of the Passion performed mysteries, and where the Sans Souci troupe, the comedians of the Hôtel de Bourgogne, the Italian Comedy and the Opéra Comique afterwards exemplified different forms of acting in the period between 1547 and 1783. The other houses were also occupied by men or women who in various ways were connected with the stage. GRÉTRY, the composer, occupied part of No. 9 Boulevard des Italiens; in No. 32 Rue St. Denis EUGENE SCRIBE, the prolific dramatist, was born; HONORÉ DE BALZAC, who was far less successful with his dramas than with his novels, died in the house at the junction of the Faubourg St. Honoré with the street now called Rue de Balzac; ALFRED DE MUSSET, whose "Proverbes" are still employed as curtain-raisers, was born in No. 33 Rue des Roys; finally, SOPHIE GERMAIN, the actress, died at No. 13 Rue de Savoie. When may we expect to see the London County Council placing commemorative plaques on houses in the Metropolis which have gained "betterment" by the residence of men and women who are worth remembrance?

Die Architektur, June 15th 1894.





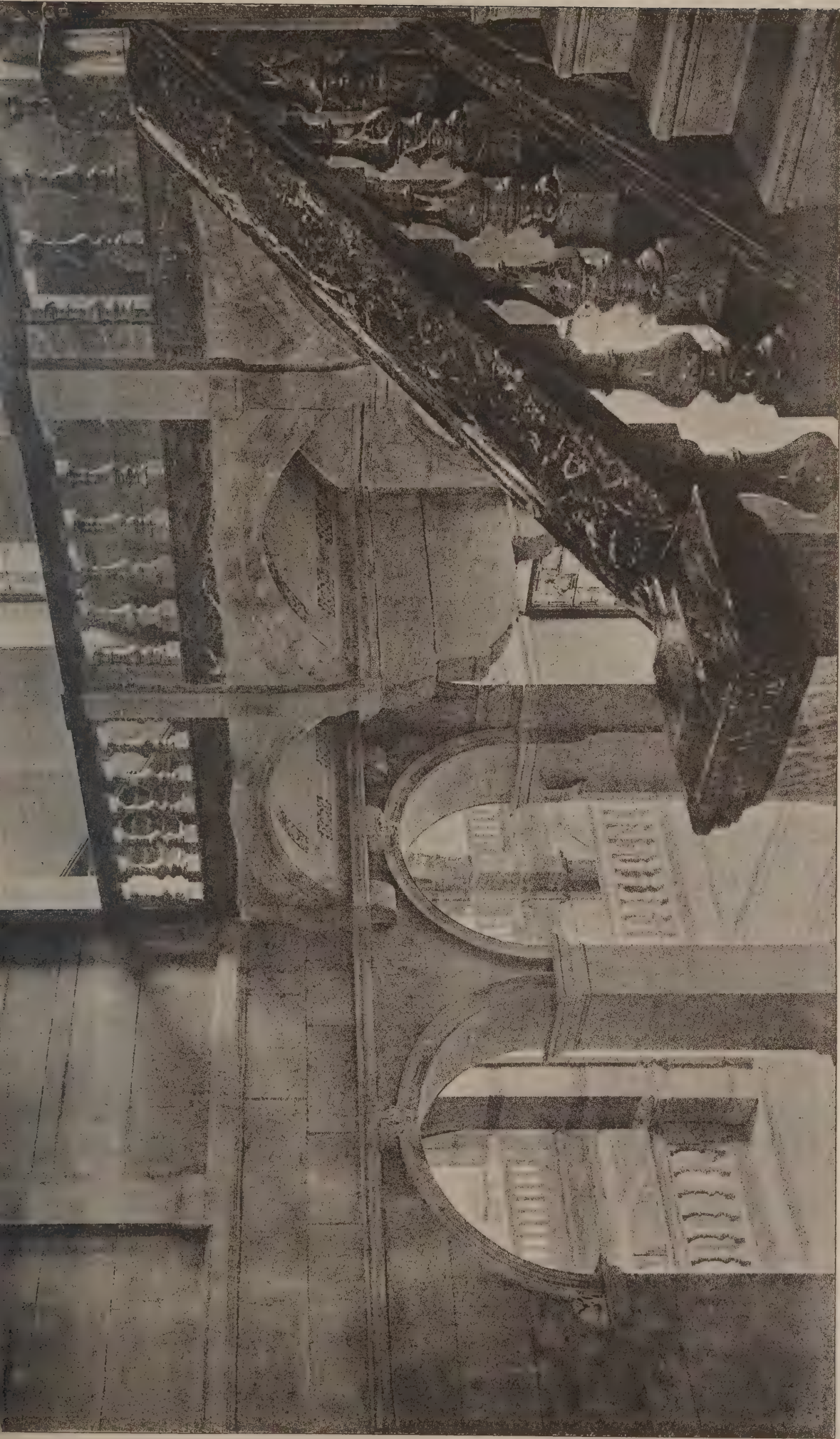
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STAIRCASE: JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

R W EDIS, Architect.



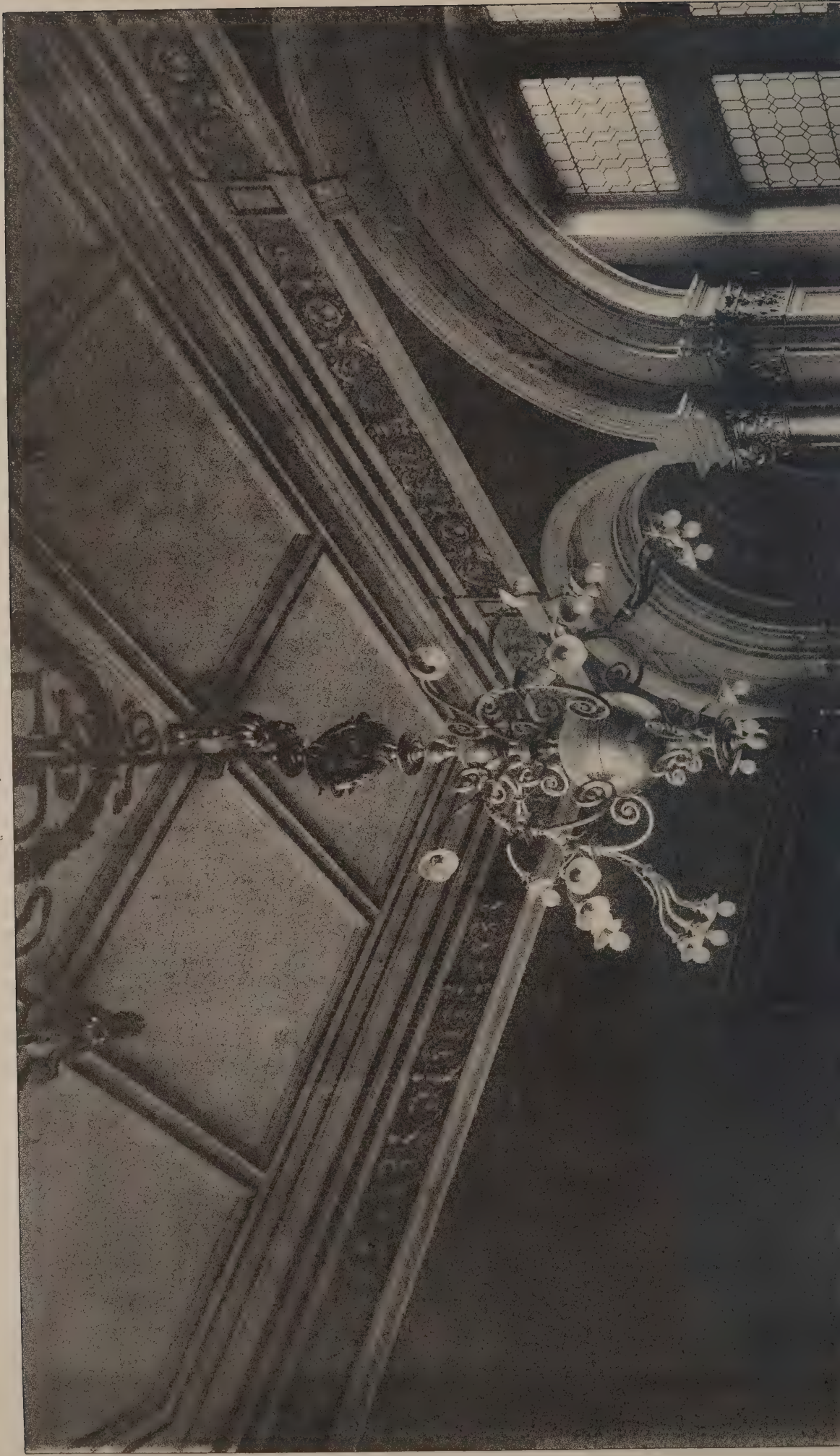


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STAIRCASE: IMPERIAL INSTITUTE.
T. E. COLLCUTT, Architect.

The Architect, June 15th 1894.



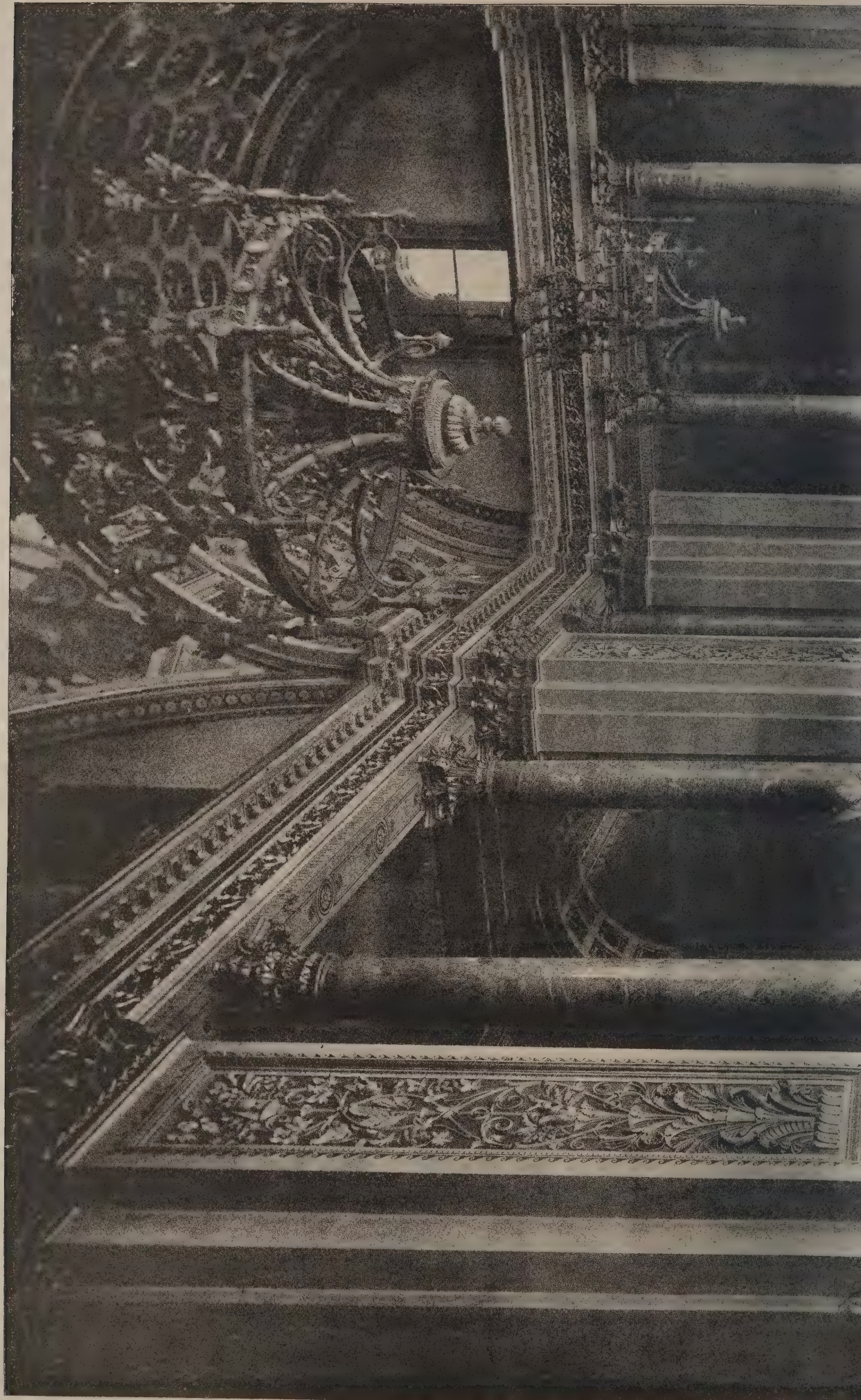


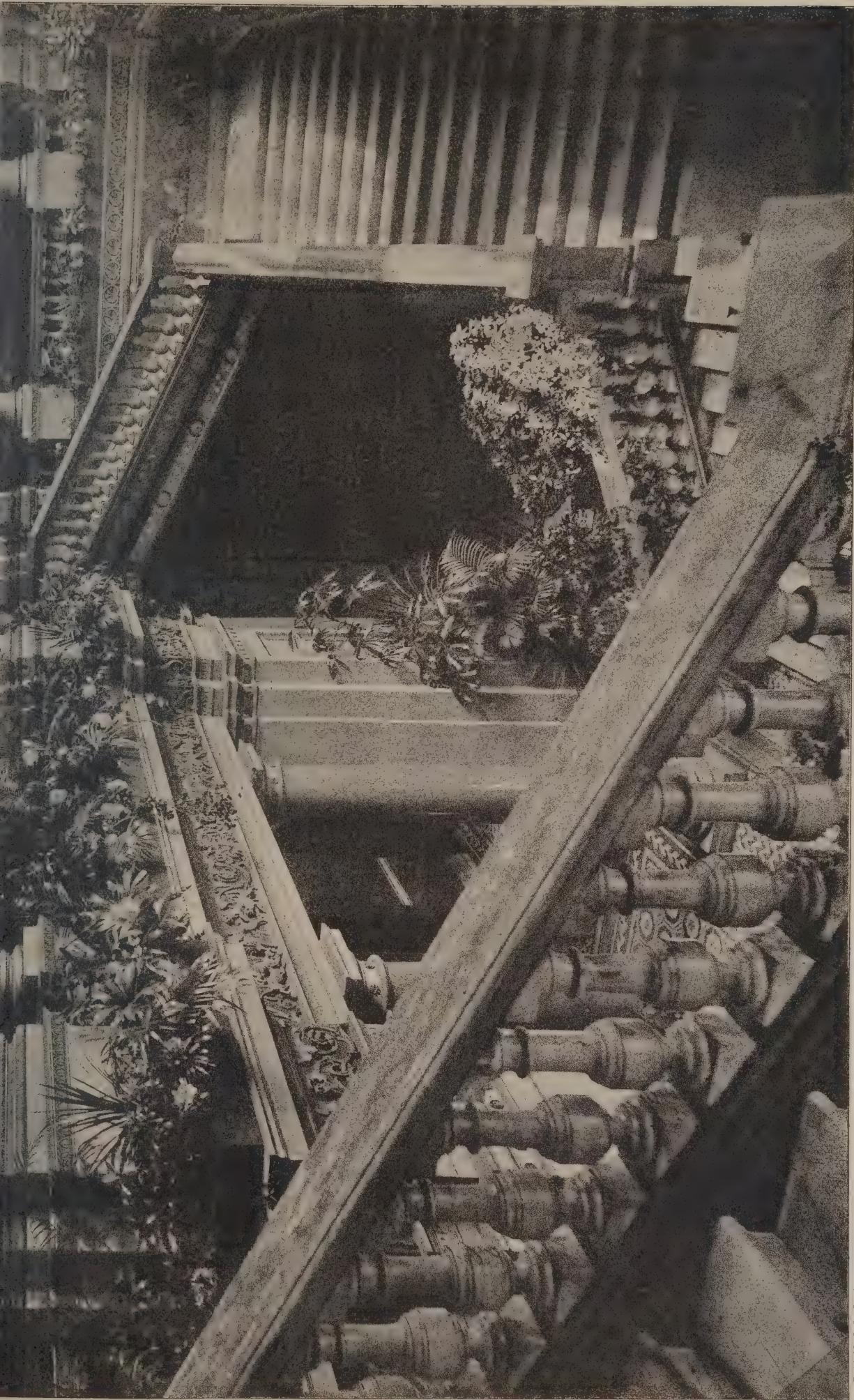
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STAIRCASE: FREE PUBLIC LIBRARY, EDINBURGH.
G. WASHINGTON BROWNE, Architect.

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The Architect, June 15th 1894.





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GRAND STAIRCASE: FOREIGN OFFICES, WHITEHALL.
The Late Sir G. G. SCOTT, Architect.

ILLUSTRATIONS.

GRAND STAIRCASE.—FOREIGN OFFICES, WHITEHALL.

STAIRCASE.—FREE PUBLIC LIBRARY, EDINBURGH.

STAIRCASE.—IMPERIAL INSTITUTE.

STAIRCASE.—JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.

EGYPTIAN DECORATIVE ART.

IN his third lecture before the Royal Institution on "Egyptian Art and Decoration," Dr. W. Flinders Petrie said that in the persistence of certain forms which were the direct result of the structure of a building or object we have a very considerable source of decoration. In Greek architecture many details are entirely the product of wooden construction translated into stone. The triglyphs, the imitations of nail heads, and of the ends of the poles supporting the roof, are details retained as decoration long after they ceased to have any structural meaning, owing to an entire change of material. Such is structural decoration in its best-known form. But the same principles equally apply to Egyptian architecture where the original material was the papyrus and palm branch with mud plastering and mud bricks; and the details of the stone architecture have come down from this stage translated into stone, as the Greek translated his into marble. But pottery preceded stone in Egypt, giving rise to one of the simplest ornaments. In the Egyptian yards still may be seen bowls and jars held together by a twist of rough palm fibre cord, while they dry in the sun before baking. This marking is to be seen on the pottery of all ages; but it was developed as a pattern in the twist or *guilloche*, probably rather derived from this than from the chain of coils or wave pattern. Basketwork was elaborately developed in the old kingdom. There are beautiful screens behind the figures of the owners of the early tombs; these in some cases might represent matting, but others appear to be of a rigid material. In no case were they "mats on which the kings stand," as styled by Owen Jones. Among the squares, waves, zigzags, chequers, &c., some are made by binding the fibres into bundles, which may have led to the common pattern of connected rhombs. Wooden framing is one of the most familiar early motives, and it is frequently imitated in the stone figures of doorways in the tombs, showing that a lattice frame must have been used in former times, as it is now, to admit light and air while the doors of the house were fastened. The same style was used in the upper portion of the dwelling with decorative uprights of the hieroglyph *tat*, and was copied as a fancy decoration in furniture, as shown in a beautiful ivory carving in the Louvre. This style survived till the eighteenth dynasty, and is seen in a tomb at Thebes. Akin to this is the panelling of the brickwork, identical with that of walls in early Babylonia, an indication of the common civilisation of the two great valleys. A well-known characteristic of Egyptian architecture is the sloping faces of the walls and pylons. To give more cohesion to a wall it was built on a curved bed, so that the courses all sloped up outwards at the outer corners, and the outer faces sloping inwards, the wall had more stability. This was copied in stone at the earliest time. The temple of Senefru, at Medum, has a slope on the face of about 1 in 16, and this custom continued down to the very latest age of Roman building. Another familiar feature is the roll or torus, down the corners of the building, usually ornamented by a pattern of binding. As Professor Conway has well pointed out, this was evidently a bundle of reeds bound together and put down the angle of the plastering to preserve it from breaking away; ugly at first, but copied in stone as a decoration for 4,000 years, as long as Egyptian architecture lasted. The European habit of seeing a hidden sense in every flower was not akin to the simple and elementary Egyptian. But he used certain striking emblems, one of the earliest being the uræus snake or cobra, in his wrath, reared with expanded body, ready to strike. The dignity and power of the animal made it an emblem of the king, or rather of the royal power of death. The Westcar Tales show that capital punishment was in use in Egypt, where in the old kingdom a condemned malefactor is ordered forth for a magician to try his power in bringing him to life when slain. The uræus was on the head-dress of the king, and from the earliest days (at Medum) the court had a cornice of uræi. In later times it was used on any royal structure. Connected with this symbolism is that of the globe and wings, dating from the beginning of the monumental age, and is seen above the figure of Khufu seated before a table of offerings, on an amulet, although the scale is

too small to show the details. What its symbolism was we do not know, but as the spread wings are those of the vulture, it seems to present the same idea—the power of life and death. But it is Ra who wields this power, and that the wings give the meaning of protection is shown by their embracing the royal name and guarding the king. The vulture alone as the emblem of protection is frequently figured with outstretched wings across ceilings and passages of royal tombs. The imposing sight of this bird, with its wings stretched at a span of about 19 feet, hanging close overhead, must have always excited the admiration of men. The scarab was another typical animal, rolling the pellet containing an egg to a safe place, where it buries it. Though very common as an amulet for the king and the dead, it is not often seen in symbolical or decorative use otherwise. It is often figured as holding the disc of the sun in its claws, and it is possible that the symbolism arose from the burial of its ball being an emblem of the setting of the sun to rise again to new life. The lion frequently figures in the eighteenth dynasty. The Egyptians had a marvellous instinct for taming animals, and trained lions or leopards to live domesticated like modern hunting dogs. The lion went to battle with the king, but in camp lay down as peaceable as an ox. It was frequently carved on the sides of thrones of the eighteenth and twentieth dynasties, and also seated in pairs, facing or backing on the temple walls, a usage recalling the lion gate of Mycenæ of the same age. Some Egyptian divinities appear as ornaments, such as the goddess Uaat, Hathor and Bes, who was one of the favourite popular deities. The little statuette of a dancing-girl with a Bes mask found at Kalmu shows his popularity in the twelfth dynasty. At Tel-el-Amarna ornaments for necklaces in glazed pottery show him dancing with a tambourine and with arms a-kinbo, and in the Roman age he is seen in the dies above the columns at Denderah in the temple of the Mammeisi. The hieroglyphic signs also served for symbolic decorations, as the Egyptian mode of writing could by a single mark express an abstract idea, and this has been done even in alphabetic characters, as in the elaborate crossing patterns of the earlier Arab period in Egypt. Four hieroglyphs are the most usual—the *ankh*, a girdle, symbol of life; the *hat*, possibly a feminine girdle, and always identified with Isis; the *was*, a stick of authority, and the *dad*, a row of columns, symbol of stability. The *sam*, or symbol of unity, is also used, and it is plainly a column of some kind, with a well-marked capital and an abacus. Another design came into fashion during the great foreign wars of the eighteenth dynasty, representing two captives, one negro and one Syrian, bound back to back against the *sam*; thus it symbolised not only the union of Upper and Lower Egypt, but also of the northern and southern races outside of Egypt, and later on we find four or even six such racial types figured as bound together.

ROMAN PALACES.

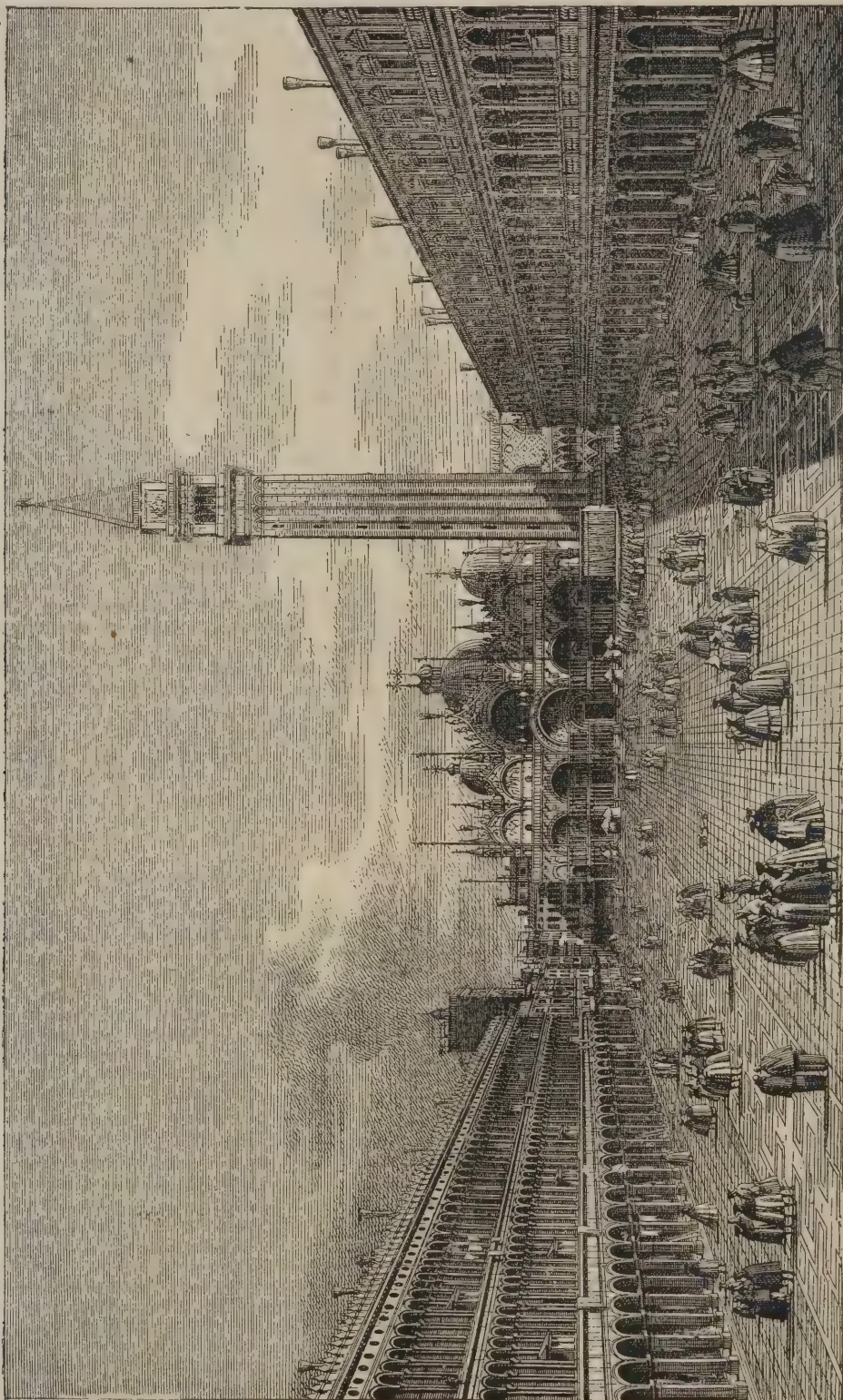
TO an architect, the modern palaces of Rome are invaluable as a collection of experiments on architectural beauty on a grand scale and in a grand style, for however they may be abused as extravagant, absurd or preposterous, they at least avoid the greatest fault that a building can have, that of being mean and paltry. The Romans, even in these their degenerate days, have adopted a style fit for those who had the world at their command. These palaces are rarely decorated either with columns or pilasters, and they are better without them, for these never look well in a building of many storeys in height. Ornaments round the windows are never omitted, and never should be omitted, for without them a window is a mere hole in the wall. The Roman architects have more often erred in making these dressings, as they are called, too large than too small, and their details are frequently very bad; yet even in their worst state they contribute greatly to the general beauty of a building, much more so when they are well designed. The storeys are generally divided by horizontal bands or mouldings along the front, and great space is left between the ranges of windows. This latter circumstance is of great importance. It gives an air of solidity and magnificence to the front, and suggests the idea of lofty rooms within, and it is a great point gained when, in addition to the magnificence which is seen, the artist can excite the idea of other magnificence which is not seen. This space is, however, sometimes broken by a disagreeable mezzanine. The whole is crowned by a large and rich cornice. The perfect beau-ideal of such an arrangement is not to be found in Rome, although some of its palaces are highly beautiful, but it cannot fail to be excited in the mind of an architect who attentively studies them. The body of the edifice is nothing but a useful dwelling-house, the ornaments naturally arise out of the construction required for such an object, and the design is capable of any degree of magnificence suited to the rank and consequence of the owner. In short, we find in it everything which can satisfy the eye, the imagination and the judgment.

CANALETTO AND VENICE.

WE publish this week reproductions of two of Antonio Visentini's engravings after paintings by Canaletto, from M. Moureau's "Antonio Canal" (Paris: Librairie de l'Art), a work which was noticed in a late number. The two subjects, like most others in *la Città d'oro*, are not strange to our readers, for, as Valery says, "the paintings of Canaletto have so familiarised us with the harbour, the squares and monuments of Venice, that when we penetrate into the city itself, it appears as if already known to us."

international resort is less evident than in Valery's time, when it was without a rival. "The East and the West," he continues, "are there brought into each other's presence. There are Turks, Greeks and Armenians, some lying down, others taking coffee and sherbet, under large awnings of different brilliant colours, resembling tents; some smoking perfumes in their long amber-tipped pipes of rosewood, a crowd of indolent and majestic automata, while European travellers and others, occupied with their business, are hurriedly passing to and fro."

At the top of the Piazza are to be seen the basilica of St.



THE PIAZZA, ST. MARK'S

By Canaletto,

One of the plates represents the famous Place, or Piazza, which in Canaletto's time was enlivened by a greater variety of costumes than he introduced. In the early part of the present century Valery could say, "Venice still palpitates on the Piazza of St. Mark; while other quarters possessing magnificent palaces are allowed to fall into ruins, a million of francs are expended yearly in upholding the Piazza. The corpse of a city, to employ the expression of Cicero's friend, is already cold at its extremities; the life and heat which remain are confined to the heart." At the present time there are occasional signs of animation in the Piazza, but its character as an

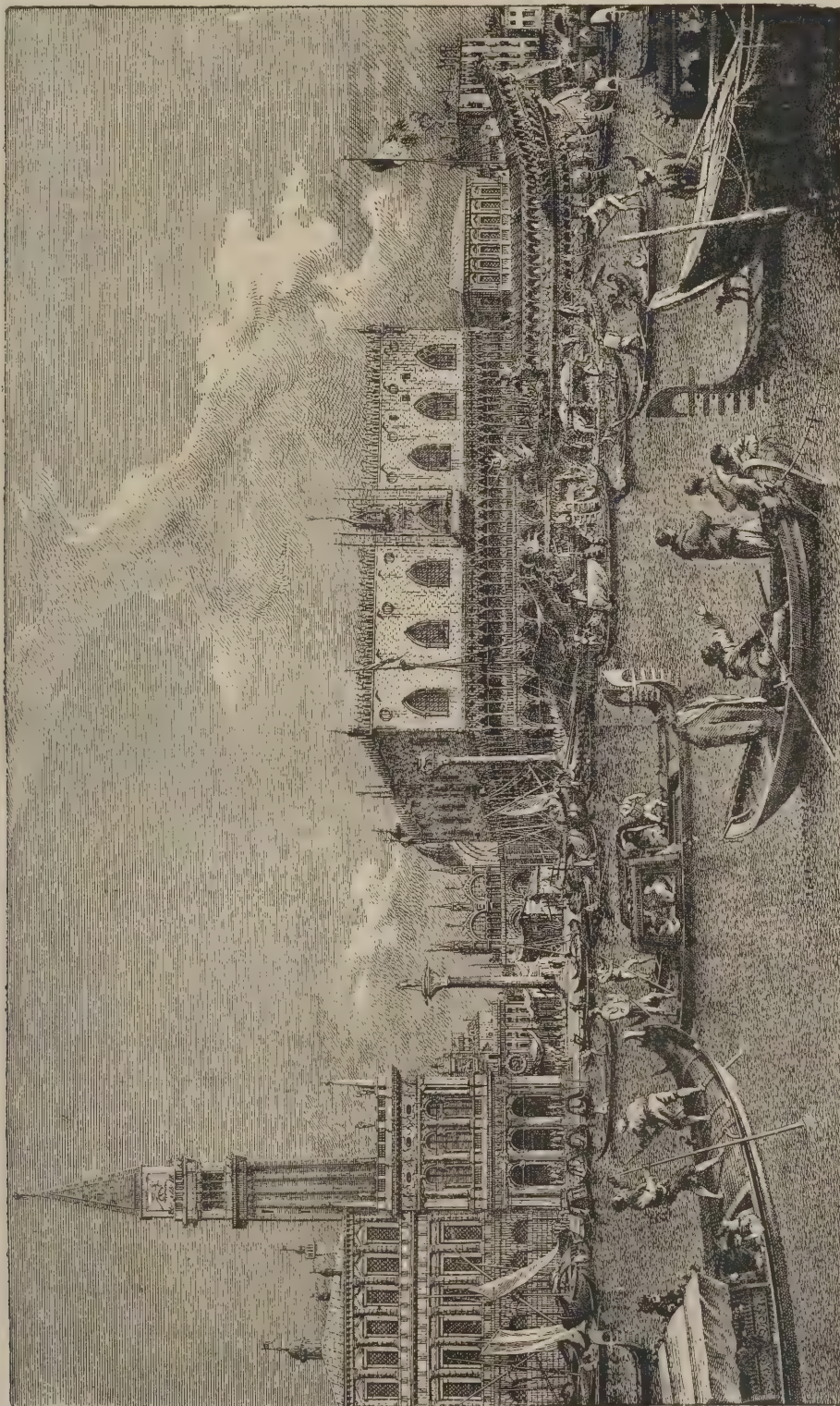
Mark, the Campanile and the Ducal Palace. Not unworthy of such companionship are the three bronze pedestals modelled by Leopardi for the masts which sustained the standards. The row of buildings on the left, or northern side, dates from the end of the fifteenth century, and was designed by Bartolommeo Buono, who completed the Campanile. The row on the right side is by Scamozzi. But almost as much credit must be assigned to Sansovino, for the lower arcades and those of the first floor were determined by the adjoining Biblioteca Vecchia, the building which, through the collapse of a ceiling, brought Sansovino into disgrace, and caused him

to be punished by fine and imprisonment. Palladio considered the Library to be the richest and most ornamented building that had been constructed since the times of the ancients. It was employed by Smirke as the *motif* for the Carlton Club in Pall Mall.

In the quay view we again see parts of St. Mark's, the Palace, the public clock, and the Campanile. There are also the Piazzetta, leading from the Piazza, with the columns of St. Theodore and the Lion of St. Mark, a façade of Sansovino's Library, his Zecca or Mint, and on the other side of the Palace is the Prison. Canaletto cared only for exterior views, and as

overhauled, it was accepted as remaining unchanged. It was well old Howell's criticism was not known in Venice, for to say, "I believe there is not a foot of that timber remaining which it had upon the first dock, having been, as they tell me, so often planked, ribbed, caulked and pierced," was a crime that was enough to have a man conducted to the piombi or the pozzi.

The Bucentaur was about 100 feet long and 21 feet in width, and to move it 168 oarsmen were required, besides 40 sailors. The carving alone formed an immense weight, for the barge was covered with figures of marine deities, sirens, winged lions, allegorical figures, shells, medallions, and in fact everything



THE DUCAL PALACE AND THE "BUCENTAUR."

By Canaletto

the Quay and Piazzetta were his favourite resorts, he was glad to represent them as they appeared on Ascension Day, the great festival when the doge undertook an excursion in the Bucentaur or State galley, in order to wed the Adriatic. The origin of the name is doubtful, but whether the vessel was in any way suggested by a taurus or bull or a centaur, it was one of the most extraordinary examples of naval architecture. We speak of it as if a single Bucentaur existed during seven centuries, for by one of those fictions which are common in Government business, although the barge was always being

that could suggest the purpose of the structure or the greatness of the owners appears to have been introduced. The upper deck was covered with an awning of crimson velvet, beneath which the doge, senators, grantees and ambassadors were seated. The doge was enthroned in the stern, and the most distinguished guests were around him.

The excursion was intended to celebrate a victory obtained in 1177 by Doge Ziani over the Emperor Frederic Barbarossa. The Venetians were then upholding the cause of Pope Alexander III., who after the victory presented the doge with a

ring, saying, "Take this ring, and with it, on my authority, the sea as your subject. Every year you and your successors shall make known that by right of conquest the Adriatic has been made subject to you as a wife to her husband." Accordingly on Ascension Day the doge and his guests were rowed to the Lido, and at the mouth of the harbour he cast a ring into the Adriatic, uttering the formula, "With this ring we wed thee in token of our true and perpetual sovereignty." It was always understood that the water was cognisant of the honour of becoming the doge's bride, and dutifully remained in a placid condition during the ceremony. If there were matrimonial storms the captain paid the penalty.

The two illustrations will suggest the character of those in M. Moureau's book. They comprise the most characteristic examples of Canaletto's architectural views, and form one of the best memorials of Venice which the visitor can possess.

THE ASSOCIATION AND WORKSHOP PRACTICE.

THE following correspondence is found in the last number of the *A.A. Notes* :—

The Architectural Association, 56 Great Marlborough Street, W. : May 24, 1894.

Dear Ashbee,—The more I think over the scheme which we discussed when I visited you at the Guild, the more convinced I am that it is a practical one and calculated to benefit our A.A. students in exactly the manner which the best spirits amongst us have so long desired; I mean, of course, the placing within the reach of our students opportunities for gaining practical knowledge in the workshops as supplementary to the instruction given at the Association.

If this scheme is to be put forward during next session it would be necessary that some active steps should be taken at the earliest possible date, and with this view I am sending you a few proposals :—

1. That the A.A. students be drafted at the end of, say, their third year into a practical workshop, to get experience of its workings, to work out designs of their own and to learn the limitations of various materials by working with their own hands and to come into direct contact with the workmen.

2. That this should be arranged by a fixed charge of, say, seven guineas per student for the year.

3. That it form a definite continuation of Division III. or other divisions or classes in the A.A. curriculum.

4. That the above object be accomplished by affiliating to itself the workshops of the Guild and School of Handicraft. (See Brown Book, p. 187.)

5. Whether you as director of the Guild and School of Handicraft would be willing to enter into some provisional agreement with the view of carrying out the above proposals.

If you could let me have your views as to this scheme before Friday evening next I would lay it before the committee in order that time might be saved.

6. I should be very glad to know what you think we might do in order to make the financial side of the above scheme more possible.

Do you think the London County Council could be asked to assist in the form of scholarships to be held under certain conditions, say, ten or twelve scholarships of 10*l.* and one or more of 25*l.* for the best man?—Yours sincerely,

(Signed) F. T. W. GOLDSMITH, hon. sec.

Mr. C. R. Ashbee, M.A.

[COPY.]

Maggie and Stump House, 37 Cheyne Walk, Chelsea :

May 25, 1894.

Dear Goldsmith,—I am glad you think the scheme we discussed is a feasible one, and speaking provisionally, in reply to your letter of May 24 I am prepared provisionally to endorse it. Subject, however, to the following reservations and conditions, and if it would not be amiss, might I suggest it for you to add them to the clauses proposed in your letter?

In clause 2 I do not see how the scheme is financially possible at the rate of seven guineas per head, unless the freedom of the pupils as regards the workshop is curtailed, and the class system is introduced. We want your fellows to have the "run of the shop," plus "personal supervision and teaching" continually. We cannot do this unless there is a margin. Put the case thus :—If we took an ordinary "gentleman apprentice" into the shop we should require of him a premium of 30*l.* at least, then the value of his work, if any, at the end of his time, and his work would be of some value, as we should put him on to a definite line and be productive. To your men we propose to give the same advantages, but as the teaching is not with a view to direct production, there will be no productive gain. I fear, therefore, that you must regard 10*l.* as the minimum possible sum per head unless, as I say, the class system is introduced.

You might, therefore, add the following to your clauses (under clause 5) to which I provisionally agree :—

(a) That students shall have practical teaching from skilled artisans in the following subjects :—Ironwork, carpentry, joinery, wood-carving, hammered and chased metalwork, hollow-ware, work in precious metals, enamelling, leather-work, work for constructive purposes in wax, clay, plaster, and if circumstances permit, in stone masonry and carving. They could also have a special training in the drawing and measuring up of old buildings in our proposed London survey.

(b) That the teaching shall be conducted less in the form of classes (as is customary at technical schools) than by direct personal supervision from the artisans skilled in the different crafts above-mentioned.

(c) That as the object of the scheme is the application of design to material, it be considered an integral part of the scheme that the pupils bring their own designs for criticism and execution in the workshops.

(d) That the students shall be during their year of teaching considered as under my discipline and guidance, but that the whole course of study and its arrangement be under the direction and control of the A.A. general committee.

(e) That a minimum number of ten students be provided by the A.A., and the fee, 10*l.* per head, be paid collectively to the Guild and School of Handicraft in regular monthly or three-monthly instalments.

(f) That this sum include only such materials as shall be deemed necessary by the instructors at the Guild and School of Handicraft for the teaching proposed, but that either the A.A. or the individual pupils pay the cost of any material needful for carrying out special designs.

(g) I may add that the school or educational committee of the Guild and School of Handicraft would be willing, if necessary, to entertain the idea of co-opting on to it a representative of the A.A.

Your suggestion, sixth, as to the County Council, I think excellent, and I shall be glad to help you in that direction if I can.—I remain, yours truly,

(Signed) C. R. ASHBBE.

Mr. F. T. W. Goldsmith.

AN AMERICAN JUDGE ON ARCHITECTS' DUTIES.

THERE are occasionally grounds for complaining of the summary view which is taken in the courts when architects bring actions for the recovery of fees. As a contrast, the following charge delivered in the Supreme Judicial Court of the State of Maine on the case *Arthur Rotch and another v. Fry and another*. The *American Architect*, to which we are indebted for the report, describes it as "the best presentation ever made in a court of record in this country, and perhaps the best ever made anywhere, of the duties of an architect," and our readers who have had to appear in cases of the same description will agree the praise is merited :—

The plaintiffs are a firm of architects in the city of Boston, of long experience and skilled in the art of building. The defendants, the owners of a site for a house or a residence which they contemplated building, at Bar Harbour, applied to them and sought their services. They inquired of them their terms, and there was handed to them a schedule of prices. With that they appear to have been satisfied, and thereupon engaged them to perform the work, and, in the absence of any further stipulation or agreement between them, the law would imply a promise on their part to pay the prices there stipulated. So that, in this case, the prices which they would be required to pay, and which the plaintiffs are entitled to receive, are the prices given according to the schedule which was furnished to the defendants at the outset. So far they cover the services that were called for or were required. I do not understand that the learned counsellor for the defendants denies this. On the other hand, I understand him to admit that, if his clients are liable at all in this case, they are liable to pay for the services charged according to that schedule, less so much as shall be deducted therefrom on account of conditions that I may call your attention to hereafter.

It appears that the defendants carried to the plaintiffs' office some sort of a topographical sketch or plan of their house site. The plaintiffs did not visit the locality, and did not have an opportunity to examine the ground. I do not know that it appears in the case that they were requested so to do, or required so to do at any rate. I think there was some testimony on the part of some of the witnesses as to whether it would or would not be necessary. At any rate, the services were undertaken to be performed without visiting the locality, the plaintiffs being guided by such information as the defendants could give them and such information as the topographical sketches or plans would indicate. Some consideration arose as to whether or not the house should be built with a projection, or L, at right angles with the main structure, or whether

it should be built with a diagonal projection. You have heard the evidence in regard to that. The defendants contend that they allowed the plans to go on by reason of an assurance on the part of the plaintiffs as to the feasibility of the square or the projection at right angles, that they allowed them to go on by reason of the advice and assurance of the plaintiffs as to the cost and feasibility of it, and were guided wholly by their judgment.

The plaintiffs continued in the execution of the plans; they procured the details and perfected the entire set of plans. For some reason those plans were rejected by the defendants. The plaintiffs say that it was because they did not give the house sufficient size and capacity and arrangement to suit them, and that they preferred an entirely different house, a house of different dimensions and different architectural proportions. The defendants say it was because they found the plans impracticable, and that the arrangement of the plans called for so great an outlay that it rendered it too expensive for them to be carried out and adopted, and they say that that was on account of the mistake of the plaintiffs in not properly advising them and in deceiving them as to the practicability of the plans.

Now, gentlemen, in determining the rights of the parties it is well to consider what the legal duty of the plaintiffs was to the defendants. The architect is skilled in the art of building houses. Those who employ him have a right to his best judgment, to his skill, to his advice, to consultations with him and to his absolute fidelity and good faith, and when the architect has contributed these things to the person who employs him his duty has been fulfilled.

Now in this case if these plaintiffs, taking the description of the lot from the defendants, and believing it to be feasible and best to advise a house with a square L, and in good faith they did so, and the defendants accepted the advice and relying upon it allowed the plans to go on and be finished to the minutest detail, then, gentlemen, the defendants have had a service for which they must pay. But on the other hand, if the plaintiffs deceived the defendants, and did not give them good and faithful service and advice, but knowing and having knowledge sufficient to warn them that a house of that sort would be impracticable and too expensive to be built, and withheld that information from the defendants and concealed it from them, and of their own desire and motive went on and built this house, leaving the defendants to find it out when completed, then, gentlemen, they cannot recover.

So, then, the question comes as to the first charge in this writ of 150 dols. for the plans and specifications for the first house. As the house was not built, it does not come within the schedule of prices contained in the slip that was handed to the defendants, and, therefore, it is left to the law to determine what the compensation shall be. And in such cases the law says that the compensation shall be a reasonable compensation. I do not know that the defendants deny that 150 dollars would be a reasonable compensation for the services, if they are compelled to pay it. If the learned counsellor denies that fact he can say so now; but I do not understand that he denies the reasonableness of the charge, but rather that the charge is illegal and that they are not required to pay it at all. So, gentlemen, take that consideration, under the instruction which I have given you and say whether or not these plaintiffs, taking into account the information which was given them by the defendants, taking into account their instructions, taking into account the defendants' views about it, and say whether or not they served them faithfully, honestly, in the exercise of good judgment, without fraud or concealment, without any attempt to compel the defendants to pay for a set of plans and specifications for a house that they knew were impracticable, and could not be carried out without unreasonable expense, and if you find that the plaintiffs were faultless in that regard, if you find that they acted in good faith and gave the defendants their best advice as to construction, skill and service, the defendants having taken it and accepted it, why then, gentlemen, the defendants must pay them a reasonable compensation for their service, which is admitted to be 150 dols., otherwise the defendants are required to pay them nothing. This is wholly a question for you to determine. The first plans and specifications were rejected some time in the month of April. I think that one of the defendants says that then he had a conversation with the plaintiffs about building him another house, and that they expressed a desire to do so, and I think he stated that he should be very glad to have them do so, and thereupon the plans and specifications for a second house were undertaken by the plaintiffs and carried forward to completion. After the plans were made they were accepted by the defendants and appear to have been satisfactory to all parties, and the building was placed under contract with a builder, whose duty it was to build and construct the house according to the plans and specifications. To this contract these plaintiffs are not parties. They are simply the servants of the defendants. They are required to give them their service, to follow their directions and do whatever they should direct to have done. The defendants might discharge them at any moment, or they might allow them

to continue. The plaintiffs, not being parties to the contract between the builder and the defendants, are not held bound by that contract, except in a general way, except in particulars that may perhaps be material and which I will mention hereafter.

You will notice by the terms of the contract that, as fast as the work progressed, the bills were to be submitted to these plaintiffs, the architects, who were to approve them, and when they were approved they were payable, and I understand that they were promptly paid. I understand that the house was built and that the defendants paid for it—for every nail, scantling, board, brick and shingle; that they have paid for the painting and the decoration, and that it is their house. The plaintiffs in this case have contributed nothing except their personal services. The house was to be built upon the land of the defendants, and when the house was completed and they had paid for it—paid for the material and labour—it necessarily became their house, and they could not reject it if there were faults on the part of the architects. They would not be required to do so, because it would be unreasonable to hold that, if the architects had failed to perform their contract faithfully, the defendants would be obliged to allow their house, costing upward of thirty thousand dollars, to remain idle and vacant until a lawsuit could be determined. They were not required to do that, so they moved into the house, and the plaintiffs are entitled to recover the schedule price for their services in preparing the plans and specifications and in supervising or superintending the building of the house. The amounts charged are not denied to be the schedule prices for that work, including the bill for travelling expenses, so that you need have no trouble concerning the items of the plaintiffs' account. They are indivisible, and no special assessment is required by you touching them, except so far as deductions may or may not be made from them as required by the instructions which I am about to give you. In the main the house seems to have been completed as the defendants had wished and intended; but the defendants say that the plaintiffs wilfully departed from their instructions, and wilfully built and finished it contrary to their explicit directions. In the first place, the defendants say that they directed the trimmings of the house to be of a particular colour. The plaintiffs deny this. They say that it was indefinitely left to them to choose the colour that would match certain other parts of the house, and give to it a proper artistic appearance.

Now, gentlemen, that is a question of fact. If the defendants specifically and explicitly directed the plaintiffs to paint the trimmings of the house a particular colour, and the plaintiffs understood those directions, it was their duty to follow them. It is the owner and builder of a house who has the right to say what sort of a house will please him, and what sort of a house shall be built, so long as he is able and willing to pay the expense of building it. But the plaintiffs say that this was left indefinite, and that they had no express instructions to put on the colour which the defendants contend they had, and this the defendants deny. That, gentlemen, is a question of fact. Are you satisfied, from the evidence, that the defendants expressly ordered the plaintiffs to put a particular colour upon the trimmings of that house, as they say they did, or does the evidence fail to satisfy you of that fact? If you find that the plaintiffs had specific directions as to the colour which should be put upon the house and, notwithstanding that, wilfully violated those directions to please themselves, because they thought a different colour would be better, then, gentlemen, the plaintiffs are in fault, and the defendants, having changed the colour to suit themselves and paid therefor the sum of seventy-five dollars, have a right to charge that against the plaintiffs' bill. So that, in regard to that matter, if you find that the paint was put on there in disobedience of the defendants' orders by the plaintiffs, then you may deduct from the amount the plaintiffs are entitled to receive the cost of changing it. But, on the other hand, the plaintiffs may have had talk in regard to these colours, may have advised about it, may have held out various considerations, and the defendants may have thought about it, and if the plaintiffs did not understand that they had specific and explicit directions, but that they had only received advice and suggestions, and they in good faith followed out their own best judgment about it, without wilfully violating the orders of the defendants, why then, gentlemen, even though the colour did not please the defendants, it is no defence to this action, and they must fail so far as that part of the case is concerned.

In the next place, the defendants say that the plaintiffs constructed the sashes of the French windows in express violation of their orders and directions. Now, gentlemen, how was that? The plans definitely and distinctly show the kind of French windows that were to be built and furnished. You will have with you the plan. That shows that the windows originally put into the plan and into the blue prints were exactly the same kind of French windows that were put into the house by the plaintiffs. I do not think that either party questions that fact. But the defendants say that after the plans were

made, and while one of the plaintiffs was at Bar Harbour, they called his attention to certain sashes in another house and directed him to have their sashes made like those shown. The plaintiffs say they do not remember any conversation of that sort, but they may have been asked as to whether the windows would be like those or not, but they do not remember definitely about it.

Now, gentlemen, the same considerations come in here that came into the other case. It is always well for the owner of a house, in matters of this sort, where the contract and specifications are in writing, to bear in mind that the architect, likely enough, has many jobs on his hands and many buildings under his control and is very likely to forget and omit specific directions, and if he wishes his architect to make changes, it is always well, if he wishes to give specific directions and to hold the architect to them, to give them in writing. The owner is not required to do so, but it is well that he should. This was not done in this case, and you will determine whether or not the plaintiffs, in following out the plans that had been given them and putting in the windows exactly as the plans and drawings required, violated the express orders and directions of the defendants, or whether, in good faith, they followed out what they supposed were his wishes and directions as expressed in the plans, and had not in mind any specific directions more than mere conversation or inquiry about it. It is just the same in this as in regard to the paint. Now, the testimony is (and I think it is undisputed), that for the changes made in those window-sashes the defendants paid 65 dollars. Well, gentlemen, if that was paid on account of the plaintiffs' wilful disregard of the defendants' orders, it may be deducted from the account. But if it was only required to be paid because the plaintiffs made a mistake about it and they built the windows in good faith, that was all that they were required to do, and if the defendants saw fit to change them afterwards they must pay the expense of doing it.

Now there are two other considerations which are of the same character, the dormer windows and the dining-room. The blue prints, or the original plans of the house, call for dormer windows apparently to be 2 feet 11½ inches from the floor. That plan the defendants had had and accepted, and they had reason to expect that the windows would be built at that height. The contract contains in substance a permission on the part of the defendants that the architects may make some changes, as they may think desirable, in the construction of the house, and therefore even though the blue prints called for these windows to be built 2 feet 11½ inches apparently, yet in the absence of more specific instructions from the defendants, if they in good faith thought it advisable and best, in the exercise of their best judgment and discretion, to raise the window-sills 7½ inches, and they did so, then, gentlemen, that would not prevent their recovery in this case. But if, on the other hand, they had received instructions to make the windows low and, knowing of these instructions to make them low, they deliberately and purposely went to work and made them high for some particular reason of their own, then, gentlemen, they violated their duty. You will take into consideration the probabilities of the case; you will take into consideration the motives which the plaintiffs would or would not have in doing a thing of that sort. In answer to an inquiry of mine it was stated by one of the witnesses that there were no architectural reasons why the windows should be raised—that it was not necessary that they should be raised on account of any architectural defects. Consequently, if that was so, the plaintiffs would have no reason to raise them simply to give a better appearance to their own work.

Now the plaintiffs say that, although the blue prints call for the windows to be 2 feet 11½ inches, they received specific directions from the defendants to make the windows high, and that they thereupon, in making their frame-plans, marked them up 7½ inches, and that the house was built with these windows 7½ inches higher than the original plans called for. Now, the defendants say that was done in direct and distinct violation of their orders. The plaintiffs say that it was not; that their instructions were to make the windows high. It is argued to you that they would have no motive in departing from the instructions, and it is argued to you that they exercised their own good judgment and good sense in determining where it was best to place those windows. On the other hand, the defendants say that they were told explicitly to make them low. Now, gentlemen, that is wholly a question of fact for you, and you will determine whether or not the plaintiffs deliberately and wilfully increased the height of those windows in violation of the defendants' instructions.

The dining-room was to be oval in shape. A controversy has arisen as to whether it was so built. The plans and specifications do not show what kind of a ceiling the dining-room was to have. It is conceded by all parties that the room was to be broken upon the floor by a fireplace and chimney; they were to break the exact oval of the room. The plans show that. So far the intent of the parties is plain and easily to be understood. Now, the defendants say that they expressly told the

plaintiffs that the chimney-breasts should disappear at the lower point of the cornice in the room so as to give them an oval ceiling, and that they required it made so. They say that that was their express and explicit direction to the plaintiffs. On the other hand, the plaintiffs say that it was suggested to them, or that they suggested it to him. I do not think it is of any consequence from what source the suggestion came. The plaintiffs say that, having that in mind, and either from the defendants' suggestion that they would like to have an oval ceiling, or from their suggestion to him that it would make a very handsome room if it could feasibly be done, they made studies and sketches; that they went so far even as to make sketches that were finally submitted or shown to the builder, to the contractor, but the plaintiffs say that those plans were never adopted by the defendants; that they were only shown to them to see how far the idea could be worked out, hoping to do it if possible; that finding it impracticable, and feeling that the defendants would hold them responsible for having a chimney of a proper draught, and to avoid its smoking, they were unwilling to recommend it and to adopt it, and therefore they made the room as it is now made by carrying the chimney straight upward. Now, gentlemen, if the contention of the plaintiffs is the true one, and they and the defendants considered the feasibility of making this room in that way—if they talked about it and had conferences about it and made sketches of it, and finally it was left to the discretion of the architects to determine and they did determine to build it as they did—they were justified in doing so. If, on the other hand, as the defendants contend, they had specific instructions to build it the other way, and to have the chimney disappear below the lower edge of the cornice, it was the duty of the plaintiffs to build it so. It was the defendants' house. They were willing to pay the bills, and they had the right to have the dining-room, or any other room, built in any way they were willing to pay for, and it was the duty of the plaintiffs so to build it. But if, on the other hand, from the conferences and the talk between them, the plaintiffs were led to believe that they had no express or positive orders to so build it, but were only required to build it if it met with their approval, if it became feasible and would, in their opinion, give good results, why then, gentlemen, if they saw fit to exercise their own judgment, and did so in good faith, even though the defendants are displeased with it, it is no bar to the recovery of this case.

Now, gentlemen, the dormer windows and the dining-room come under the same consideration, in one aspect, that the paint and the French windows do, except that in the first two instances the defendants made the changes themselves and paid the bills. Now, in regard to these other two items, the dormer windows and the dining-room, I instruct you, as matter of law, that if the plaintiffs wilfully, disregarding the positive orders of the defendants, built the dormer windows high when they were directed to build them low, and built the dining-room with a broken oval in the ceiling when they were directed to give it a perfect oval, and if the violation of those orders has substantially injured the elegance, comfort, utility and value of the house, then the plaintiff cannot recover at all, because a man cannot be allowed to wilfully disregard the orders and directions of his employers, and then compel his employer to pay for the service. But, on the other hand, if any of these deviations were honestly and fairly made, and were not wilfully done in violation of the orders of the defendants, even though it did not come up to the contract or to the directions of the defendants, then, gentlemen, all that the plaintiffs would be required to do in such case would be to make the defendants whole, and the defendants, for any shortcoming of that sort on the part of the plaintiffs, would be entitled to have deducted from the bill the difference in value between the house they have got and the house they would have had if the architects had performed their duty according to their directions and requests. So you see that that question turns explicitly and directly upon whether there was any failure on the part of the plaintiffs to follow directions, and if there was, whether it was wilfully and purposely done in direct violation and disregard of the defendants' orders. In the one case, as touching these two last items, it bars their recovery altogether, and in the case of the first two items, the paint and the French windows, it allows them to be deducted from the bill, because the changes have been made and it is ascertained exactly what the damages would be. But if there was no wilful violation on the part of the plaintiffs, and they carried out the defendants' directions to the best of their knowledge, with discretion and skill, in the construction of this house, even though they may not have conformed to all the directions and requirements of the defendants, yet they would not be barred from recovery of their bill, but could only have deducted from their bill the amount which the defendants had pecuniarily suffered, and which would be the difference between the house as now built and the value of the house as it would have been had it been otherwise built, or built according to the requirements.

Now, gentlemen, there is one other consideration. It appears that in the contract there was included a stable, and

the plans and specifications were to cover the stable, and that some plans and specifications were furnished. It appears that a stable was built by the defendants, and the defendants contend that, inasmuch as certain framing plans or specifications concerning the stable were not furnished to them, which came within the duty of the plaintiffs to furnish, and for which they had paid, and which were refused to the defendants, that the plaintiffs cannot maintain this action. Gentlemen, that is not the law. They can maintain their action; but it was their duty to furnish the framing plans and specifications touching the stable; it was their duty to do it; they were paid for doing it. Now it does not appear that any of the work was delayed, or that a stable was not allowed to be built on account of the non-receipt of any of those things. It appears that the plaintiffs' bill concerning the stable was paid by the defendants. So, gentlemen, in that regard I instruct that the plaintiffs were bound, before they received their whole pay, to furnish all the necessary details and plans for the stable, and if they refused to furnish them, then, gentlemen, you must deduct from their bill such sum as you think, from the evidence, the plans so refused were reasonably worth. If, on the other hand, the defendants accepted the plans and did not call for the specifications, or waived them, and settled the bill, and made no claim on that account, and the settlement included all the controversy in regard to the stable, that is an end of the claim, and you will not concern yourselves about making any deduction for their failure to furnish specifications in regard to the stable. Otherwise you have the right to consider it, and to make such allowance as you think the plans that were so refused by the plaintiffs to have been reasonably worth.

Now, gentlemen, if you find a verdict for the plaintiffs you will add interest from the date of the writ. In regard to the rough-cast, that was left to the architects to decide, and their decision must be binding upon the defendants. It is not contended here that there was any such failure on the part of the plaintiffs in regard to the rough-cast as would change the result of this case.

There are one or two things that have been suggested to me that I may have omitted, and that is in regard to the dormer windows and the dining-room. I supposed I had stated to you (I will do so now at any rate) that if they were built by the architects in the exercise of their own good judgment and discretion, and not in the wilful violation of orders, why then the defendants have no claim on that account if they were built as ordered.

Then it is suggested to me that I told you that a plan was submitted to Mr. Hodgkins for consideration by him. I do not know that I said so, but if I did so state you have heard the evidence as to what the plan was submitted to him for. I did not mean to preclude you in any way about that, and I do not know as it is material. I did not intend to say to you that the plan was submitted to him to determine anything, because I do not know that it was.

I am requested by the learned counsel for the defendants to instruct you that—

"If you find that the house was not built in accordance with the defendants' instructions to the plaintiffs, and such departure was the result either of the negligence or wilfulness of the plaintiffs, then there shall be deducted from the amount that would otherwise be due to the plaintiffs whatever damage the defendants have suffered on account of the departure."

Yes, gentlemen, I give you that instruction.

The jury gave a verdict for the architects, on all points.

WILTON HOUSE.

THE members of the Newbury District Field Club visited Wilton on the first excursion of the season. After seeing the Carpet Factory, Almshouses, Fugglestone Church, Wilton House, the home of the Herberts, was reached. The mansion, which stands in a fine park, says the *Reading Mercury*, consists of an extensive pile of buildings erected at different periods and in various styles of architecture. It has engaged the attention of several eminent architects, the original designer being Hans Holbein. When his pile was injured by fire the restorer was Inigo Jones, and his son Webb, who were employed in enlarging or embellishing it, and later on Wyatt was engaged, and designed an enclosed or glazed cloister for the reception of the valuable works of art which the owner had collected; also a large courtyard on the north and a new side to the house. In the opinion of Sir Richard Hoare the work of Mr. Wyatt was not attended with the most satisfactory results; in short, the building cannot be said to belong to either of the great men mentioned. A specimen of Holbein's architecture, however, still exists, a porch and gateway of strikingly beautiful proportions, containing two series or stages of pillars, one above the other, as well as recesses with busts. Architecturally Wilton House is not to be compared to Castle Howard or some of the other great mansions which make our English noblemen appear like so many lesser sovereigns on their own domains, but in its associations

Wilton surpasses nearly all of them. The grand entrance hall, for instance, and cloisters, the latter extending round the four sides of the noble pile, contain several hundred pieces of ancient sculpture of incalculable value, and suits of armour of fabulous worth. The pictures in this splendid collection are not less valuable than the sculptures, consisting as they do chiefly of the works of Reubens, Vandyke, Spagnoletto and Parmegiano, a portrait of Titian (by himself) and a large family piece in the drawing-room, by Vandyke, of Philip, Earl of Pembroke, with his countess, Susan, daughter of the Earl of Oxford, and their five sons and daughter Anna Sophia, and her husband, the first Earl of Carnarvon. This nobleman, who is represented as attired in cavalier costume, fell in the battle of Newbury. As many of our readers are aware, the Pembroke family is related to that of Carnarvon, and we were informed that had the late Earl of Pembroke died without male issue, the late Earl of Carnarvon would have succeeded to the estates. Genealogists deduce the origin of the Herbert family from a natural son of Henry I., whose descendant William, son of Sir William ap Thomas, was created first Earl of Pembroke, and being warmly devoted to the Yorkist party, was beheaded by the Lancastrians after the battle of Edgecote, where he had been taken prisoner. His son William, the second earl, had for his third wife Mary, sister to Sir Philip Sydney, on whom Ben Johnson wrote a beautiful epitaph. The third Earl William, called by pre-eminence the Earl of Pembroke, was a truly illustrious character. The visitors having been received in the hall, were successively conducted through the cloisters, the Gothic hall, where, through a break in the wooded scenery of the park, a delightful glimpse of the graceful spire of Salisbury Cathedral was seen; the colonnade-room, the breakfast-room, containing a fine portrait by Richmond of the present holder of the title, George Robert Charles, the thirteenth earl; the library, from which there was a fine view of the terraces and Italian garden, with the lovely walk, terminating with the Italian summer-house, containing a replica of Shakespeare's statue at Stratford-on-Avon; the dining-room and other apartments, all more or less magnificently adorned with painted ceilings and elaborate cornices. The visitors were conducted through the reception-rooms in small parties by the housemaids who were in charge of the mansion, the earl and countess being at their town house, and it was a matter of disappointment and regret that no one was in attendance capable of imparting some reliable information in reference to the multitude of fine art treasures which met the eye at every turn. The visitors were literally hurried through the mansion, where much more time might have been spent to the advantage and pleasure of all. On their departure they were met by Mr. Challis, the head-gardener, who has been in the service of the family for thirty-five years, and who conducted the party through the delightful grounds, pointing out various objects of interest, including trees planted by the late Emperor of Russia prior to the Crimean War, and by other distinguished personages. The park contains a fine herd of deer, and it is timbered with a great variety of valuable trees, including elms equalling those in the precincts of Eton College, brown beeches, noble oaks, wide-spreading cedars, grown from saplings brought direct from Lebanon, and the evergreen oak, known as ilex, the latter probably three hundred years old. It has suffered much damage from frost and tempest, and its branches are now held up by timber supports. Through the park run two streams, the Nadder and the Wiley, both of which fall into the Avon near the adjacent cathedral city. Spanning the Nadder in its winding through the park is an elegant Palladian bridge of Classic appearance, from which were espied some splendid trout. The tour of the grounds was made in the face of drenching rain; still, with such an intelligent and communicative guide as Mr. Challis, there was no lack of interest. Mr. Challis explained that when, in compliance with the wish of the present countess, some excavations were being made close to the river front of the mansion with the object of planting some climbers, two tombs of great antiquity and interest were unearthed, and they are now preserved in one of the Italian summer-houses in the park. Crosses are carved on each. One tomb is of the eleventh century and one of the thirteenth century. They probably marked the site of the burial-place connected with a nunnery which stood on the spot now occupied by Lord Pembroke's house, founded far back in Saxon times. A ruin of the original buildings and a window of great antiquity were pointed out. On the dissolution of the monasteries, the lands were conferred by Henry VIII. upon Sir Wm. Herbert, afterwards Earl of Pembroke.

The town hall was afterwards visited. The ancient charters, the gold maces, and other civic insignia were exhibited and inspected with much interest. We were informed by the Mayor that Wilton is one of the oldest corporate boroughs in the country, and is only surpassed in its antiquity by Winchester, London and York. Its first charter was granted in the year 1100, prior to the laying of the foundation-stone of the magnificent cathedral at New Sarum, which took place in 1220.

The town is situate in a fertile vale at the confluence of the Nadder and the Wiley, three and a half miles from Salisbury, and is called by some old writers Vilodunum and Ellandunum, and by Baxter Caer Guilon, or the chief seat of the British Prince Carvilius. However this may be, it is undoubtedly a place of great antiquity from which the county derives its name, and it was probably a chief town and residence of the West Saxon kings, who conferred upon it many substantial marks of their favour, such as founding religious establishments, constituting it a royal borough, and investing it with many extraordinary immunities. King Alfred defeated the Danes here in 871. The place was particularly famous for its abbey, which was instituted in 773 by Wulstan, Earl of Wiltshire, on the occasion of his having defeated the Mercians, who had put to death his father Alquimond. About the year 800 it was converted by Egbert into a nunnery, and in 871 Alfred transferred the religious, whose number he augmented, to a new establishment.

OSCOT COLLEGE.

ON Saturday forty-five members of the Midland Institute and their friends drove in open carriages to Oscot College. They were there met by the Rev. Dr. H. Parkinson, the Rev. Canon Greaney, and the professors and gentlemen resident at the college. The party were divided into six groups, and placed under the care of as many gentlemen, who led them by different routes through the principal apartments. The buildings were erected, says the *Birmingham Post*, by the elder Pugin about the year 1836. They are in the style which prevailed in collegiate and domestic buildings towards the end of the fifteenth century, and are arranged round a large central quadrangle; the details are extremely simple throughout, but the large and lofty structure, relieved by a massive tower, has great dignity of effect, and, standing as it does on an elevated and exposed site, forms a predominating feature in the landscape from several directions. The chapel is a conspicuous feature, and, though perhaps somewhat lacking in dignity, is very pleasing and attractive. The magnificent reredos is decorated with paintings and Limoges enamels, and the effective colour decorations of the walls and arches compensate for the rather bare character of the architecture. There are several chapels. The apartments which formed the chief attractions were the library and museum. Only those of the party who had previously been through these departments could have had any idea of the extent and value of the collections. Many of the illuminated manuscripts were each worth a much longer journey than to Oscot. One small volume of the thirteenth century of remarkable caligraphy and exquisite miniature painting, all in wonderfully good preservation, had whole page drawings of apostles and saints of great excellence of drawing and of colour, the latter remaining nearly as bright as it was six hundred years ago. The manuscripts are a fine series extending from the thirteenth to the sixteenth centuries and form a valuable means of studying the gradual changes of style, and the series is continued in early printed and illustrated books, the binding alone being in many instances of rare beauty and excellence. The embroidered vestments, from the thirteenth to the seventeenth centuries, are exceedingly fine; many of them belong to St. Chad's Cathedral, but it was quite impossible during the time allotted to see a twentieth of the treasures of the library. The same may as truly be said of the museum, to which the party were next conducted. The nucleus of the museum was formed by Pugin, and consisted to a great extent of small carved Mediaeval statuettes of wood, many in good preservation and containing much of the original painting. There are also figures in stone and alabaster, many very exquisitely carved, painted and gilded triptychs, and other work in wood and metal. An exceedingly fine bronze eagle desk, with statuettes, pinnacles and other architectural adornments, is perhaps the chief object of the collection. This was presented to St. Chad's Cathedral by Henry, Earl Shrewsbury. It is probably the finest thing of its kind in the world. A small wrought-iron receptacle for burning a charcoal fire is made to represent a fortress, with towers, bastions, drawbridges, gates, &c., an extremely curious and interesting work. A crucifix, carved out of a very large single piece of ivory, is one of the great treasures of the college, and originally belonged to the Emperor Napoleon. Much of the church plate is very fine and valuable. Before leaving the visitors partook of light refreshments, and a vote of thanks was proposed by Mr. J. A. Cossins to the Bishop of Birmingham, Canon Greaney and Dr. Parkinson for the privilege of visiting the college, and to the gentlemen who had proved such intelligent and courteous guides.

Colonel Charlesworth, M.P., has given 250*l.* towards the restoration of Grinton Church in Swaledale. The renovation will cost some 2,000*l.*, and already nearly 1,000*l.* has been raised.

GENERAL.

The French Government have subscribed 1,000*l.* towards the cost of finishing Turner's *Ancient Italy* for the Louvre.

The Plans by Messrs. Cooper & Howell, of Reading, have been adopted by the Reading Town Council for the extension of the Free Library and Museum Building. The plans by Mr. W. G. Lawton obtained the second prize.

Herr Palmie, the Munich painter, has patented a packing-case, which he claims will afford security against injury for all paintings enclosed in it. A company will be formed for the manufacture of the cases.

Mr. Robert Walker, of Windermere, has obtained the first prize in the competition for a Board school in Lancaster.

Sir Henry Oakley, general manager of the Great Northern Railway, is shortly to be presented with a life-size portrait of himself as a memento of over forty years' connection with the company. The cost of the work has been subscribed by the officials of the company in every grade of the service.

The Bradford Society of Architects and Surveyors contemplate making a two days' trip over the Manchester Canal in the month of July.

Major Seymour Leslie, R.E., read a paper on "The Threatened Temples of Philæ" at the meeting of the Society of Architects on Tuesday, a report of which will appear next week.

The Annual Excursion of the Architectural and Archaeological Society of the counties of Lincoln and Nottingham has just been held in the neighbourhood of Horncastle, a number of interesting Lincolnshire churches being visited.

The Glasgow Archaeological Society have passed a resolution deprecating the removal of the Tron Steeple, which, erected about 1637, has been for over 250 years one of the best-known and most picturesque landmarks of the city.

Mr. H. M. Townsend, architect, has written a letter to the *Standard* alluding to the dangerous condition of Fotheringay Church. "The present incumbent," he says, "feels the greatest interest in the church, which, besides its historical value, is full of architectural beauty, and I hope that the attention now called to the matter may result in his receiving some assistance towards preserving the remains of a noble church with a deeply interesting history."

The Olympic, which has never been a success as a music-hall is to be re-offered for sale. The original building was known as the Olympic Pavilion, but this being burned down in 1849 the present structure was erected. The auditorium is said to accommodate 3,000 persons, and the stage is in size second only to that of Drury Lane. The whole covers an area of 14,000 feet superficial, with frontages to Wych Street and Maypole Alley.

A British Committee, of which Sir Douglas Galton, K.C.B., F.R.S., is the chairman, and Professor W. H. Corfield, M.A., M.D. (Oxon), is the treasurer, has been formed to further the interests in this country of the eighth International Congress of Hygiene and Demography, which is to be held in Budapest from September 1 to 8 this year.

The Death is announced of M. Federico Madrazo, the Spanish painter, at the age of seventy-nine. At his death he held the high position of Director of the Academy of the Fine Arts, and of the Museum of Painting in Madrid.

The Tower Bridge was inspected yesterday by the members of the City of London Corporation.

A Sum of 3,000*l.* has been received in aid of the building fund for the new church of St. Aidan, for Walton and Bamber Bridge.

The Sale of the seventeen paintings belonging to M. Tavernier, which were on view last week at the Petit Gallery, in Paris, brought a total of 12,160*l.* The one that sold best was M. Eugène Delacroix's *Entombment*. It was knocked down at 3,520*l.* The *Laundresses Washing in a River* of Daubigny fetched 2,720*l.*; *Arab Horsemen Crossing a Ford*, 840*l.* (Delacroix).

Wetton Village Church was reopened yesterday (Thursday). Messrs. Wm. Sugden & Son, of Leek, were the architects, and Mr. J. W. Bassett, of Hulme End, the builder.

"Gog - Magog Hills," the celebrated Cambridgeshire estate of the Duke of Leeds, is in the market. It comprises a fine mansion within the famous Roman entrenchment known as Vandlebury, 250 feet above the level of the sea, and close on 500 acres.

The Site of Her Majesty's Theatre in the Haymarket, which was intended to be utilised for an American hotel, is to be brought to the hammer early next month. It is stated that an attempt will be made to secure it for the erection of a grand national opera house.

The Transactions of the British Association for 1893, embodying the report of the Nottingham meeting, have been published in a volume of over 1,000 pages. The publisher is Mr. John Murray.

The Architect.

THE WEEK.

AS MR. WILLIAM CALDER MARSHALL was one of the "Honorary Retired Academicians," his name had become unfamiliar to modern amateurs. At one time he was the strongest of FOLEY's rivals, and from his studio in Ebury Street, which he occupied for over half a century, a great many works were turned out. His *Sabrina*, which was made popular by a porcelain copy, was a graceful figure, and by many it is considered his representative work. His statues of CLARENDON and SOMERS in the corridors of the Houses of Parliament displayed ability to model figures of men, and his *Agriculture*, which forms part of the Albert Memorial in Hyde Park, is also effective. The statues of PEEL in Manchester, of CROMPTON in Derby, of JENNER in Kensington Gardens, are among his works. In the competition for the Wellington Monument he obtained the highest premium of 700*l.*, but he was not entrusted with the commission. The panels which he executed in the chapel where STEVENS's monument used to stand were not compensation for the loss of the greater work. MR. MARSHALL was born in Edinburgh in 1813, and there he received his earliest instruction. When he came to London he was employed by CHANTREY and E. H. BAILEY. The influence of both Academicians is visible in his figures. In 1844 he was admitted an Associate of the Royal Academy, and in 1852 he was elected Academician. Sculpture can only attract limited patronage in England, and it was creditable to the late W. C. MARSHALL that he was persistent in producing conscientious work alone.

THE artists who have possession of the surviving buildings of the last international exhibition in the Champ de Mars are likely to suffer inconvenience before long. It was intended at one time that their galleries should not be affected by the laying-out of the ground for the buildings of the international exhibition which is to be held in 1900. But that arrangement has had to be altered. A meeting of the sub-commission charged with the preliminary operations was held on Monday, when it was decided that the Eiffel Tower is alone to have a guarantee of preservation on the Champ de Mars, and the Trocadéro buildings are to be also respected on the opposite of the river. With the two exceptions the competitors for laying out the grounds and designing the buildings are to have the fullest liberty in dealing with the site. It is probable, however, that many of the competitors will believe in the prudence of allowing the existing galleries of fine arts to remain. Prizes amounting to 4,000*l.* are to be awarded for the designs.

M. ALFRED HENRI BRAMTOT, who died a few days ago at Garennes in his forty-first year, was one of those painters who are indifferent to the applause of the crowd. His *Departure of Tobias*, which was reproduced in *The Architect*, exemplified his aims. He wished to represent biblical scenes of the same class in a manner that did justice to their idyllic character, and was yet most reverential. His treatment was the more remarkable, as M. BRAMTOT won the Prix de Rome in 1879. He was a native of Paris, and studied under M. BOUGUEREAU. In order to secure independence of the market, and do justice to his talent, M. BRAMTOT occupied a great part of his time in teaching. He was one of the professors in the Académie Julian and in the Ecole Polytechnique.

ANOTHER of the veterans of English architecture has passed away. MR. JAMES MEDLAND died at Gloucester on the 18th inst., at the age of eighty-six. The son of an architect in practice in London, he came to Gloucester as chief architectural assistant to the late MR. S. W. DAUKES, remaining in that position when the practice was continued by DAUKES & HAMILTON. When MR. DAUKES left Gloucester for London, the firm became HAMILTON & MEDLAND. MR. HAMILTON subsequently left MR. MEDLAND in sole possession. After some years he was joined by MR. MABERLY, and, on MR. MABERLY's retirement, by his son. MR. MEDLAND held for many years the office of county

surveyor. Since the office was first opened in Clarence Street by MR. DAUKES a great many buildings, some of them large and important, have been carried out. In the list are comprised lunatic asylums, workhouses, cemeteries, public halls, hotels, markets, churches, chapels, police-stations and petty sessional courts, mansions and smaller dwellings, workmen's cottages and sundry other buildings. In the designs of all of them MR. MEDLAND took the chief part. His eldest surviving son, HENRY, is still in practice in Gloucester. A younger son, JOHN, is a member of the firm of MEDLAND & POWELL, and was for several years one of the late Sir G. G. SCOTT's managing assistants and chief draughtsmen.

THE advantages of Bexley Heath, in Kent, for suburban residences, on account of its healthiness, picturesqueness and accessibility from London, are strangely overlooked. If it had been remote from the metropolis, instead of being twelve miles distant, its scenic beauty would have found countless admirers. It is to be hoped the small book entitled "Bexley Heath considered with regard to Health," by DR. O. SUNDERLAND, the medical officer of health (published by T. JENKINS), will receive the attention which the subject deserves. Many of the suburban districts are overcrowded, and it is a public benefit to possess one which for nearly a century has possessed a reputation as a health resort, and which, as DR. SUNDERLAND explains, is not due to accidental causes. The ground consists of beds of sand and gravel resting on chalk, averaging 130 feet in depth, and fogs are almost unknown. The rainfall is diminished mainly by the influence of Shooter's Hill, and there is protection against northerly and easterly winds. According to DR. SUNDERLAND, "Bexley Heath possesses a climate suitable for all persons who require a bracing atmosphere and a dry soil." That the district has a curative effect on many diseases has been repeatedly demonstrated. The illustrations are evidence that what is said about the picturesque charms of that part of Kent is not exaggerated.

THE grouping of the contents of an international exhibition is no easy task, and various systems have been adopted since 1851. In the Paris exhibition of 1900 there will be seventeen groups, which will be subdivided into 117 classes. The first will relate to education and teaching. The second will comprise works of art, including painting in oils and water-colours, engraving, lithography, sculpture, engraved stones, and lastly architecture, which will be again recognised as one of the fine arts. The third group will exemplify instruments and processes employed in literature, science and art, including photography, musical instruments, printing, theatrical properties, &c. Machinery in general will form the fourth group. The fifth will be devoted to electricity, which by the end of the century is certain to have reached a remarkable development. The sixth group will display examples and models of civil engineering and means of transport. Four groups will be required for agriculture. Mines and metallurgy will constitute the eleventh group. The twelfth will be an attractive one in France, as it will relate to the decoration of buildings and furniture. One of the classes will be formed of painted glass, which hitherto has had an uncertain position, being sometimes treated as a manufacture. The thirteenth group will comprise textiles and clothes. Chemical products will constitute the fourteenth group. The fifteenth and sixteenth groups will suggest the weakness of all classification, for one will contain industries, such as goldsmiths' work, cutlery, watches, which might be supposed to belong to some of the earlier groups, and the other will suggest sanitation. Finally will come arms—for without their aid there would be little safety for the works of peace which it is the object of an exhibition to exemplify.

AN illustrated volume entitled "Three Periods of English Architecture," by MR. THOMAS HARRIS, F.R.I.B.A., will shortly be issued by MR. BATSFORD. In the pages the author explains the growth of opinion amongst his professional brethren upon the necessity for some considerable advancement of their art in accordance with the necessities and spirit of the present day. He also dwells upon the advantages offered in our time for a new departure, such as many able architects have already indicated.

A HISTORY OF WESTMORLAND.*

FROM its physical conformation the Westmoringa land of the Saxons, which has been known at later periods as Westmaria, Westmeria, Westmerieland, Westmerland, the land of the western meres or lakes, Westmoreland and Westmorland cannot be remarkable for fertility, but it never lacked inhabitants. Probably the security it offered was considered to be an equivalent for the distances which separated the valleys that are covered with soil. In our time the picturesqueness of the greater part of the county has made Westmorland attractive for residential purposes, and the inhabitants can obtain supplies from distant regions. The agricultural fertility, therefore, does not count for much. For many centuries the people were compelled to rely on what was obtainable from the valleys and the hill-sides, which in primitive days must have been uncertain in quantity, yet there is evidence enough that many a contest was fought to secure the privilege of living among the northern mountains and near the lakes.

Ethnographic research has furnished evidence of a diversity of possessors, and reveals that in all times inhabitants had to make way for strangers who were stronger, better armed, more influential or wealthier. There was a long-headed race using stone implements who were supplanted by round-headed men who could fashion stone into more efficient weapons, and then came invaders who were armed with bronze javelins who would be irresistible—for a time at least. Memorials of these remote possessors remain, and the student of prehistoric archaeology will have enough subjects for investigation in Westmorland. Mr. FERGUSON in the course of his chapter on the early inhabitants says:—

The round barrows and cairns of the brachycephalic men are numerous in Westmorland, and are found on almost every fell. Several in the parishes of Kirkby Stephen, of Warcop, of Asby, of Crosby Garrett, of Ravenstonedale, of Orton, of Crosby Ravensworth and of Askham have been excavated by Canon Greenwell, who has put on record the results. Cairns abound upon Moor Divock, the high plateau between the foot of Ullswater on the west and Helton Flecket on the east. The late Dr. M. W. Taylor, F.S.A., of Penrith, was the first to call attention to the existence among these of "starfish cairns," or cairns with projecting rays like the arms of a starfish. The conjecture is that the projecting rays cover secondary interments. Megalithic monuments, such as upright stones, or *menhirs*, stone circles and stone avenues, are common; such as the Kop stone on Moor Divock and the Guggleby stone at Shap, the stone circles and avenues at that place and on Moor Divock, the stone circles on Lowther Scar, at Crosby Ravensworth, at Leaset Wood by Clifton Dykes, at Gamelands, and elsewhere. Under the name of Carl-Lofts the megalithic remains at Shap have attained a reputation they are hardly entitled to. The country people tell legends of an avenue of *menhirs* extending from Shap to Moor Divock, a distance of at least seven miles. Pennant and Stukeley more modestly mention an avenue of one and a half miles, extending from the village of Shap into the precincts of Shap Abbey, and some modern antiquaries have laboriously amused themselves by endeavouring to reconstruct the "serpentine avenue" of Stukeley. But the Rev. W. C. Lukis, F.S.A., who surveyed in 1884 the megalithic remains at Shap on behalf of the Society of Antiquaries of London, thinks that this avenue had no existence on such a scale. Pennant's account is based, he shows, upon that of Stukeley, who visited Shap on a rainy day in 1725, in weather, therefore, by no means favourable to archaeological research on a bleak and exposed moor. From Carlisle Stukeley sent over to Shap a young and inexperienced surveyor named Routh, who in one day (an utter impossibility) made a plan of the Shap megalithic remains, which cannot now be found among the Stukeley papers. Mr. Lukis, who edited the Stukeley papers for the Surtees Society, concludes that the serpentine avenue from Shap to Shap Abbey is due to the vivid imagination of that ancient antiquary. Further, Mr. Lukis, after a careful survey of the existing remains and due consideration of the evidence as to what has disappeared, is of opinion that Shap was a necropolis extending over a considerable area, and that there may have been single and double rows of stones, but not necessarily as part of a specified system. Moor Divock would seem to be also a necropolis on a large scale, and the same might be said of the vicinity of Crosby Ravensworth. Several stone circles, known on undoubted evidence to have existed in various parts of the country, have disappeared under the ravages of the builder, the agriculturist or the roadmaker.

The early inhabitants also found it was necessary to protect the living as well as to preserve the memory of the dead. Round or oval camps and enclosures are met with which date from Neolithic days. On Moor Divock there is a circular space 68 feet in diameter, which is entirely paved with water-rolled stones. Similar pavements have been found in Algeria. It is supposed that at least three

aces, a pre-Celtic and two Celtic, had occupied Westmorland prior to the coming of the Romans, but where they came from and how long they remained have yet to be ascertained. The Brigantes who are referred to by PTOLEMY are supposed to have inhabited Westmorland, besides Cumberland, Northumberland, Yorkshire and Lancashire, but whether they formed a tribe or combination of tribes can only be guessed. Apparently in CÆSAR'S time the people in the north were less civilised than those in the south.

The northern tribes were on that account not easily converted to a belief in the advantages of the improved systems of government and life introduced by the Romans. It was necessary to erect earthworks and fortifications to protect the strangers and the Britons under their rule. Westmorland could not be omitted or neglected by the Roman engineers, but it does not appear as if that district possessed much importance on its own account. As Mr. FERGUSON says, the Roman stations in Westmorland were few, and if compared with those in Cumberland were unimportant, for "they covered no frontier, like the stations on the line of Hadrian's Barrier, they protected no harbours, like those that studded the Cumbrian coast of the Solway. Their duty was to guard the lines of communication between these frontier posts and ports and the military basis of operations, whether that basis was at Chester as in the early days of the Roman dominion, or at York, as in the latter days."

A long period followed the Roman occupation, which is not represented by constructive works in Westmorland. There is a tradition about UTHUR PENDRAGON, the father of King ARTHUR, having a house at Mallerstang, "where heavy earthworks denote something earlier than the small Norman keep now in ruins," but only a poet could attach importance to either the tradition or the remains. There were many fierce struggles in and around Westmorland, which Mr. FERGUSON does his best to explain. For nearly five centuries it was alternately Saxon and British or Welsh, according to whatever power was temporarily uppermost. The condition of that part of the country at the time when the Domesday Survey was prepared is suggested by an entry relating to about fifty villages in the hundred of Amounderness, which says, "Of these, sixteen have few inhabitants, but how many inhabitants there may be is not known; the rest is waste." WILLIAM RUFUS in 1092 took possession of Westmorland with the rest of the land of Carlisle, and he displayed more wisdom than might be expected from him, in imitating the Romans by raising constructive works to guarantee security.

The first care of the English king was to make his dominions safe against invasion from Scotland, and to secure the great road from York to the north over the pass of Stainmore. This he did in the most approved fashion of the day. The military engineers who served his father had introduced from Normandy the fashion of building castles in stone, with, where the ground was firm enough to carry the weight, great square keeps within their enceinte; the Tower of London is the finest example thereof in England. For the erection of such keeps the waste chert or camps of the Romans offered facilities of a high order—their strategic positions, selected by men who thoroughly understood the art of war; the rich quarries their abundant ruins presented of hewn and wrought stone all ready to hand, and the firmness of the ground, consolidated by long lapse of time, on which they stood. The "burhs," or great earthworks, with which the thanes or franklins, who preceded the Norman barons, had studded the land, were also well fitted for that purpose. For the defence of the great road from York over Stainmore William Rufus reared square Norman keeps on the Roman camps of Bowes in Yorkshire, of Brough-under-Stainmore and of Brougham in Westmorland, and of Carlisle on the sites of Roman *Lavatrae*, *Verterae*, *Brovonacae* and *Luguvalium*. Another of these square keeps he placed on the site of the "burh" of thethane or franklin of Appleby, and yet another on the "burh" of Pendragon, to guard the by-pass of Mallerstang. This chain of castles guarded the only road open for wheels from Carlisle and the West of Scotland into the heart of England, the great plain of York. A castle at Bewcastle stopped the Maiden Way on which, owing to the gradients, wheels could not be used. For the time this seems to have been thought sufficient; no Norman castle was built on the "burh" of thethane or franklin of Kendal; the Red King's advisers do not appear to have been apprehensive of an invader from either Scotland or Ireland landing on the Cumbrian coast and working south by the Roman roads to Windermere and Kendal; they seem also to have thought the impervious and roadless defiles of Shap required no fortifications. These castles were built by, or under the superintendence of, Flemish masons, of whom the Red King imported a considerable number, who probably remained in the country as settlers.

The Norman keeps were not only useful for the defence of a great road. Afterwards they became the models for

* *Popular County Histories: A History of Westmorland*. By Richard S. Ferguson, M.A., LL.M., F.S.A. London: Elliot Stock.

the much smaller peel towers, which were indispensable as residences during border warfare. The towers were so numerous that, as Mr. FERGUSON says, "It is a common remark at every archæological meeting in the county that the kernel of almost every 'hall house,' and of many an old farmhouse, in Westmorland as in Cumberland, is the lower storey of a peel tower, round which the rest of the building has gathered. . . . In some cases the peel tower makes no sign that the eye can see, and the curious archæologist has to search for its remains, probably the lower storey only, in the strong-room, the plate-closet, the ale-cellar or the dairy, where its existence is at once betrayed by the great thickness of the walls compared with more modern additions." Up to the fourteenth century the tower was sufficient for residence, then a hall was added as a distinct building; afterwards there was further extension, for during the sixteenth century mansions began to assume the form of ranges of buildings facing a courtyard. In some cases, whilst the old peel tower and dining-hall were retained, another tower in symmetry with the original one was added to the opposite end of the block, so as to give the form of the letter H. Owing to the fashion for absorbing smaller estates which prevailed among the LOWTHERS and other great families, "many manorial halls have come to the condition of mere farmhouses."

In Westmorland and Cumberland defensive requirements made it necessary to have courageous and trustworthy men in most districts. Hence it was probably that the "statesmen," *i.e.* estatesmen, or peasant proprietors, arose. They still form a remarkable class of men. People in the south were first made acquainted with their qualities by the writings of WORDSWORTH, SOUTHEY and JOHN WILSON. A bold peasantry like them may be their country's pride, but they can never be patrons of architecture. The dwellings have been considered as picturesque, especially when creeping plants cover the walls and flowers are in bloom in the gardens, but constructively they are very simple:—

The cottages of the dalesmen or "statesmen" were built of unhewn stone, sometimes without mortar, and roofed with rough slates; the woodwork throughout was of oak; the beams were made of whole trees roughly squared with the axe, while the smaller rafters and joists were split. The houses of the usual size contained, as a rule, only three rooms on the ground floor, viz. the kitchen or general sitting-room, the dairy and the parlour, where the master and mistress generally slept; stone steps gave access to the loft, an unceiled apartment, generally divided into two and used for sleeping; an outhouse or downhouse with set-pot, and a huge porch, completed the accommodation.

The dwellings of a people have a close connection with the history of the district containing them, and in those of Westmorland it is easy to perceive evidence of one of the qualities of the inhabitants, which was an indifference to external influences. The remoteness of Westmorland and the neighbouring region is indicated by the uncertainty of its ecclesiastical relations. At one time the bishops of Glasgow and Durham claimed to be the overseers of the souls of the inhabitants, at another time the barony of Appleby was part of the diocese of Carlisle, while the barony of Kendal formed part of York. HENRY VIII. placed the latter in the diocese of Chester. The people do not appear to have cared much about hierarchical arrangements, which was not surprising, for a large part of them were of Scandinavian race. Mr. FERGUSON has to admit (and it cannot be satisfactory to a diocesan chancellor) that "Westmorland is not very rich in religious houses: a house of Carmelites or White Friars at Appleby; a cell at Bleatarn, near Warcop, which was a dependency of the Cistercian abbey of Byland, in Yorkshire; and an abbey of Premonstratensians, or White Canons, at Shap or Heppe, as it was originally called, complete the list." There were enough churches in the old days, but the scarcity of abbeys was the sign of the absence of an element of organisation which was most powerful in the remainder of England.

If ecclesiastical authority was weak in Westmorland, one of the consequences was abnormal selfishness, which was seen in some of the great families. Mr. FERGUSON, after narrating the history of the CLIFFORDS, tells us they were "a race of singular energy, which found vent for itself in fighting, in adventure, in building, in litigation, in extravagance and gallantry, and frequently in rebellion against their sovereign," all of which actions caused sufferings to other men with which a historian is not expected to sympathise.

It is satisfactory to learn that there was a change of manners accomplished by bringing up the head of the house from a boy as a shepherd. In him, as WORDSWORTH says, "the savage virtues of his race, revenge and all ferocious thoughts were dead." As became a good man, the shepherd-lord "occupied himself in repairing and rebuilding his numerous castles." The hereditary impatience of the ordinary English life afterwards reasserted itself in some of his descendants. Among them was the famous Countess of PEMBROKE, who "spent in building operations 40,000*l.*, and when told that CROMWELL would pull her restored castles down, she declared that she would rebuild them as fast as he should destroy them." She was "High Sherifess" of the county, and was competent to fill a higher office. It was the Countess who was supposed to have written the famous curt reply to a Secretary of State after the Restoration when a Government candidate was proposed for Appleby:—"I have been bullied by a usurper, neglected by a court, but I will not be dictated to by a subject. Your man shan't stand."

With lords and ladies above them like the CLIFFORDS, it is no wonder the people were tenacious of the rights which they claimed to have held from the time of King BRUTE, and on any sign of interference were ready to cry out that the landlords intended "to pull their skin over their ears and bray their bones in a mortar," or to commit similar misdeeds. Combativeness was developed, and the wrestling and other athletic sports may be considered as forming a weak survival of the old spirit which was displayed in many moving accidents by flood and field.

It is one of the advantages of the series of county histories published by Mr. ELLIOT STOCK that each writer is allowed to realise his own theory of the character which should be given to his work. Mr. FERGUSON is a lawyer as well as an archæologist, and he is moreover enthusiastic about every trace of antiquity which can be revealed in Cumberland or Westmorland. His book is therefore well balanced. It is plainly the work of a man who finds pleasure in his investigations, but who submits to the restraints which laws of evidence impose. The statements in the pages may be accepted with confidence, and they are so disposed as to form graphic pictures of life in the north during several centuries.

A VISIT TO CLUNY.

IN the *Glasgow Herald*, Mr. Dalrymple Duncan, one of the secretaries of the Glasgow Architectural Society, gives the following account of a visit to the abbey of Cluny, one of the homes of architectural art:—

In travelling through France it is melancholy to see the condition into which a great many of the important architectural monuments of the country have been allowed to fall, and in most cases if the tourist asks an explanation he will be told with a shrug that the destruction took place in "Quatre-vingt-treize," for, like our own Reformation, the French Revolution is a convenient scapegoat on which to lay the blame of a state of matters due in numerous instances both in Britain and France to the neglect or the vandalism of municipalities or individual proprietors. The Reformation and Revolution have their own share of blame to bear, but it is unfair to charge them with acts of destruction for which they are in no way responsible. In France it is deplorable to think that the great abbey church of Clairvaux, after having passed unscathed through the troubles of the Revolution, the Directory, the Consulate and the First Empire, should have been wantonly swept away and the tomb of St. Bernard destroyed as late as 1816, when the Bourbons had been restored to the throne of their ancestors. The splendid church of St. Bertin in St. Omer, one of the chief architectural monuments of the north of France, was demolished in 1830 (with the exception of the tower and a few inconsiderable fragments) by the municipality, under the pretence of giving employment to the people. The fine cathedral of Arras (which dated from the twelfth century) was destroyed during the reigns of Napoleon I. and Louis XVIII. Nor has so-called "restoration" been a less important factor in the destruction of many of the most interesting buildings of France. The abbey church of St. Front (now the cathedral) in Périgueux, which dated from the tenth century, and was one of the most important examples of the Byzantine style in Europe, has been virtually rebuilt and deprived of all character. The curious church of St. Germigny-des-Prés, in the Orlennais, built at the beginning of the ninth century on the model of the cathedral of Aix-la-Chapelle, has

been similarly treated. The old abbey church of Brantôme has been so scraped and tinkered at that it might pass for a newly-erected *quoad sacra* in a Scots manufacturing town. But among all the instances of nineteenth-century vandalism which can be quoted, none of them surpasses the deplorable destruction of the great abbey church of Cluny, which, after St. Peter's at Rome, was the largest church in the world, and could hold 30,000 people.

A visit to Cluny can easily be managed from Mâcon, from which it is only 15 miles distant and the trouble of the journey will be well repaid. Apart from the remains of the great abbey the little town contains two churches of very considerable importance, and in its narrow streets possesses more examples of the domestic architecture of the twelfth, thirteenth and fourteenth centuries than any other place in France. But it is chiefly as the cradle of the great Order which there sprang into being that there will always linger around the valley of the Grosne a special and peculiar interest. In the heyday of the Order, 314 monasteries scattered over the length and breadth of Europe owned the sway of the abbot of Cluny, who was really the head of a little principality, coining his own money and directing the affairs of the brotherhood without even admitting the dictation of the Pope himself.

It is curious that the Cluniacs, despite their success in other countries, never made much headway in Scotland. The only monasteries of the Order north of the Tweed were Paisley, Crossraguel and the little Abbey of Faill, in the parish of Tarbolton. Considerable portions of Crossraguel still exist, and at Paisley we have left to us the fine abbey church, though the remains of the domestic buildings have been in recent years ruthlessly and unnecessarily swept away. Faill is, I am afraid, best remembered by the old rhyme:—

The Monks of Faill
They made gude kail
On Fridays when they fasted,
And never wanted beef or ale
As long as their neighbours' lasted.

The rise and early history of the Order of Cluny are full of picturesque interest. By the irony of fate the body which a few centuries later was to become a by-word for pomp and luxury, was originally founded as a protest against the laxity into which monasticism had fallen in the tenth century. The founder was Guillaume le Pieux, Duke of Aquitaine, who, in 909, having decided to build and endow a monastery, set out with Bernon, the abbot of Baume-les-Messieurs in the Jura, to choose a suitable site. The duke and the abbot, travelling together, at last arrived at a spot so deserted that (as the chronicle says), "il semblait en quelque sort l'image de la solitude céleste." Bernon thought the place suitable, but Guillaume objected, pointing out that the monks would be subject to molestation from the hunters and their dogs tracking the game in the neighbouring forests. Bernon, however, brushed the objection aside, and told the duke to drive away the hunters, as there could be no comparison between the advantages of mere sport and the ultimate benefit he would derive from the prayers of the monks. This argument seems to have had great weight, and in the deed of gift the pious Guillaume sets forth very candidly his conviction that by his liberality he was materially helping to secure the future, not only of his own soul, but those of sundry of his kinsfolk as well. The conveyance included the domain of Cluny, farms, vineyards, forests, &c., not omitting "slaves of both sexes." The monastery was to be dedicated to SS. Peter and Paul, and was to follow the rule of St. Benedict. Bernon was nominated the first abbot, but after his death the monks were to have the right of choosing their own head. In accordance with a custom of the time, the deed concludes by an impassioned invocation of the punishments alike of Dathan and Abiram, Judas, Antiochus and Heliodorus upon the head of anyone who should contravene its provisions.

Bernon gathered together a little community of twelve monks and at once set about the erection of the monastery. St. Odo, who succeeded him as abbot, was, however, the real founder of the future greatness of Cluny. To him is due the initiation of the plan of establishing dependent communities of monks owning the authority of the parent abbey, and he succeeded in extending his sway over a number of monasteries in different districts of France and Italy.

St. Maieil and St. Odillon, the third and fourth abbots, worthily continued the work of St. Odo. St. Odillon especially wielded much influence, and was the trusted ally and friend of popes, emperors and kings alike. He added to and greatly improved the monastic buildings, and at the close of his reign was able to say (paraphrasing the words of Augustus) that he had found an abbey of wood and left behind him an abbey of marble.

But it was under St. Hugues, the successor of St. Odillon, that the Cluniac Order reached the zenith of its power and influence. St. Hugues had been in early life the intimate friend of the imperious and masterful Hildebrand, who, becoming Pope under the name of Gregory VII., is best remembered for

the haughty audacity with which he compelled even an emperor who had displeased him to stand waiting in the snow at the gates of his castle. The Pope did not forget his old comrade, and spared no effort to promote the prosperity of the Order of which the latter was the head. The wealth of the Cluniacs enormously increased. Fresh monasteries were founded in every part of Christendom, and older foundations were brought in under the sway of the abbot. But with all the power vested in him, St. Hugues was wise enough to see that it was judicious to consult from time to time the wishes of the community. Chapters-general were held, at which delegates from all the subordinate monasteries were present, and at these assemblies measures for the general good of the Order were brought forward and carefully considered.

The almost boundless charities dispensed by a great abbey like Cluny in the days of its glory afford alike an indication of the enormous wealth of the monastic orders and a proof of the liberality and benevolence of the monks. Udalric, in his "Antiquiores Consuetudines Cluniacensis Monasterii," mentions that, during the year in which he was writing, the benefactions of the abbey had been extended to 17,000 persons, and we may be certain that in the days of St. Hugues the charities of the Order were administered on a similarly generous scale.

We are too often apt to think of the monasteries only as they were in the days of their decadence, when wealth and luxury had in too many cases sapped their former usefulness, but we should never forget the invaluable services rendered to the world by the monastic orders at an earlier stage in their history. In feudal times, when the rude barons too often regarded the humane letters from the point of view of Archibald Bell-the-Cat, the abbeys were the only centres of light and culture. But apart from their services to education and apart from their benevolence and unstinted hospitality, we should bear in mind how much was due to the monks in reclaiming waste lands and turning barren stretches of moorland into vineyards and orchards and fertile fields. We should recollect that they were the first to recognise that the serf who tilled the soil was no mere chattel but a human being, and that while the great feudal lords ground their vassals to the earth with exactions of all kinds, the tenants of the abbeys were treated with kindness and consideration.

But I must return to St. Hugues. The Order of Cluny so increased under his wise and beneficent rule that the then-existing abbey church was found quite insufficient for the needs of the monastery. He accordingly decided to build a church more in consonance with the requirements of the time, and the great edifice which was so ruthlessly swept away was the result. When completed it excited such universal admiration that a legend arose that the plan had been given to Gauzon, the architect, in a dream by St. Peter himself. The church was in the form of a patriarchal cross—that is to say, it was cruciform, with a second or eastern transept. This arrangement is by no means uncommon in England, being found at Canterbury, Lincoln, Salisbury, Rochester, &c.; but in France the feature was unique. The architecture was, of course, Romanesque, the style in which all the great monastic churches of France are built. The nave was very lofty, and had double aisles. At the west end was a great narthex or vestibule, a feature characteristic of churches of the Cluniac Order, the best surviving example being found at Vézelay, in the Morvan. The form of the narthex varied. At Cluny it was an outer church with aisles. It has never been exactly ascertained what the purpose of these vestibules was, for while Viollet-le-Duc holds that they were intended for penitents, another, and to my mind a more plausible, theory is that they were for catechumens or proselytes, who were not allowed to enter the church. This is believed to have been the purpose served by the Galilee porches at Durham and Lincoln. The entrance doorway was ornamented by elaborate sculptures, similar to those still to be seen at Moissac. The length of the church, including the narthex, was 561 feet, 5 feet more than Winchester Cathedral, the longest church in England, a notable circumstance when it is borne in mind that English churches are specially remarkable for their great length, though they lag behind their French sisters in breadth and height. The breadth of the nave was 101 feet. A curious feature was the little chapel of St. Michael, suspended at the height of the aisle vaults between the narthex and the nave, supported by corbelling. The choir, with its richly-carved stalls, its frescoes and priceless tapestries, and its double *jube* or rood-screen, must in magnificence have hardly yielded to St. Denis itself. The tomb of St. Hugues occupied the centre of the sanctuary, which was surrounded by an ambulatory and five apsidal chapels, filled with splendid monuments. Three huge towers surmounted the great transept, while another stood at the centre of the eastern transept. Two smaller towers were placed at the entrance to the narthex.

The view of the abbey which opened to the eyes of the wayfaring pilgrim entering the fine double gateway (still happily in great measure spared to us) must have been very striking and imposing. On the one hand lay the abbot's

palace with its hanging garden, in front of him towered the great church standing on a raised parvis approached by five steps, in the other direction stretched away the long ranges of the domestic buildings, so extensive that at one time it is related there were gathered within the abbey walls Pope Innocent IV., St. Louis and his mother and sister, the Emperor of Constantinople, the princes of Aragon and Castile, the bishops of Senlis, Evreux and Langres, each of these personages being accompanied by a numerous suite, and yet the 400 monks were not put to the slightest inconvenience or interfered with in the use of their refectory or dormitories.

DUNBLANE CATHEDRAL.

A PARTY of members of the Dundee Institute of Architecture, Science and Art visited Dunblane Cathedral lately, when Dr. Rowand Anderson received them and explained the restoration which he has carried out. He pointed out at the outset that had it not been for the Marquis of Lothian the building would not have been in its present state. The Marquis, he said, was not a member of the Established Church, but he was sufficiently large-minded to take a broad view of everything that was for the good of his country. He appealed to the Queen and button-holed everybody who had any influence until he at last carried his project into effect. Proceeding, Dr. Anderson said the first thing he as the architect did was to get the building roofed in for the protection of the walls. In a discussion at a meeting of the Edinburgh Architectural Association the question of preservation *versus* restoration was raised. He maintained that the only way to preserve was to use the building for the purpose for which it was erected. They all knew the old saying, "An empty house is a bad tenant," and there was no doubt that had this work been delayed for a few years longer a series of violent storms would have made an end of it. The question was also raised that by the restoration of the cathedral one was destroying the picturesque character of Dunblane. He asserted that buildings were not erected for the purpose of forming studies for painters, but were put up for use. The church, he said, was not rich in monuments; possibly there were a good few of them, but they are nearly all gone. Amongst the more interesting monuments were the three blue stone slabs (lying within the choir), the matrices of brasses which had been placed there to the memory of Margaret Drummond and her sisters Euphemia (Lady Fleming) and Sybil Drummond, who came by a tragic end at Drummond Castle in 1502. With Margaret Drummond—who was described as a lady of rare perfections and singular beauty—James IV. fell deeply in love, and made her a promise of marriage. But for political reasons the nobles wished the young king to marry a daughter of Henry VII. (a woman who brought nothing but mischief and trouble to Scotland), and the clergy also forbade the alliance as being within the forbidden degree of consanguinity. As the king was obstinate, his mistress's death was resolved upon, and this was effected by means of poison mixed with food served up at a breakfast to which she had been invited by her two sisters. They perished with her, and the legend goes that they were carried to Dunblane and buried in the chancel of the cathedral. The brasses had been stolen, no doubt, for the value of the metal, and the Doctor thought the least the descendant of these ladies—the Earl of Ancaster—could do was to restore them. In answer to a query Dr. Anderson said there was no actual proof of this story, but it was a historical fact that they were buried in the choir at Dunblane. The founder's arch, he said, was discovered and restored in the north wall of the choir, and in it had been placed an effigy which tradition said was that of Bishop Dermoch, but which there was reason to believe was no other than that of Bishop Clement, the builder of the cathedral. Amongst the other effigies were those of a knight in armour and his lady. The knight was said to be the second Earl of Stratherne, who died in 1271; but the character of the armour and dress pointed to an earlier period, and he believed that the knight was no other than Gilbert, first Earl of Stratherne, who founded the See, and endowed it so richly in the early part of the thirteenth century. Subsequently Dr. Anderson led the way to the nave, where there is another sepulchral niche containing an effigy which is traditionally known as Bishop Ochiltree's, but the figure did not belong to the niche, as the feet had been cut away to make it fit. He also called attention to the beautiful screen dividing the choir from the nave, the elegant east window erected by John Stirling Maxwell of Pollock, Bart., and the chancel arch. Over this arch there is a double-arched opening, which has greatly puzzled experts. From the number of holes underneath the arches, it probably supported a gallery, although what that gallery was there for was unknown.

Dr. Anderson then led the way to the place used as a meeting-house in connection with the cathedral, branching off the choir, which he said was talked of as being the chapter-house. One member of the company remarked that it was

more like a lady chapel, and another suggested that it had possibly been used as a confessional. In reply to the first remark the Doctor answered "No," and said there was nothing of the nature of a confessional about it. He did not think there was such a thing existing in any church as a structural confessional. The confessionals were generally pieces of furniture. This concluded the inspection of the cathedral, and the company were then treated to some music on the grand organ by Miss Willison, Balhaldie House, Dunblane.

In proposing a vote of thanks to Dr. Anderson, Mr. Mackison, burgh surveyor, Dundee, president of the Society, said the restoration was one that Dr. Anderson had the greatest credit in, and he hoped it would lead to his name being associated with the restoration of other ancient edifices.

Dr. Anderson said it afforded him great pleasure to meet such an intellectual company, and he was also glad to see so many representatives of the fair sex present, because it was of great importance to architects that they should take an interest in architecture—they had so much say in it, and it was right and proper that they should be well instructed. The work in connection with the restoration of the building had been a very great pleasure to him, though it entailed a considerable amount of anxiety, for he had to be very patient at times. He was glad to say, however, that in the long run he had met with great sympathy and support from the members of the restoration committee in carrying out the work. Of course, they knew that the great bulk of the cost had been borne by an excellent good lady, Mrs. Wallace, of Glassingal; in fact, without her liberal support the work would never have been done. There was one thing he would like to point out, and that was that what had been done here showed what could be done elsewhere. Destruction and failure were prophesied here, but the prophecy had not been fulfilled. There were many other buildings throughout Scotland which ought to be dealt with in the same way, and restored to their original uses. Whatever had been done, he maintained that old Dunblane Cathedral was still here. He hoped the good example that had been set in Dunblane would be followed elsewhere, and that the many interesting buildings scattered over Scotland would not be allowed to disappear off the face of the earth. They could not afford to lose them, because they were as much a part of the history of their country as any written document. A country without a history was a very uninteresting place indeed, and the more of history they had the more attractive the country was to themselves. Then there was the lower aspect to take—commercially, it was an excellent thing for Scotland. They had descendants all over the world, and these descendants were men of intelligence who liked to come back to the old country, and having read of these places it was sad for them to come home and see them lying waste and going to ruin. Though that was the lower view to take—the commercial view, to bring money into the country—it was one of the great duties of the people of Scotland to preserve the records of the past.

EXPLORATION OF HADRIAN'S WALL.

THE following circular has just been issued by Professor H. F. Pelham, Mr. J. L. G. Mowat and Mr. F. Haverfield, all of Oxford:—No branch of Roman history has been studied with so much success during the last few years as the military system and frontiers of the Empire. In every quarter, on the Rhine and the Danube, in Africa, Egypt and Asia, excavations are being planned and discoveries made. In Germany the Imperial Government has lately established and subsidised a Commission to systematically examine the *limes* between Coblenz and Regensburg, and the work has already produced important results. It is now proposed to make further exploration of the best preserved and perhaps the most elaborate of all the Roman frontier lines, that which crosses northern England from the mouth of the Tyne to the Solway Firth. Much has been done to explore this frontier line. The life-long labours of Dr. Bruce were full of fruit, and ten years ago Professor Mommsen was able to say, in his account of Britain, that Hadrian's Wall was at that date the best known of all the Roman frontier defences. But the progress of inquiry has brought forward new problems, and further exploration seems necessary. In particular, it is desirable to examine the Vallum, the strange and solid earthwork which accompanies the Wall for almost all its length, and further to ascertain whether our Wall is attached to any gromatic ditch like that recently found in Germany. It might also be possible, with the consent of landlords, to explore one or two of the stone forts and fortresses of the Wall. For all such work the present is pre-eminently the time when other workers in other countries can interchange discoveries and lend mutual aid. The visit paid to the North of England last summer by General von Sarwey, military director of the Reichslimes Commission, showed how much such interchange of aid may profit. Fortunately the work is not only proposed, but begun. In Northumberland the Newcastle Society of Antiquaries dug

some sections in the Vallum last summer with very notable results, and the work is to be continued. The Cumberland Archaeological Society has voted 50% and appointed a small committee to select suitable sites and promote excavations along the western part of the Wall. We venture to appeal for subscriptions to be applied, according to need, to these good works.

TESSERÆ.

Rembrandt as a Colourist.

THERE is no doubt, for the colouring and chiaroscuro, Rembrandt is one of the most able artists that ever lived. Nothing can exceed the beauty, freshness and vigour of his tints. They have the same truth, high relish and sapidity as those of Titian. Indeed, they have the closest resemblance to the hues of Titian when he had Giorgione most in view. There is identically the same attention to the rilievo and force obtained by his strong shadows and low deep tones; and his chiaroscuro, though sometimes too artificial, is yet often (particularly in contracted subjects) productive of the most fascinating effects. It may be worth observing that no part of Rembrandt's excellence is derived from the loads of colour which he has employed, or from the obtrusive, licentious, slovenly conduct of his pencil, or his trowel, which he is said to have used. Whether he was originally led to this affectation by the uncertainty of painting without previous determination, or whether it was the mere affectation of differing from his contemporaries, who were generally solicitous about high finishing, matters not; but the practice ought to be avoided. If it had arisen, as it does in old Bassano, from an attention to the details of his objects, and was nowhere used but as these details called for it, it might appear the effect of a mastery and freedom which might plead its allowance; but in Rembrandt it is not less disgusting than it is useless, for although it may be true that the unpleasantness of the manner disappears at the proper distance for seeing the work, yet the effect of the picture at this distance has no advantage over a picture of his contemporaries, Jordaens or Vandyke, whose tints are equally true and precious with those of Rembrandt, but whose beautiful handling or manner of execution is much more compatible with all the other great concerns of art.

Greek Buildings.

A pure Greek building is a work of art cunningly, *i.e.* knowingly, devised, to which common sense furnished the ground-plan, a fine sense of proportion the elevation, and an exquisite perception of the beauty of curves the details. Every stone in it was the object of study on the part of the architect, and of patient labour on the part of the workman. Greek architecture has been chiefly reproached for uniformity in plan and elevation, a consequent want of the picturesque, and a repetition and want of variety in its details. Certainly in the temples, which are almost the only buildings with which we in England are acquainted, there is much sameness. It has been said, with a degree of truth, that all temples are alike. But, in justice to their designers, we must consider what were the requirements of Pagan worship: a dark naos or cella, for the reception of the statue of the divinity; a pronaos or antechamber, to receive the statues of great men; an opisthonaos, to contain the offerings at the shrine and the vessels required for sacrifices. What could answer these requirements better than a dipteral or pseudo-dipteral temple? To have departed from simplicity in plan and elevation, by throwing out projections or carrying up towers for the sake of effect, would have been a departure from the two great principles of common sense and economy (to use the word in its widest signification), both of which ought to guide architects at all periods of their art. So much for the temples, to which naos and pronaos were as essential as nave and chancel to a Gothic church. But when we come to other buildings, such as gymnasia, thermæ and such like, and the edifices within the temenos of the temple, we shall find that they were arranged as convenience required, and with a certain regard for the production of a picturesque effect. The grouping of Greek buildings is eminently picturesque. Any one who has not visited the Acropolis of Athens will perceive this by looking at a good view of it in which the buildings are restored. By the side of the noble flight of steps leading to the Propylæa, the beautiful little Temple of Wingless Victory juts out at an angle with the building above it. The bases of the Propylæa, the Parthenon and the Erechtheum are in different planes, and they combine with the irregular distance in which they stand to form a most picturesque grouping, which seems to be studied instead of fortuitous. Take again the city of Priene, built upon the lowest spur of a magnificent mountain, its lower walls washed by the sea, its higher walls climbing the mountain side, its stadium, gymnasium and agora towering one above the other in an irregular manner beyond them, the massive terrace, with the Temple of Minerva Polius at one end of it, and, above all, a precipice some 600 feet high, crowned by the Acropolis. These

various masses of buildings, arranged as they are without the advantages of such a magnificent site, would form as fine a picture as the cathedral, campo santo, baptistery and belfry of Pisa. The Greek architect made the best of the materials at his disposal, as far as his imperfect knowledge permitted; he built after a certain system of proportion; he studied the minutest details, and designed mouldings to suit their various positions; and finally made use of many refinements to improve the perspective effect. A pure Greek building is a model of sound construction, built generally upon a rocky site, hollowed to receive them; the foundations of the platform consist of various blocks of rough stone, laid alternately, transversely and longitudinally, and cramped together. If the stylobate is of unusual height cross walls bound the foundations of columns with those of the cella and with one another, the intermedial spaces being filled with smaller stones well compacted. This was the case in the Temple of Apollo Smintheus. Upon this foundation were laid the steps and pavement of the precious white marble brought from Paros or Cyzicus. The plinths of the columns were frequently placed in slight sinkings in the pavement. The drums were united by dowels of bronze. The walls of the cella were so well worked and closely laid that the joints are imperceptible. These and the architrave stones, friezes, cornices, transverse beams and lacunaria were so strongly joined together by means of cramps run with lead that the whole formed almost a solid mass, which the earthquakes of 2,000 years and the violence of men leaves only partly rent in sunder.

Giulio Romano as an Architect.

The architecture of Giulio is markedly different from that of everyone else. He strongly affected square forms, and seems to have laboured as much as possible to divide his buildings into square, or nearly square, compartments. The recipe does not appear very promising, and yet the Palazzo Cenci, as it was once called (or Palazzo Maccarani), in spite of dilapidation, is a noble design. Giulio may be considered as the last of the Roman architects. Their style is marked by a severity which some critics prefer to the grace and beauty of the Palladian. They followed a beau ideal of a higher character and expression, although Palladio undoubtedly reached his object much more nearly than any of the Roman architects. Had Raphael lived and followed architecture, something far superior might have been attained, but he could hardly have done more for the Roman style than Palladio did for that which he pursued.

Poetry in Art.

It has been very truly as well as elegantly said by Ovid that Venus would have for ever remained buried under the waters if she had not been happily drawn out by the pencil of the ingenious Apelles. And indeed, everything considered, it would be very difficult to divine in what state, and to what degree, the whole or any part of the sublime imagery of the Greek and Latin poets could be communicated to their readers if these matters had not been thus realised to our eyes in the works of art which fortunately remain. Words after all are but words, and there is no peculiar art in poetry which can make them anything more. They are but symbols formed for the eye out of twenty-four arbitrary scratches called letters, and certain vibrations of the air, occasioning certain irritations in our organ of hearing, which by national compacts are made to suggest the idea of existing things, with their several modes and degrees of relation. And though the communication of all this matter of compact is more or less perfect according to the degrees of our education in it, yet how very imperfect it is, even at the best, will soon appear on attempting to describe in mere words any individual complex forms, as the portrait or likeness of any man's face, and numberless other matters which need not be mentioned. However, what language wants in precision is abundantly compensated in the facility and extent of what it does communicate in the whole range of characters, passions, sentiments and intercourse of society. But this facility, extent and use of language, applied as it is to all arts, sciences, trades and other objects of human concern and knowledge, is common, and more or less every man's inheritance, and Malebranche, in his "Inquiry," and Nicole, in his "Essais de Morale," Swift, Cervantes, Sterne and many other prose writers have at least as deeply and extensively applied this language as any of the writers in verse, whether of the comic, tragic or epic kind. It should seem then that the advocates for the superiority of poetry over painting have been contending for advantages which are by no means peculiar to poetry, and a stickler for Cocker's arithmetic might as well contend for the superiority of his own art, since there are many numerical combinations about which the art of painting would be employed to little purpose. Let us suppose for a moment that a great artist, a Michel Angelo, a Raphael, Poussin or Rubens, was deprived of his sight; his art would then be utterly lost to the world. He would no longer have it in his power to hold out that mirror of ingenuity, where the whole visible creation is magically portrayed with so many accumu-

lated advantages, where all its beauties are united and all its deficiencies, imperfections and incongruities taken away. Yet, notwithstanding all this, if you will allow him the use of language, he has it still in his power to talk of all these things, and whether this talk be delivered in prose or verse, whether it be sung or said with more or less energy, you have still remaining all that poetry can give, which, as was observed before, is only an animated account of certain productions of this master art, this improving mirror of nature, which his blindness debars him from calling into actual existence. Hence, then, we are warranted to conclude that fine art may, to use a French phrase, be justly termed "L'art par excellence."

Composition of the "Laocoon."

Whatever be the main scope of the subject, and whatever materials it may with propriety afford, whether of the simple, pathetic, or heroic and sublime kind, the first and chief attention of the composition should be to dispose such materials in the manner best calculated to enforce and ennoble this main scope or end, which the subject proposes, and to reject or carry into the parts of least consequence whatever does not contribute to this end. For example, in the subject of *Laocoon* the principal aim of the artists should be (as it has been) to impress upon the mind of the spectator those emotions of terror and pity which must arise from that climax of distress exhibited in the unavailing efforts of an agonising father and his children, the children calling upon the father for assistance, and he upon Heaven, that has abandoned him to his fate. A second consideration of interest, and which greatly enforces the first, is the graceful, beautiful forms of the children and the noble, vigorous, athletic figure of the father, which is admirably calculated to exhibit those convulsed gripings which agitate every part. If, agreeably to the absurd wishes of some shallow critics, these sons of Laocoon had been of the same soft, pulpy texture as the children of Fiamingo, besides being fitter for the nursery than as attendants upon the altar, their little bladder-like forms would have been incapable of discovering any interior agitation. It may be further observed that were these figures encumbered with drapery it could have no relation to the main end: it would then be occupying space to no purpose, or, what is worse, to a bad purpose, as it must divert or divide the attention to inanimate things foreign to the main end, and interrupt the unity of this expression of agony and distress, which should be pursued throughout. Besides the variety arising from the different ages and characters of these figures, their actions and positions are so diversified that in every view of this admirable group the eye is presented with a combination of circumstances and aspects so beautifully varied from each other that it is difficult to say which is the most to be admired, the vehement, direct and uniform address of the subject, or the graceful and skilfully-variegated manner in which it is communicated. Pietro da Cortona has treated this subject upon quite other principles. Blind as he was to all its grandeur, pathos and real excellence, his composition was, as usual, thrown away upon what is in many cases mistakenly called the picturesque arrangement of heights and distances, lines, angles and other mechanical subordinate attentions, which may be of prime consequence in trifling subjects, but which in such cases as the present should never be sought after but as aids and agreeable attendants upon those matters of higher consideration which never enter the thoughts of unfeeling and mere mechanical fabricators of composition. Such men do but disgrace themselves in great subjects. The matters of art are suited to all capacities when artists know how to make a prudent choice; from still life upwards every man might find something of a piece with himself.

Flat Washes.

There are certain difficulties in the management of water-colours which must be surmounted and methods of practice in manual operation to be acquired before the learner can hope to make any progress. He who without method will begin to make his efforts at random, and hardly knowing what he intends to do, must necessarily fail, for although many parts of a work of art may in some measure be subject to accidents, of which advantage may be taken by a master, yet the whole can never be produced by chance or be formed by a combination of such accidents. The first of these experienced by a beginner is spreading a breadth of any colour with any equal strength of tint, and of laying it so as to produce the desired or intended form. In the first operation, that of making an equal wash with any colour, the following precautions are to be used:—(1) The colour must be mixed of an equal tint, and in a sufficient quantity to cover the given space, so as not to require any alteration during the operation. In these trials India ink or sepia may be substituted for colour. (2) It should be diluted until it is sufficiently fluid to flow freely from the pencil, and to be distributed readily upon the paper, in doing which a large pencil is to be preferred, as it will contain more of the colour and keep it more equally moist than a smaller one will do. (3) The paper should be held with a moderate degree of

inclination by placing the drawing-board on the lap, with the upper part leaning against the easel or a table; then beginning at the upper part and descending the colour will run downward and settle equally. (4) In order that it may do so the pencil ought not to be used with too much haste or be carried over the paper faster than the colour will follow it, the readiness to do which will depend upon the inclination of the surface. The learner will soon discover that to cause this equality it is requisite that the whole of the space covered should be equally wetted with the colour as possible. In the first attempts he will probably continue to drive it until the pencil is exhausted, and by neglecting too long to supply it the part where the addition is made will be unequal, in consequence of its being more wet than that it was joined to. The attraction between parts of the same or of different colours, according to their different degrees of moisture, being the principal cause of that inequality of tint the learner finds it difficult to avoid, he ought to observe how it acts and use the means to prevent its recurrence. He may observe that in a breadth of colour if from delay in spreading it or any other cause one part is beginning to dry while another in contact with it continues quite wet, the drier part will attract the more fluid colour until it is prevented by too great a degree of dryness from conducting it further. Where it stops a streak will be formed of unequal tint, and darker than any other part of the space. For this reason the colour should not be unnecessarily worked about by the pencil in a space already covered with it, as it will by that means be continued wet there when the edges and extreme parts are beginning to dry. This should be carefully attended to, being that which renders the practice of painting in water-colours in some respects more difficult than painting in oil, the latter allowing time enough for every operation. When it is required to lay the colour so as to produce certain forms these should be well considered, to avoid any alteration, if possible, during the operation. For the reasons before assigned the colour should be spread as speedily as possible and without needless alteration of the form or attempt to rectify what is carelessly done by a touch or dash equally careless and at random. When the form is expressed the sooner it is left the better; working upon it longer than while the colour continues sufficiently fluid to spread freely will cause muddiness and inequality of tint. Any required alteration may be best made after the part has been dried with the same tint, extending it carefully into the desired form. This should be done with little colour in the pencil, and neatly joined to the part to which it is added; the least touch of the colour over what was done before will form a dark place, making the additional part appear as a patch, which should be carefully avoided. A gradation of tint, or what is called "softening off," may be made in extending the colour by touching upon its edge with the pencil and water only; by keeping in readiness another large and clean pencil to apply the water the operation will be facilitated. This will attract the colour and cause it to descend and spread upon the part so wetted.

Use of Timber.

To obtain the greatest strength in timber beams, joists, rafters and bresssummers, the depth must greatly exceed the width—the greatest strength opposed to the greatest strain. A joist 6 by 3 will bear twice as much if put edgewise as it would if laid flat. If the weight to be supported be in proportion to the length, then, the width remaining the same, the square of the depth divided by the square of the length ought to be the same also, *i.e.* the depth of a joist ought to be in direct proportion to the length, and for stiffness the width proportionate to the depth. Where the question is of a piece of timber supporting itself, the weight is as the length multiplied by the depth, and we must multiply this again by the length for a divisor. A rod of fir inch square, or a plank 10 by 1 laid flatwise, would keep quite straight with a bearing of 5 feet. A piece of timber 10 inches square would swag very much with a bearing of 50 feet.

Greek and Roman Theatres.

The stage of a Roman theatre was much broader and deeper than that of a Greek theatre. The passages leading at each side from the stage to the orchestra were arched over to make room for more seats in the Roman theatre, and there was a flight of steps in the middle of the auditorium where in the Greek theatre there was a block of seats. Outside, however, there was a greater difference between a Roman theatre and a Greek theatre. It had been impossible for the Greeks with their columns and beams to make a great auditorium on level ground, because such great masses of stone could not be supported by columns and beams. They therefore generally placed theatres in the trough of a valley or on the side of a hill which could be hollowed into a semicircle, making the rows of seats in the natural rock or earth, with but little artificial assistance. The Romans could employ arching, which carried far more weight, and could therefore build their theatres on level ground, with a semicircular wall for the outside of the auditorium ornamented after a new fashion.

NOTES AND COMMENTS.

LOSSES through deprivation of amenities are generally difficult to estimate when valuing property, especially when the enjoyment is only occasional. A claim and subsequent assessment of the kind were the cause of setting aside the verdict of a jury which otherwise would be considered as well founded. The case came on appeal before the Queen's Bench Division on Monday. The London School Board, under the Lands Clauses Acts, took possession compulsorily of a solicitor's house and office at Greenwich. The house was held on lease, of which thirteen years were unexpired, at a rent of 40*l.* per annum. The solicitor claimed 250*l.* for the lease and 1,500*l.* for loss of business, &c. There was also a claim for his loss of access to the Thames, which, as we have said, became the vulnerable point of the case. As the solicitor was able to secure offices in the same street, he was willing to have his claim for loss of business reduced. An inquisition was held, and the sub-sheriff, in putting the case to the jury, divided the claim as follows:—"First, there is the leasehold interest in the old premises. Then there is the 25*l.* for the removal and readjusting his office. Then there is the question of his being disturbed in his business as a solicitor, whatever you think it right to give upon that question, and then there is, further, the loss of amenities and enjoyment of his old premises, for which you should give him something, if you can find in money what will compensate him." The jury awarded 563*l.* It was not stated whether that sum included a farthing on account of the deprivation of access to the river, but that such an item was put before them was sufficient to authorise the School Board to apply for a *certiorari* to have the verdict quashed. On Monday the rule was made absolute. Mr. Justice CAVE held that compensation for loss of access to the river was included in the sum given for the leasehold interest in the premises, and it could not be given twice over. As it was impossible to distinguish how much was allowed for amenity, the verdict must be quashed. Mr. Justice COLLINS also considered there was no alternative but quashing. It is more than likely that the jury took the same view as the two judges, that the access to the river was an interest of which they could not reckon the value; but as there was nothing to indicate whether that was the case, the claimant has had to suffer.

THE position that is assumed by the Royal Academicians in dealing with lithography is inexplicable. There is a "Black-and-White Room" in the Academy, to which drawings in crayons on paper are admitted. Why should impressions of similar drawings on stone be rejected, especially when impressions from wood-blocks, steel and copperplates are welcomed? The French place lithography on a level with engraving in their exhibitions, and not only are lithographic plates shown on the same walls as etchings or engravings, but they are also eligible for winning the medals and "mentions honorables." But then the French are aware that lithography is most difficult work, which Academicians from DELACROIX to FRANÇAIS have undertaken in order to display their skill, and in the ateliers of the foremost painters lithographic stones are to be seen. The majority of our English Academicians have neither the skill in drawing nor the precision of touch which is required for the work, and naturally they undervalue what they cannot undertake. Lithography is therefore treated like photography. The academic mind regards it as one of those arts to which this year's motto on the title-page of the catalogue applies:—"It is only the disease of the unskilful to think rude things greater than polished." Lithography when vigorous is probably thought to be rude, and a pictorial plate cannot well be produced from a stone if it is polished. But REMBRANDT would not have considered the facilities which a "grained" stone offered for expressing chiaroscuro as inadmissible, and there is no country in the world where the art is treated with the contempt which it receives in England. That, of course, arises from the example given by the Royal Academicians, who have their own peculiar reasons for standing apart from a process which is as merciless as fresco in revealing the weakness of incompetent people when they meddle

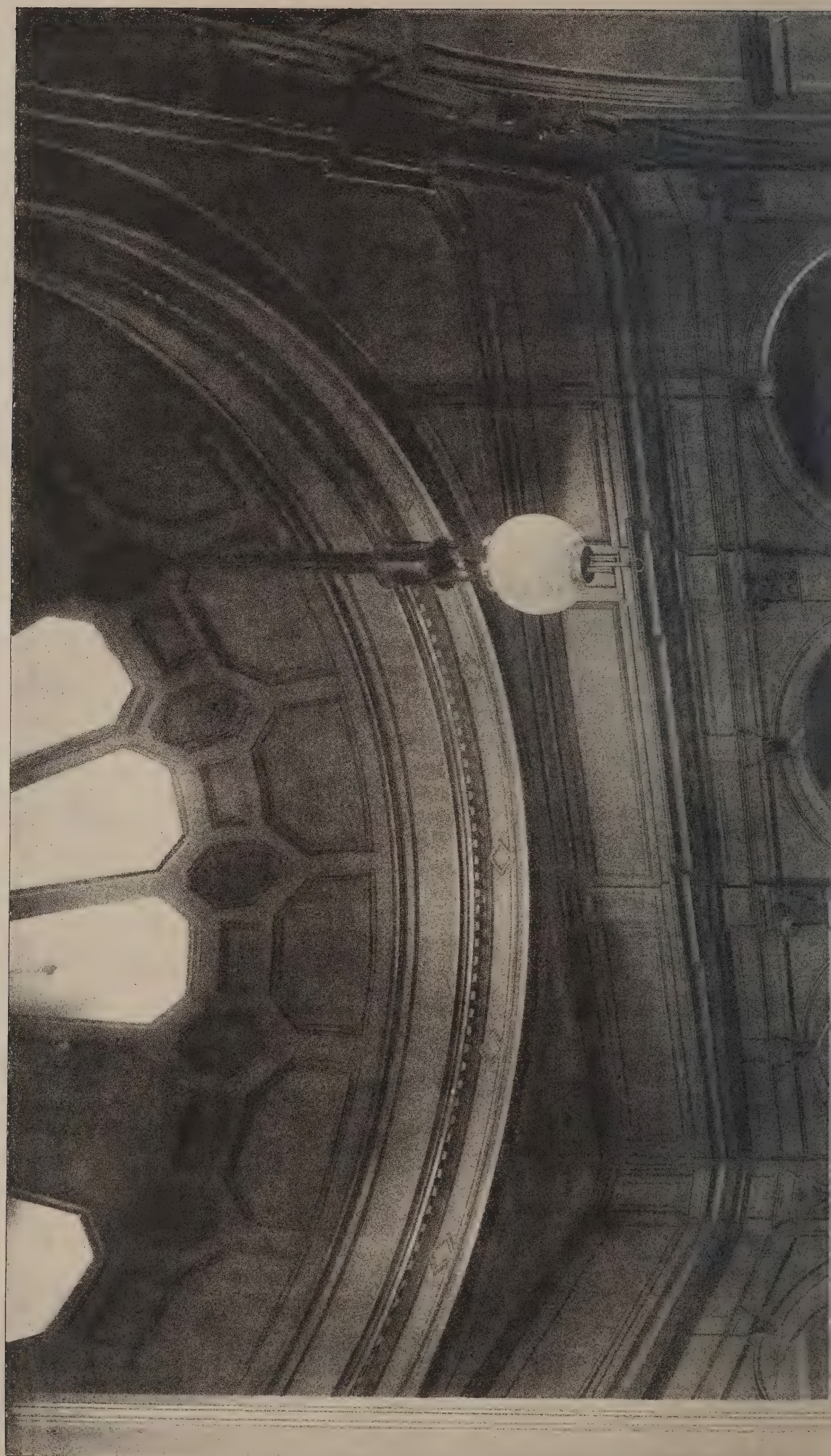
with it. Lithography has, we admit, one disadvantage. It is a modern art which was applied from its origin to business purposes. But if that objection helps to make it obnoxious in Burlington House, the Academicians should also consider that the arts which they represent have been also utilised as aids by traders.

GERMANY is proud of its contributions to the Chicago World's Fair. It was therefore to be expected that a record of the department should appear. We have the first volume, which is brought out by the Bavarian Society of Art Industry, under the direction of Professor GMELIN, and published by M. SCHORSS, of Munich. In addition to the blocks in the descriptive introduction there are fifty-six large plates representing examples of many kinds of "Kunstgewerbe." The skill of the Munich draughtsmen and photographers is everywhere known, and it would not be easy to discover an example of an exhibition catalogue which surpasses Professor GMELIN'S. The designs are characteristic. In all we find a surprising strength and accuracy. The Germans are glad to exhibit a national pride by treating Gothic and Renaissance types after the manner of their predecessors. The ornament therefore appeals to one of their countrymen more closely than to a stranger. But everybody can appreciate the precision of lines and contours, however small, and the knowledge shown in the disposition of ornament. Signs of thorough drilling are evident everywhere, as well as respect for tradition. Is it in revolt against the national love of discipline that so many examples of rococo are produced? At one time, when French ideals were set up for imitation by kings and princes, the style (if it can be called by that term) might be supposed to be delightful and expressive by courtiers, but as those days have passed away rococo should be made to follow them. The German mind has not the frivolity that is necessary when lines are to be turned in wrong directions at unexpected moments, and German fingers are too strong for the fantastic tricks that are only excusable by their nimbleness. It will be said that in Germany work has to be turned out to suit all the markets of the world, and as long as carved and gilded rococo finds many purchasers it must be designed and carved. That excuse does not explain the admiration it receives, and which we believe is a relic of an old belief that fettered the genius of the land in order that rulers might be gratified.

THE works that are submitted every year in order to compete for the prizes offered by the Académie Française are generally varied. This year M. E. BERTRAND has been awarded 1,000 francs for his book on "Painting and Art Criticism in Antiquity." M. LEMONNIER has gained a similar sum by his volume on "French Art in the Time of Mazarin and Richelieu." The name of ROBERT BURNS is not unknown in the Academy, and, owing probably to the absence of novelty, M. ANGELLIER was rewarded with only 500 francs for his "Robert Burns, his Life and Works." A prize of the same amount was given to M. RODOCANACHI for his "Workmen's Corporations in Rome from the Fall of the Roman Empire." "A History of Roman Eloquence from the Death of Cicero to the Accession of Hadrian" was better adapted to please the judges, and the author, M. VICTOR CUCHEVAL, accordingly received 1,000 francs. The principal advantage of winning one of the prizes is the effect it produces in increasing the sale of the recipient's books.

MESSRS. W. & G. AUDSLEY, now of New York, have commenced proceedings against the New York Municipal Building Commission for damages on account of the loss sustained by being deprived of their designs and hindered from winning prizes by the inaction of the Commission. According to the conditions of the competition, six designs were selected for special consideration out of the 194 sent in nine months ago. But no decision was made about one of them being suitable for adoption, and meanwhile the whole of the plans are retained.

The Architect, June 22nd 1894.





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G. WASHINGTON BROWNE, Architect.



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HOUSE AT WREXHAM.



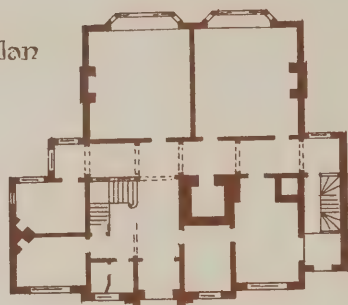
ENTRANCE LODGE, "BALLARD," COOMBE WARREN, SURREY.
W. F. POTTER, Architect.

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New Offices for the Reading School Board, Blagden Street, Reading.

Chas. Smith and Son, Architects.
Reading. March 14.

Ground Plan



St. Reading.



ILLUSTRATIONS.

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SCHOOL BOARD OFFICES, READING.

WE reproduce this week a perspective sketch of the new offices recently erected by the Reading School Board. The new building is in a central position, and contains the following accommodation:—On the ground floor—clerks' offices, accountant's offices, committee-room and attendance officer's office, with waiting-room and separate side entrance. On the first floor—board-room, the clerk's private office, committee-room and lavatories. On the basement—caretaker's quarters and heating chamber. The building is of local red brick, with Douling stone dressings. The work has been very satisfactorily carried out by Mr. THOMAS PILGRIM, builder, of Reading, from the designs and under the superintendence of Messrs. CHAS. SMITH & SON, architects, of Reading, Mr. GEORGE being the clerk of works.

HOUSE AT WREXHAM.

THIS house, which has been erected for Dr. E. D. EVANS, is situated at the corner of Egerton and Lord Street, having main entrance from Egerton Street, and is built in Ruabon brick with terra-cotta and Cefn stone dressings. It contains on the ground-floor breakfast, drawing and dining-rooms, kitchen, pantry, scullery, &c., with side entrance for patients, giving access to waiting-room, consulting-room and surgery. On the first-floor are nursery, five bedrooms, lavatory, bath-room and conveniences, with attics over. In the rear are the stable buildings, comprising two-stall stable, loose-box, harness-room, coach-house with loft over, also wash-house, coals and other conveniences. Mr. GETHIN, of Shrewsbury, is the builder, from plans and specifications prepared under supervision of Mr. T. G. WILLIAMS, M.S.A., 3 Cable Street, Liverpool.

BALLARD, COOMBE WARREN, SURREY.

BALLARD is the name of a large house erected at Coombe Warren, near Kingston-on-Thames, in 1873, for Mr. EDGAR, from designs by Messrs. F. & H. FRANCIS, architects. It was purchased in 1884 by Captain LEE GUINNESS, of Dublin, who erected a new wing, coach-houses and stabling, and other extensive additions, increasing the original length or frontage of the house, &c., from 200 feet to 400 feet. The new additions, stabling and lodge were erected from the designs of Mr. W. F. POTTER, architect, of 8 York Grove, Queen's Road, Hatcham, and are faced with red bricks and Portland stone dressings. The stable fittings were supplied by the St. Pancras Ironworks Company. Our illustration is a perspective view of the entrance lodge.

THE PHILÆ TEMPLES.*

THE proposal to raise the temples of Philæ I consider a question of great archaeological interest, as any attempt in this direction is certain to end in the ruin of these interesting remains. When the Egyptian Government engineers found that a reservoir on the Philæ site would submerge the Philæ ruins, they proposed to raise them, and included a sum of 200,000*l.* for this purpose in their estimates. A writer in the May issue of the *Nineteenth Century* considers that it would be far easier to raise them bodily than any of the buildings he has seen so dealt with in America. I beg to differ from him and maintain that the two problems are quite different, and the conditions totally dissimilar. A modern building is tied together by iron and wood; these are absent in an Egyptian temple. Modern walls are bound together by elastic adhesive materials; the old Egyptian work was laid dry. The cross section of a modern wall bears so small a proportion to its length that the elevating screws used for this sort of work can be readily applied in a definite direction and actuated from both faces, with the workmen in sight, under control and in hearing of the signal by which they work. This would not be the case in the propylon of Philæ, which is 22 feet wide at the base; more than half the workmen employed in lifting such a mass would be underground and out of control. Again, in the

modern building the loads on the foundations are fairly uniform, which admits of easy apportioning of the power to the weights to be raised. In a temple there are quite different conditions; the intensities of the loads for contiguous parts would vary constantly, so that I doubt the possibility of calculating them with sufficient correctness to insure uniform upward movement; this would mean fracture and failure of the operation. I never heard of a colonnade or of an arcade having been lifted by elevating screws. It would not be an easy matter to lift one that is in good condition by this means; a ruined one would be thrown down. All the parts of the temple would have to rise simultaneously, so that every wall would have to be prepared for lifting at one time. To get the shoring in and the elevators under the walls costly blasting in granite would have to be undertaken, to a depth of at least 4 feet under the walls and under the pylons. Miners would have to be imported from Italy or Trieste, as they could not be obtained locally, quarrying on a large scale having ceased in Egypt since the closing of the quarries near Alexandria, on the completion of the Port Said and Alexandria breakwaters and the Alexandria mole and harbour works.

The writer mentioned suggests that advantage be taken of the military precision of the garrison of Assouan to work the elevating screws; it is almost certain that they would not be permitted to perform work of this nature. It is also probable that they are not in sufficient numbers to do more than raise the temple piecemeal. The strength of this garrison is reckoned to be about 1,000 men. I estimate that the great propylon of Philæ cannot weigh less than 8,500 tons; using elevators capable of lifting 10 tons each, 850 men would be required to work them—the small inner propylon would require 250 men, or a total of 1,100 men. Elevators capable of raising 20 tons each would take more than half the garrison. The area of the propylæa is about one-ninth of the total area of the temple; 450 men would not suffice to manipulate the elevators required for the remaining eight-ninths. If the latter description were used they would probably have to be specially made; there would seem to be very little demand for appliances of this power, as only one English maker includes them in his trade catalogue. Hydraulic elevators could not be used, as their delicate valves would soon fill with sand.

It is said that the different parts of the temples (stone for stone) will occupy the same relative positions to one another after raising as now, except for the difference of level; it must, therefore, be contemplated to raise the whole island 40 feet. The island measures 417 yards by 135 yards; 836,000 cubic yards of material would be required to make up the difference of the level; the weight of this would not be less than 775,000 tons, and might exceed 1,000,000 tons, according to the description of material used. The whole of it will have to be obtained from one bank or the other of the river at great cost. If the temples can be raised they would stand on 40 feet of made ground instead of on solid rock as at present. This would complete their ruin in a very short time unless underpinning were resorted to; every building on the island would have to be treated in the same way.

It might be interesting to calculate the approximate amount of underpinning required and the probable cost, say, for the Temple of Isis. To make a thoroughly sound work of it a solid platform should be constructed under the whole, except the court behind the great propylon. I make this area equal to 24,134 superficial feet, the content equal to 965,360 cubic feet; at the Cairo rate of 2*s.* 5*d.* per foot cube for hard stone, roughly scabbled from quarry, in Portland cement, the cost monies out at 126,647*l.*, a very large proportion of the 200,000*l.* estimated. Although the estimate of 200,000*l.* is a large one, it may easily be exceeded. He must surely underrate their beauty in saying that the wonder excited arises from the magnitude of the masses handled by the ancient Egyptians, rather than from the merit of their works.

I have always understood that all visitors to the place—except perhaps one—are agreed that the scene of which Philæ forms such an integral part is the finest in Egypt, and that it compares favourably with all the famous scenes of the world. There must be some particular charm about it to produce such a consensus of opinion. I believe the explanation to be found in the fact that the temples at their present level harmonise so perfectly in scale, arrangement and position with the surroundings. The multi-axial setting out of the plan of the Temple of Isis gives to the elevation a play of light and shade exactly suited to the clear atmosphere and strong sunshine of Upper Egypt. I believe that any alteration in the present levels would destroy this artistic balance. I think archaeologists will agree with me, that from an archaeological point of view the temples would be valueless were they raised. It has also been suggested to rebuild the temples at a distance from the river bank and above the flood level of the reservoir. I do not think this need be discussed as the proposal cannot be seriously meant.

The origin of the reservoir schemes is so intimately bound up with the system of the irrigation of Egypt, that a descrip-

* A paper read at the meeting of the Society of Architects on June 12, by Major F. Seymour Leslie, R.E.

tion of the latter is necessary to a correct understanding of the former; in the same way the water supply of Egypt is so completely controlled by certain peculiar features of the Nile, that it will be necessary to also include these in the description. So as to keep within the time allowance, I shall limit myself to a general account.

The Nile, ranking among the first rivers of the world in length and catchment basin, has the least discharge, owing to the very dry and sandy region through which its central and lower part flows. It drains nearly the whole of north-eastern Africa. Its most important tributary, the White Nile, has its sources far south of the Equator, and after a course of over 2,200 miles to Khartoum joins the main stream, the point of junction being 1,864 miles distant from the sea. Lake Victoria, at an elevation of 3,574 feet above the sea, is the Nile's chief reservoir; it is on the Equator, and in the region of perpetual rains. After crossing the Ibrahimieh swamp, the White Nile enters Lake Albert, its second reservoir, at its north-east corner; there is a difference of level of 1,640 feet between the two lakes, Lake Albert being the lower of the two. Between Gondokoro and the mouths of the Gazelle river, a distance of 435 miles, occurs the region of living dams of vegetation, which completely block the river and regulate it during flood. Between Lake Albert and the junction of the Sobat, at a distance of 2,261 miles from the sea, many important tributaries join the White Nile; the Sobat itself is the most important of them all, having a discharge equal to that of the White Nile. The occasional drying-up in summer of this stream results in a low Nile in Lower Egypt. This branch of the Nile obtains the name White from the admixture of the waters of the Sobat, which carry down a whitish clay; above the junction they are green and slimy, with decomposing swamp vegetation. The Blue Nile should be considered the true Nile, for its flood brings down the rich volcanic mud which it has deposited during many ages in the Nile valley, converting sandy wastes into one of the most fruitful countries of the world. I have never heard an explanation of the name Blue, as applied to it; it may refer to its appearance when not in flood, as it is then comparatively clear.

A few miles south of Berber the Nile is joined by its last tributary, the Atbara, a torrential stream issuing from the Abyssinian mountains. From their confluence to the sea, a distance of 1,677 miles, the Nile flows alone, without any addition to its volume, and by human agency the Nile at this part of its course is made to part with its waters for the fructification of the soil of Egypt. About sixty miles north of Khartoum is the sixth cataract, the first of the series of rapids that ends with the first cataract. They divide the river, for a length of 1,236 miles, into alternate stretches of broken water and long deep reaches of comparatively smooth water. Both the rocky beds of the rapids and the deep reaches assist in retarding and regulating the flood. At Cairo, 110 miles from the sea, is the apex of the great deltaic formation of Lower Egypt; the Nile here divides into two branches, the Rosetta branch and the Damietta; these are the only two of the ancient seven that have not silted up and disappeared entirely. In past ages the Nile repeatedly overflowed its banks, and by deposits of mud formed mounds parallel to its course, which gradually slope away towards the desert. These mounds had an important effect in determining the particular system of irrigation adopted by the ancient Egyptians, for, had they been absent, this system would have been impossible. The last physical feature to state in connection with the Nile, viz. the annual flood or inundation, is the most important of them all, for without it Egypt could never have been an agricultural country. The heavy rains in the valley of the White Nile begin in April, and force down the unwholesome green stagnant water of the swamp regions. The time of the arrival of this water in Cairo varies from June 10 to July 10, according to whether the rise is late or early. The red muddy water of the Blue Nile follows from ten to twenty days afterwards, the rain beginning in Abyssinia about the middle of May.

The Atbara takes a month to saturate the desert and its own dry sandy bed; it then comes down in great volume, so that the rise of the Nile is rapid immediately after the appearance of the red water. At the beginning of the flood it takes twenty-five days to travel from Khartoum to Assouan, and twelve days from Assouan to the barrages at Cairo. At full flood these periods are respectively thirteen days and six days. The rains in Abyssinia cease about September 15, and the rivers, being of the nature of torrents, are the first to fall. The Nile reaches a maximum at Assouan about September 5, the maximum in Lower Egypt is generally about October 10; it would be at its highest about September 11 were the rise not retarded by the filling of the irrigation basins in Upper Egypt in August and September. They are not emptied and the water returned to the Nile until October.

The ancient Egyptians took skilful advantage of these different conditions to devise and carry out a very simple and effective system of irrigation that has been in operation for several thousand years down to the present time. It is known

as the basin system; to put it shortly, it consists in mapping out the land in terraced basins, separated from one another by lateral dykes. The levels above the sea of these terraces decrease in the direction of the flow of the river. The flood is admitted by cuts in the river bank, and passed on to a certain number of contiguous basins by similar cuts in the lateral dykes, filling the basins with even sheets of shallow water; it is then allowed to settle and deposit its mud, after which it is passed into a drainage canal, from which it flows back again into the Nile at a lower level than the district served by the drainage canal. This system was supplemented to a certain extent in Middle Egypt, and to a greater extent in Lower Egypt by shallow flood canals. Mohammed Ali, 1805 to 1849, made radical alterations in the irrigation of Lower Egypt; he destroyed most of the basin dykes, cut out deep summer canals on new lines and deepened some of the canals on old lines, with a view of producing summer crops of cotton. The experiment was not entirely successful; these deep canals ran shallow in flood, inundating the lands round the escapes, putting them out of cultivation. Some of them remain in that state now. An attempt was made to rectify this evil by constructing regulators; the canals then silted up between them and had to be kept open by expensive dredging.

In 1843 Mohammed Ali commenced the construction of the barrages or open dams across the two branches of the Nile at the bifurcation, with the view of maintaining a high-water level during summer for the feed canals of the Delta, whose heads are above the barrages. Owing to a faulty detail of construction and to settlements, they never operated successfully until quite recently, after extensive repairs. It is interesting to note a coincidence between the construction of the barrages and the proposed Philæ reservoir. Mohammed Ali ordered the demolition of the Pyramids to obtain stone for his works, but was persuaded to abandon the idea by a French engineer. We are proposing to virtually destroy Philæ, and another Frenchman, viz. the French commissioner, protests and condemns a reservoir at this place on account of the temples. Before we leave Mohammed Ali I will relate a tradition about him which I believe to be unrecorded—it was told to me by an Alexandrian boatman. This potentate one day witnessed an altercation between a butcher and a poor man. The latter complained that he had been given short weight, his complaint was found to be just, and the Viceroy caused one of his attendants to take the butcher's knife and cut strips of flesh off him, which were put into the scales until they balanced. From the foregoing account of the barrages, a reservoir in Upper Egypt would have been imperative as long as the barrages were unable to perform the functions for which they were designed, for the water passed into the river from the reservoir would not have risen high enough to enter the Lower Egypt canals. The repairs to barrages and the idea of a reservoir in Upper Egypt seem to have been concurrent; and Mr. Cope-Whitehouse initiated the reservoir schemes by discovering the Wady-Raian depression about 1886, and by formulating a project for a reservoir in it. His proposal was not favourably received by the Egyptian Government. The engineers of the irrigation department then proceeded to examine the course of the Nile with the view of constructing a dam in its bed. They found three suitable situations; the preference was given to one near the first cataract at Assouan. When it transpired that the island of Philæ would be submerged in the reservoir, the raising of the temples was proposed, with an alternative suggestion to rebuild them on the river bank.

Of the four situations proposed for the reservoir, the Wady-Raian is the most romantic, as it would provide a regulator in the neighbourhood of all that now remains of the ancient Lake Mœris, and the condition of Egypt in this respect, prior to the time of Amenemhat I., about B.C. 2466, might thus be restored. He is the earliest king of whom we have any record in connection with the Fayoum. He appears to have carried on reclamation works in this district, and the mounds of earth in the neighbourhood of the temple of Medinet-el-Fayoum may be fragments of his dyke. There is strong evidence that the Fayoum depression was Lake Mœris. Its formation is credited to Amenemhat III., 2300 B.C., but there are stratigraphical and other geological indications that both the Fayoum and the adjoining Wady-Raian depressions are natural formations, and that a movement of upheaval may have severed, or partly severed, the connection between the former and the Nile. One of the early kings may have restored this connection, and made the canal mentioned by Herodotus. Herodotus also records that the lake was artificially excavated, and that the spoil was thrown into the Nile and dispersed by that river; he also says that without difficulty he was led to believe this explanation of the absence of earth banks, as he knew by report that burglars had broken into a treasury at Nineveh by tunnelling, and disposed of the material excavated by throwing it into the Tigris. He lost sight of the fact that the latter was a simple mining operation and that the former meant mining 65,400 million cubic yards, thirty-one miles. This account is interesting, as showing that.

ancient travellers were as gullible, or as fond of improbable accounts of the wonders they had seen, as their modern prototypes, and that burgling is not a modern institution. An Arabic tradition ascribes the draining of the lake to Joseph. It is so thoroughly Oriental and interesting that you might like to hear it. It is a translation from an Arabic manuscript once in the possession of Cardinal Mazarin, and contributed by Mr. Cope-Whitehouse to the *Contemporary Review*, September 1887.

Joseph, to whom may Allah show mercy and grant peace, when he was Prime Minister of Egypt and high in favour with Raiyau, his sovereign, after that he was more than a hundred years old, became an object of envy to the favourites of the king and the puissant seigneurs of the Court of Memphis, on account of the great power he wielded and the affection entertained for him by his monarch. They accordingly thus addressed the king. "Great king, Joseph is now very old, his knowledge has diminished; his beauty has faded; his judgment is unsound; his sagacity has failed." The king said, "Set him a task that shall serve as a test." At that time el-Fayoum was called el-Hun, or the Marsh. It served as a waste basin for the waters of Upper Egypt, which flowed in and out unrestrained. The courtiers having taken counsel together what to propose to the king, gave this reply to Pharaoh:—"Lay the royal commands upon Joseph that he shall divert the water of the Nile from el-Hun and drain it, so as to give you a new province and an additional source of revenue." The king assented, and, summoning Joseph to his presence, said, "You know how dearly I love my daughter, and you see that the time has arrived in which I ought to carve out an estate for her out of the crown lands, and give her a separate establishment, of which she would be mistress. I have, however, no territory available for her except the submerged land of el-Hun. It is in many respects favourably situated. It is a convenient distance from my capital. It is surrounded by desert. My daughter will thus be independent and protected." "Quite true, great king," responded Joseph, "when would you wish it done? for accomplished it shall be by the aid of Allah, the all-powerful." "The sooner the better," said the king. Then Allah inspired Joseph with a plan. He directed him to make three canals; one from Upper Egypt, a canal on the east and a canal on the west. Joseph collected workmen and dug the canal of Menhi from Ashmunin to el-Lahun. Then he excavated the canal of el-Fayoum and the eastern canal, with another canal near it called Ben-Hame, to the west. In this way the water was drained from el-Hun; then he set an army of labourers at work. They cut down the tamarisks and bushes which grew there and carried them away. At the season when the Nile begins to rise the marsh had been converted into good cultivable land.

The Nile rose, the water entered the mouth of the Menhi canal, and flowed down the Nile valley to el-Lahun, thence it turned towards el-Fayoum, and entered that canal in such volume that it filled it, and converted the land into a region irrigated by the Nile. King Raiyau thereupon came to see his new province with the courtiers who had advised him to set Joseph this task. When they saw the result they greatly marvelled at the skill and inventive genius of Joseph, and exclaimed, "We do not know which most to admire, the draining of the marsh and the destruction of the noxious plants, or the conversion of its surface into fertile and well-watered fields." Then the king said to Joseph, "How long did it take you to bring this district into this excellent state in which I find it?" "Seventy days," said Joseph. Then Pharaoh turned to his courtiers and said, "Apparently it could not have been done in a thousand days."

Thus the name was changed from el-Hun, or the Marsh, to el-Fayoum, or the land of a thousand days. The last sentence is a pun on the name el-Fayoum; a thousand days is "elf vom" in Arabic, and the true derivation is the Coptic "el phiûm," the sea or lake.

The deepest part of the Wady-Raian depression is 131 feet below the sea level and 61 feet below the Nile; as a reservoir to supplement low Nile, it is calculated to be capable of retaining 2,000 million cubic metres, which is sufficient for the additional requirements for Lower Egypt only. The connecting canal between it and the Nile would have to cross the Bohr Yusuf; its probable cost is stated to be 2,700,000*l.*, and the annual cost of distribution from it 2,800,000*l.* It has not been recommended by the commission, on account of its costliness as compared with other schemes. As regards Lower Egypt it has the advantage of being near its work, and by keeping up the summer level in this district will admit of water being drawn off in Middle Egypt, which must now be allowed to pass down for use in Lower Egypt. The slopes of the Wady are virgin soil, so that there can be no sanitary objection to a reservoir there. From the archaeologists' point of view, it has the advantage of not destroying any ancient buildings.

The highest of the other three sites is at Kalabshi, about forty miles south of Assouan; this was not recommended on account of the great depth of water, which would make a dam at this place unsafe. The height proposed would have been sufficient for Lower and Middle Egypt; its foundation would be on granite. As far as I know at present, the reservoirs at Philæ will not store up more than the same amount. From an engineering point the site is said to be perfect. It is possible that enthusiasm on this account may have caused wider considerations to be lost sight of. A reservoir at Philæ to store sufficient water for Lower and Middle Egypt would tail off near Korosko, a distance of about 100 miles from its dam.

Several other interesting ruins besides Philæ lie within this range. It is expected that some of these will also be submerged. Silselia, about forty miles north of Assouan, is the position of the last of these dams; the river bed here affords a bad foundation of fissured sandstone and bands of clay. The reservoir would have flooded the recently-discovered temple of Kom-Ombos. A reservoir near the Kaibar rapids, a distance of 400 miles above Assouan, would benefit more country than any of the others. Those who know this part of the river well say that the river-bed here would give the best possible foundation for a dam, and that all the other requirements, such as shallow water and ample width, are also present.

Two very serious sanitary objections have been raised to the Philæ reservoir. It is said that the requirements of Lower and Middle Egypt will necessitate the free passage through the sluices of the reservoir of the best water as regards potability, and that when they would be shut down all the Blue Nile water would have passed, and the storage would consist of the unwholesome swamp water of the White Nile, containing the germs of all tropical fevers. The importance of this point will be felt when it is understood that the drinking water of Egypt is solely obtained from the Nile and its canals. Both banks of the Nile south of Assouan are thickly populated, and many villages with their accompanying cemeteries are situated on either side along the whole extent of the proposed reservoir; its waters will wash out these cemeteries and pass over ground that has been fouled by centuries of human occupation. These circumstances constitute the second sanitary objection, and those who have seen the unsavoury surroundings of an Arab village will appreciate its force. The riverside inhabitants of this part number about 30,000 souls who will have to be provided for. It is proposed to meet this difficulty by compensation. Compensation is not easy to obtain anywhere; in Egypt almost impossible. This district is also rich in other ancient remains, some of which may be submerged, and undiscovered ruins may lie buried beneath the soil. There seems great doubt as to the Powers consenting to a loan being raised to construct a reservoir; the temples may therefore yet escape.

CREDITON.

THE ancient town of "Kirtou" was a pleasant rendezvous for a large number of members and friends of the Exeter branch of the Church Defence Institution. The principal object of the excursion was, the *Devon and Exeter Gazette* says, to afford members an opportunity of inspecting the beautiful church of the Holy Cross. The Rev. Prebendary Smith, who has been vicar for more than forty years, kindly consented to describe the church, besides reading a paper on its history and the ecclesiastical connection between Exeter and Crediton. The visitors assembled in the lady chapel. The Rev. Prebendary Smith, after according a welcome to the visitors, said he was proud of the church where he had been so long vicar. He had watched the various improvements made in it with anxiety and interest, and he now felt that it was one of the grandest churches in the county. He was not quite clear, but he took it for granted that it was the ecclesiastical and not the civil history of Crediton they wished to hear about. The civil history of Crediton was very interesting, although unfortunately there were very few means of obtaining information on that head. Of its antiquity there could be no doubt, for they had authentic record of members being sent to Parliament at Carlisle in the thirty-fifth year of the reign of Edward I. Confining himself to the ecclesiastical character of the parish, he remarked that there was no doubt that Crediton was the first see of a Devonshire bishopric, which was established about the year 910. Before that time Wessex formed but one episcopal see, under St. Birinus, at Dorchester in Oxfordshire, which under Bishop Hedda was transferred to Winchester. Upon Hedda's death the diocese of Shireburne (Sherborne), which included Wilts, Berks and the counties of Dorset, Somerset, Devon and Cornwall, was taken from that of Winchester, an arrangement which continued in force for upwards of two centuries, when the Archbishop of Canterbury established the three separate dioceses of Cornwall, Devon and Somerset, and the Bishop of Devon fixed his see at Crediton, where it remained for 140 years. If the Bishop of Exeter should ever require a suffragan bishop he would take his title from Crediton. There were eight bishops of Crediton. Whether they were buried under that church he could not say, but he was much inclined to think that they were. Some years ago, when the outer walls of the north transept were being refaced, he discovered an arch which he was anxious that the governors of the church should have opened. Very probably they would have found a crypt and a number of stone coffins. The last Bishop of Crediton was Leofric, who, at his own request, was transferred to Exeter, and was installed in the year 1050 in the presence of Edward the Confessor and Editha, his queen.

That there was a Saxon settlement of Crediton nearly 200 years before it was chosen as a bishopric there was no doubt. After referring to the birth in the town about the year 680 of Winifrith, afterwards known as Boniface, Archbishop of Mainz and Apostle of Germany, he said it was impossible for them to say what the condition of the church was after Leofric's removal to Exeter. No Saxon remains had ever been found there, although they had been diligently searched for. Whether a body of clergy was left there after his departure could not be known; but there must have been one shortly after, as was testified by the existence of a charter of date prior to the Norman Conquest to the following effect:—"This is the charter of the land which is called Copulstan (the present Coplestone), which the venerable Priest Brithrie gave for the relief of his soul and the souls of his parents to the minister of St. Mary, which is in Crediton, for the maintenance of the canons serving God therein." The church appeared to have had two dedications—one to St. Mary and the other to the Holy Cross. It was doomed to demolition by Henry VIII., but saved from that fate by the zeal of the parishioners, who paid the sum of 200*l*. By a charter dated April 2, 1547, in the first year of the reign of Edward VI., the hereditaments and goods of the church of Crediton, the fabric itself, with all its appurtenances, were vested in twelve governors, who should have perpetual succession. All that ecclesiastical property, and the various privileges and responsibilities connected with it, which were vested in the twelve governors 350 years ago, appertained to their representatives at the present day. The lady chapel was used from the reign of Edward VI. to the year 1860 as a grammar school. In that year the school was built at the head of the town. The lady chapel is now used for week-day services and early celebrations of the Holy Communion. Referring to the architecture of the church, he drew attention to the large windows, remarking that no doubt at one time there was a great deal of stained-glass throughout the church, which would tend to lessen its present light appearance. They had only one stained-glass window now, but they were anxious to get the east window filled in. They had 300*l*. towards it. The cost would be 425*l*., and they found great difficulty in getting the remaining 125*l*. The vicar subsequently pointed out the many interesting features in the church and described their history.

INDIAN ART.

A GENERAL meeting of the Society for the Encouragement and Preservation of Indian Art was held on Monday at the Imperial Institute, under the presidency of Sir James Linton, P.R.I.

The report stated that the financial condition of the Society was not so flourishing as the committee could wish. The expectation stated in the last report that special generous donations would be forthcoming to provide a permanent fund for the heavier expenses of the Society had not been realised. There were two or three notable exceptions to this, for the Maharajah of Jeypore had most generously presented a sum of 100*l*., and two other maharajahs had sent 25*l*. each. These donations enabled the Society to take part in the World's Exhibition at Chicago and other exhibitions during the year, and to place before the public most worthy and beautiful specimens in many branches of Indian handicraft art, which otherwise would never have been seen. The committee hoped that many would be found to come forward and contribute generously in the interests of Indian art, and particularly of Indian artisans, whom the Society earnestly endeavoured to encourage.

Sir James Linton delivered an address, in which he said that, while claiming no great historical or technical knowledge of the industrial arts of India, he could not help having convictions as to the tendencies likely to prove disastrous to the native art of that great country. They had heard and seen a great deal of the endeavour to foster art in India; but the best policy to pursue was that of non-intervention, except for the purpose of preserving absolutely and entirely the national characteristics of Indian art. A friend of his who occupied an important post in India was commissioned to purchase in this country works of art and pictures, which were to be attached to the school of art from which he came. These were pictures of our modern European schools, and they were to be shown as examples worthy to be studied and imitated by the students of that school of art. The pictures purchased were principally landscapes representing places in England and Scotland. Fancy putting things like those before the people of India. Fancy expecting anything from the study of those works but disaster to Indian art. The Society should vigorously protest against such a misapplication of the liberality both of the governing bodies and of the citizens, because no art could flourish or ever be great, no art could by any possibility benefit humanity, that was not absolutely and entirely the result of a nation's individuality—the highest force and the only force that could originate and

carry through to the end a truly great art impulse. It was therefore absurd that we Europeans should insist that what was right for us was right for all, and should try to convert other nations, notwithstanding their racial differences, to our view.

Sir George Birdwood proposed a vote of thanks to Sir James Linton for his address, and also referred to the great debt of gratitude which the Society owed to Mrs. Carmichael, one of the hon. secretaries, to whom the success of the Society is very largely due.

THE PROTECTION OF ANCIENT BUILDINGS.

THE seventeenth annual meeting of the Society for the Protection of Ancient Buildings was held on the 16th inst. at the Old Hall, Clifford's Inn, under the chairmanship of Mr. J. T. Micklethwaite. The place of meeting was well chosen in view of the fast disappearance or remodelling of the old small inns. After the formal business of passing the report, the Chairman referred to the proposed destruction of one of the City churches—St. Ethelburga, Bishopsgate, which is one of the few remaining City churches which dates from before the Great Fire. It has been a good deal knocked about, but as yet has escaped the disgrace of a thorough restoration. A resolution protesting against this threatened destruction was proposed and carried unanimously. The paper of the evening was entitled "Protection and Production," by Mr. Heywood Sumner. By protection, he said, he meant the protection which the Society practised in regard to ancient art, while production is the production of new art. The protection was of two sorts—the preserving of ancient objects *in situ*, and in the second place, where this is not possible, their preservation in museums. This ancient art should be preserved, for it is the record of man. Like creation, it has neither speech nor language, but its voice has gone out into all lands. In addition it is not only beautiful in itself, but it has a power of recreation and inspiration, and from this recreation and inspiration we may learn something of how such work was produced and how such workers are trained, and what was the method of study. And it may be found that the workers were made through the system of apprenticeship, and learned their trade under the restrictions of real work absorbed through practice, and this Mr. Sumner held to be a vastly wiser process than the system of our days.

THE LATE W. CALDER MARSHALL, R.A.

IT is with regret we announce the death of Mr. W. Calder Marshall, R.A., which occurred on Saturday at his residence, 115 Ebury Street, Eaton Square. He was eighty-one years of age, and had been in failing health for some time. Mr. Calder Marshall was a native of Edinburgh. His father was the founder of that well-known firm of Edinburgh goldsmiths, Messrs. Wm. Marshall & Co., the business premises of which in its early days was in the North Bridge. The maternal grandfather of the deceased, after whom he was named, was William Calder, who was Lord Provost of the city in the early years of the century.

Born in 1813, Mr. Calder Marshall (the *Scotsman* says) was educated at the High School and the University. He became a sculptor, an art for which he had shown a decided predilection, and studied under the famous Chantrey and the almost equally well-known Bailey. Still further to forward his professional education, he went to Rome, where at that time the influence of Canova and Thorwaldsen was in the ascendant. By the works of both of these eminent sculptors he was greatly influenced, for although he early broke away from the convention of Canova, and introduced into his work a more naturalistic and modern feeling, he continued to the end a classicist—more moved by the graceful type than by the delineation of individual feeling or character. He practised his profession for some time in Edinburgh, removing to London in 1839, where he early took a good position in the world of art, and retained it until the close of his life.

Mr. Calder Marshall was elected an Associate of the Royal Scottish Academy in 1840, and of the Royal Academy in 1844, and he became a Royal Academician in 1852. He resigned his Associateship of the Scottish Academy when he was elected to the Royal Academy. In 1861, as a recognition of his merits, he was elected to the hon. membership list of the Royal Scottish Academy. Mr. Calder Marshall's sympathies were all on the side of ideal art, and his groups or single figures selected from Greek and Roman mythology, or from ancient history, were always well composed, graceful in form and dexterously executed. *The Broken Pitcher* was completed in 1842 for the Art Union, the subscribers of which frequently did him the honour to select replicas of his works for prizes. His *First Whisper of Love* was the first Art Union prize in 1845; *The Dancing Girl Reposing* obtained the Art Union premium

of 500*l.*, and of it reduced copies in Parian were distributed among the subscribers. His *Sabrina*, a water nymph, was another famous figure—one of the best, some of his friends thought, that he ever did—and it had a wide circulation in the shape of a porcelain statuette. For the Houses of Parliament Mr. Calder Marshall executed the statues of Lord Clarendon and Lord Somers; and from his studio came also not a few statues of public men, erected in London and other English towns. The bronze statue of Sir Robert Peel at Manchester is his, as also the statue to Jenner which formerly stood in Trafalgar Square, and is now re-erected in Kensington Gardens. Among his other works may be mentioned the statues to Crompton, the inventor of the mule spinning machine, in Bolton; to Sir George Grey in Cape Town; and to James, seventh Earl of Derby, for the spot on which that nobleman was executed at Bolton. In the great competition in 1857 for a national monument to the Duke of Wellington, in which artists from many countries competed, Mr. Calder Marshall had the distinction of receiving the first prize of 700*l.* But while this was so, the monument was actually erected from other designs, though Mr. Calder Marshall executed some of the bas-reliefs in the side-chapel in which the memorial was placed. He was chosen to execute the large group symbolical of *Agriculture* at the base of the Albert Memorial in Hyde Park, and another honour conferred on him was his appointment as a member of the Royal Commission to represent British and Colonial exhibitors at the International Exhibition held at Paris in 1878. In recognition of his services then he was made a Chevalier of the Legion of Honour.

One of the best busts Mr. Calder Marshall ever executed was that to the poet Rogers, of whom he was a friend. Though he was a frequent exhibitor at the Royal Scottish Academy, we are not aware that he ever received a commission to execute any public statue north of the Tweed. He, however, in 1854, presented a grand example of classical sculpture to the Royal Scottish Academy, called *Ajax Praying for Light*. This colossal figure, which stood for many years in the vestibule of the Academy, is now in the Museum of Science and Art, Chambers Street, on a loan from the Academy.

A few years ago, when failing health prevented further work being done, Mr. Calder Marshall went upon the retired list of the Royal Academy, and about the same time he, with great public spirit, distributed the casts of his chief works among several of the museums of the country. A number went to the Crystal Palace, others to Manchester, and others to the Museum of Science and Art, Edinburgh, where some of them constitute a prominent adornment of the outer hall. Among others there which may be mentioned are his *Eve*—a nude female figure seated on a bank looking at the serpent on the ground beside her; *Deborah* (1842)—the Jewish heroine singing her immortal song of victory; *David*, an admirable semi-nude figure of a youth leaning on the sword of the giant whose head lies at his feet; and a thoughtful statue of Chaucer, the father of English poetry, arrayed in a long robe, and having pencil and book in his hand. Inside the Museum is the *Ajax* already referred to—a grandly-modelled figure of a warrior; a spirited group, called *The Young Briton*—the early British mother teaching her boy endurance being of a gracious type—and the *Prehistoric Artist* carving with an iron tool a mammoth's tusk. These works are very representative of the trend of the art of Mr. Calder Marshall, and of the ability which he put into the execution of all that he did.

As a man Mr. Calder Marshall was of a quiet and reticent demeanour, but he was widely respected by a large circle of friends, not less for his artistic qualities than for his upright life. Mr. Calder Marshall was a lifelong friend of the late Allan Fraser, and he was a trustee under his will in connection with the scheme for promoting the education of Scottish artists, which, however, has not yet taken shape. The deceased is survived by a daughter and two sons, one of whom, Mr. Charles J. Marshall, is an architect in London. Three of Mr. Calder Marshall's younger brothers are well-known Edinburgh citizens.

THE CHAPEL ROYAL, HAMPTON COURT.

THE Chapel Royal at Hampton Court is about to be closed for a period of three or four months, while some extensive alterations are carried out. The alterations consist chiefly in the removal of sixteen windows, and their restoration in the style in which they were originally. The windows are now very plain, and filled in with ordinary glass. A short time ago an old window, which had been blocked up and concealed for a great number of years, was discovered over the altar in its original state. In the time of Henry VIII. the windows were filled in with stained and ornamental glass, but this was all destroyed by the Puritans in 1645, orders being given that they should be "newly glazed with plain glass." This was done, and since that time no attempt has been made to revert to the original style. It is intended to restore the mullions and tracery, and insert tinted glass. Six of the sixteen windows

are to be similar to those in the great hall, and will contain the heraldic badges of Henry VIII.—the Lion, the Portcullis, the Fleur-de-lys, the Tudor Rose, the Red Dragon of the House of York, and the White Greyhound of the House of Lancaster—with mottoes running obliquely across. The chapel will be used for the last time before the alterations on Sunday next, and while it is closed the services will be held in the great hall.

THE ROYAL ACADEMY AND LITHOGRAPHY.

THE following letter from Mr. George Thomson appeared a few days ago in the *Times* :—

If I may claim the hospitality of your columns, there is a matter touching a recent decision of the Royal Academy and its treatment of artists which, insignificant enough in itself, is of such importance in principle as deserves, I think, some public notice. I refer to, and here protest against, a proposition which the President and Council appear to have made to themselves—that examples of the art of lithography shall be deemed inadmissible to their exhibitions. This reactionary decision is the more to be deplored, as it constitutes a reversal of the larger policy which formerly prevailed. For lithographs were at one time frequent in the Royal Academy, as may be seen by any one who searches catalogues of the "fifties" and the "sixties" under the names of Lynch, Vinter, Maguire, Lane and others. I do not know when the new policy was initiated, but I may say that a lithograph has appeared in the Academy so recently as 1892. This was a reproduction by Mr. Thomas Way from Mr. Whistler's portrait of his mother, and some of your readers may remember the work. The print, it is true, was not described as a lithograph, and it is possible that it was hung in academic ignorance.

This matter is of special interest at the present moment, when effort is being made by a number of painters to revive this beautiful art as a mode of original artistic expression. The lithographic stone presents facilities for conveying some artistic qualities much valued at the present time. The most autographic of drawing and printing processes, with qualities and limitations peculiarly its own, its possibilities have been little more than suggested in this country. While claiming no superiority, I admit of no inferiority in capable hands to either plate or wood-block printing.

My second complaint, of smaller general interest perhaps, is of the incivility, as it appears to me, of the Academy in this, that having refused my work—a lithograph—upon a rule not hitherto known or published, so far as I can ascertain, it has completely ignored repeated application for an explanation. And this, sir, though of little moment to the majority of your readers, should be of some concern to the general body of artists, on whose co-operation the success of the Academy so largely depends.

The circumstance which is the occasion of my complaint may be gathered from the following particulars and correspondence. It happened that I submitted to the selecting committee of the present exhibition a lithograph—a slight thing in itself—drawn, printed and entirely executed by myself. Some three weeks afterwards I received the communication given below, and thereafter addressed to the secretary the inquiries which follow :—

"Royal Academy of Arts :

"(Post-mark 23) April, 1894.

"Sir,—I am desired by the President and Council to inform you that the work sent in by you for exhibition, being a lithograph, is inadmissible, and to request you to remove it as soon as possible.

"Your obedient servant,

"G. Thomson, Esq.

"FRED. A. EATON, Sec."

"Strand-on-the-Green, Chiswick, W. :

"April 24, 1894.

"Sir,—I am in receipt of your communication with reference to a work which I submitted to the selecting committee for exhibition at the Royal Academy. In this letter I am informed that, 'being a lithograph,' my work is inadmissible.

"I have searched the instructions issued to intending exhibitors, and find no reference whatever pointing to lithography as a means of artistic expression which is excluded from the exhibitions of the Royal Academy. I am therefore at a loss as to the meaning of your communication; and as this decision of the President and Council, so far as I know, is quite unprecedented, I think that I am entitled to an explanation. I should be greatly obliged if you would inform me upon what grounds or under what rule drawings printed by this particular means are inadmissible at the Royal Academy.

"I am, Sir, yours very truly,

"GEORGE THOMSON.

"Fred. A. Eaton, Esq., Secretary to the Royal Academy."

"Strand-on-the-Green, Chiswick, W. : May 10, 1894.

"Sir,—I wrote a letter to you about two weeks ago, in which I asked to be informed under what rule a lithograph submitted by me had been adjudged an inadmissible work. I

have had no reply to my question, and I now write to ask if I am to be favoured with an answer.

"I am, Sir, yours very truly,

"GEORGE THOMSON.

"Fred. A. Eaton, Esq., Secretary to the Royal Academy."

Neither of these letters has been answered, though six weeks have now elapsed. And certainly it is not for me to open further communication.

I do not pretend that the revival of lithography will suffer mortal hurt for being snubbed by the President and Council of the Royal Academy. Other forms and phases of art have similarly suffered, to find their refuges elsewhere, and even now the art of lithography receives due encouragement upon the other side of Piccadilly. But is it too much to ask that the Academy should plainly publish all its rules and treat intending exhibitors with common courtesy?

There is a minor circumstance worthy, perhaps, of mention, which enriches the ludicrous element in this affair. There is marked upon the back of the frame by the Academy official the word "inadmissible," and partly obliterated, the letter "D." This letter in academic significance implies that the work had been provisionally accepted for exhibition; that, provided space were found, it would have been included in the exhibition. The "D" or "doubtful" class forms the bulk of an Academy show in the proportion, it is said, of nine out of ten exhibited works. An offending picture, therefore, can clearly carry its condemnation, not upon its face, but on its back—in the written description of the author. It may be good to the academic mind in itself, but bad because it is a lithograph.

NILE RESERVOIR AND TEMPLE OF PHILÆ.

IN a letter to the editor of the *Times*, Mr. R. Hamilton Lang writes:—Permit me very briefly to suggest that there is one point in the case "Nile Reservoir *v.* Temple of Philæ" which is not satisfactorily proven by anything yet published on the subject.

I am ready to admit that the storage of a certain quantity of water by means of a reservoir is necessary for the progress of the material interests of Egypt, and I accept without hesitation the opinion of Sir Benjamin Baker that the Assouan reservoir is best adapted to store with safety the enormous volume of water for which Mr. Willcocks provides, but nothing which I have yet read has convinced me that the reasonable requirements of Egypt necessitate the construction of a reservoir of the dimensions proposed.

The importance of this point need not be dwelt upon. It is evident that, although a reservoir carrying 22 mètres head of water may submerge the Temple of Philæ, one of 12 or 15 mètres head of water may not do so. And if it can be proved that a reservoir of the smaller dimensions will amply suffice for all the probable wants of Egypt during the next 15 or 20 years, then I venture to submit that it would be unjustifiable to destroy the Temple of Philæ.

Sir Benjamin Baker tells us in his article in the *Nineteenth Century* for May that the proposed reservoir will increase the supply of water at low flood by an amount considerably larger than the supply which is now available. In other words, the reservoir in its projected dimensions will provide for a summer culture more than double of what now exists in Egypt. Roughly speaking, the present summer culture of Egypt may be put down at 1,400,000 acres. The projected reservoir provides for that area being raised to 3,000,000 acres. I make bold to say that twenty years hence Egypt will not have increased that area to 2,100,000 acres, and if she attains this latter figure she will have made marvellous progress.

It would make this letter too long to explain fully all the reasons which lead me to make the assertion that an increase of 50 or 60 per cent. in the present supply of water for summer culture is largely sufficient for the requirements of Egypt during the next twenty years, but if the question is to be seriously examined I am ready to give them.

Meantime I think it is fair to ask Sir Benjamin Baker kindly to inform us what are the dimensions of a reservoir at Assouan which would not submerge the Temple of Philæ. Enlightened upon this point, it would be reasonable to consider whether the volume of water thus secured is not a sufficient present boon to give to Egypt. The opinion of Sir Benjamin Baker on another point would also be grateful, viz. given the volume of water to be half of what Mr. Willcock's scheme proposes, would a reservoir at Silsileh instead of Assouan not be feasible?

Fifteen or twenty years hence the facilities of Egypt for storing water may be much greater than they are to-day, for the reoccupation of the Soudan may afford sites for storage superior to those now available. Personally I also attach considerable importance to the suggestion of Mr. Garstin, that possibly it may be found that the natural depressions known to exist at various points on the course of the Nile may be utilised for the storage of water at a comparatively small cost. Further,

Upper Egypt or perhaps the southern half of it might receive its supply from a canal similar to the Ibrahimieh Canal in Middle Egypt and drawing its supply above the action of the reservoir, and this would be especially easy were the reservoir situated at Silsileh. In fact, there are so many possible ways of increasing, whenever it is desired, the water supply that no risk is run in limiting the reservoir now projected to the probable requirements of Egypt during the next twenty years, and if by such a limitation the Temple of Philæ could be saved all lovers of that beautiful monument of the past would be grateful.

WORKHOUSE SCHOOLS.

AT the last meeting of the Chorlton Board of Guardians a report of a sub-committee of the house visiting committee, appointed on January 10, in reference to the removal of the school children from the vicinity of the workhouse was adopted. It stated the subject of the removal of the children from the proximity of the workhouse has at various times received the consideration of the guardians, and although it has on every occasion been thought most desirable, difficulties have arisen which have hitherto prevented the attainment of this desirable object. The present time, however, seems opportune for carrying out this needful scheme, as, unless the children are removed, further provision will have to be made for giving additional accommodation, both to the body of the house and also to the lunatic wards. The following resolution was adopted on January 10, when the sub-committee was appointed:—"That, with the object of providing additional workhouse accommodation, the children at present in the workhouse schools be removed into the country and cottage homes provided for them, and that the present school buildings be utilised as lunatic wards and the present lunatic wards be added to the body of the house." The first thing to be considered was as to the system; whether it should be cottage homes such as exist at Leicester, Birmingham, Swansea and other places, or cottage homes as recently introduced by the Sheffield Guardians. "Sheffield was accordingly visited, the arrangements and details of the homes examined, and, though we felt there was much to admire in the innovation, yet we could see that unless the scheme could be worked, and worked always, under the most favourable conditions possible, it was open to very grave objection, and we were reluctantly forced to the conclusion that we could not recommend its adoption to you. For the number of children always likely to be chargeable to this union there would appear to your sub-committee no better plan for dealing with them than in cottage homes such as are found at the places mentioned. This being the case, the site of the proposed homes was our next consideration. Advertisements were inserted in all the local and neighbouring papers and applications made to almost the whole of the estate agents in the vicinity, inviting offers for sufficient land for the erection of such homes, in answer to which some fifty plots were submitted to us, and after inspection and careful examination we are now prepared to recommend less than half a dozen to you for selection. And so that we might be in a position to recommend to you the most modern of recent erections we consulted the Local Government Board, who expressed the opinion that the Leicester, Birmingham and Swansea schools were the best. Several members of the sub-committee visited these places. In conclusion we recommend (1) that the sites selected by your sub-committee be visited by the whole Board; (2) that in our opinion the Leicester Cottage Homes are best adapted to serve as a model where new schools are required by a union similar to Chorlton, but with a less expensive style of architecture."

ST. MICHAEL'S CHURCH, LINLITHGOW.

A PARTY of members of the Glasgow Ecclesiological Society recently visited the church of St. Michael, Linlithgow, at present in process of restoration under the direction of Mr. John Honeyman. Mr. Honeyman being unavoidably absent sent the following notes, which were read after the members reached the church, viz.:—"Mr. Honeyman had suggested a visit to St. Michael's Church that they might get some idea of the great beauty and importance of the building. He hoped that on some future occasion, when the operations now in progress were further advanced, they would revisit the church and devote a day to its examination. Meantime he had no doubt that even a passing look into it would greatly interest them and induce them to help on the work if it should be in their power to do so. Fortunately the fabric was in a good state of preservation generally, but when the parish church was transferred to the east end, nearly a hundred years ago, an immense amount of damage had been done in a most reckless manner, and to repair that damage required more funds than the committee had been able to raise in the locality, but he had no doubt the amount required would be forthcoming if the national importance of the work was fairly brought before

wealthy Scotsmen throughout the country, and he would venture to say throughout the world. When the partition wall was erected at the west side of the transept the chancel arch had been deliberately taken away and the responds cleared off, so as to allow one or two more people in the end gallery to see the minister, and the piers of the chancel were seriously injured by the rests for the gallery beams being cut right through the pier. The repair of these piers is the chief structural difficulty, but the holes in the responds and in the walls are easily managed, and are already partly restored. They would observe that the floor of the nave had been raised to the same level as that of the chancel. They proposed restoring it to its original level, which would cost a good deal, but he was sure they would agree with him in thinking it a most proper change. Then they would notice that while the aisles have stone vaulting of very simple and elegant design, the nave and chancel have sham vaulting of stucco. This was abominable in every way and seriously affected the proportions of the building. There would be no difficulty in dealing with it effectively if only they had plenty of money, but failing this, he was almost inclined to think that it would be advisable to sweep the whole away and expose the rough king-post roof which is above it. The nave was never designed to have anything but a wooden roof. The piers are slender and the span is wide—wider than Glasgow or even St. Andrew's. The building was exceedingly valuable as an example of Scottish architecture of the fifteenth century. It was a harmonious and graceful design, and he thought by far the finest church of the period now remaining in Scotland." A hope was expressed by those present that liberal contributions would be forthcoming, so that the minister of the parish and the architect would not be hampered in their efforts to restore this ancient and historic sanctuary to something like its former beauty and splendour.

THE TRON STEEPLE, GLASGOW.

IN few cities of Great Britain, says the *Glasgow Herald*, is the past less conspicuous in the present than Glasgow. Although, to those who know their native city well, there are in almost every street east of Buchanan Street houses which have their history—and some of them have strange histories—yet there are not many which architecturally have any claim to notice. The old city of Glasgow was a very small place, and long ago consisted of little more than one straggling street, running from the cathedral to the Clyde, with branches westward. As every one knows, the Bishop's Castle stood where the present infirmary stands, and in the neighbourhood were the houses of the various canons of the cathedral. There were gardens around those houses, and the Molendar, then a clear stream, flowed down to the equally clear and fish-thronged Clyde. The town was for many a day celebrated above all for the clearness and salubrity of its atmosphere. Of the buildings which formed the little episcopal city few traces remain—in the first place because great fires from time to time ravaged it, and in the second place because, when the influence of trade began to work, the old buildings were rapidly modernised. Even Hamburg, which is supposed to be the least romantic of all Continental cities, far outvies in picturesqueness anything that Glasgow can show. Still the city has none of the wearisome monotony which characterises the plan of American towns, and there still remain some reminders of former days in the three towers which in somewhat unexpected places show themselves amidst the bustle of the working-day world. Of the three none is better known to Scotsmen than that of the Tron Church, which has at present secured the doubtful honour of being the subject of a vote in the Town Council.

In olden times near the west port of the city there was a tract of ground associated from remote antiquity with St. Thenaw, the mother of St. Kentigern, and the approach near to it was known as St. Thenaw's gate. There was, we think, a small chapel there, and there was certainly a St. Thenaw's burn, one of the numerous rivulets which then crossed the fields west of the Cross, now covered by Tron Gate, Argyll Street, and the western portion of the city. It is scarcely necessary to remind readers that the name of St. Thenaw became corrupted into the present form of St. Enoch—a saint unknown to any calendar. In 1525 Gavin Dunbar, Archbishop of Glasgow, gave his consent to Master James Houston, vicar of Eastwood, founding a church "to the Lady Virgin Mary of Loretto and St. Ann her mother" on the south side of St. Thenaw's gate; and by the courtesy of Mr. Renwick, of the town clerk's office, the present writer has been permitted to examine the original document, which still bears in excellent preservation the archiepiscopal seal.

The archbishop had only been eight months in his office when this deed was executed, for he succeeded Archbishop Beaton upon the translation of the latter to St. Andrews, and came fresh to Glasgow from his office as tutor to King James V. The provost and bailies were not slow to encourage the pious

ardour of James Houston, the founder of the new church, and in 1529 they granted a charter giving, in honour of the Virgin Mary and her mother, and to the said Master James Houston, and to the eight chaplains of the church, sixteen acres of land on the east side of Glasgow, commonly called the Gallowmuir, of which sixteen acres eight lay on the south side of the muir between the lands of Barrowfield on the south and the common muir on the west, and the remaining eight acres upon the north side of the muir, adjacent to the lands of the Sub-dean of Glasgow, commonly called the Wester Craigs, and the town's muir on the west and south portions and the lands of the treasurer of Glasgow on the east parts, to be holden of the town in free gift for prayers, &c. This charter was confirmed by Archbishop Dunbar ten days after its execution by the provost. In subsequent years the lands were reconveyed to the city. Ten years after the archbishop's confirmation Master James Houston, now described as "Sub-dean of Glasgow, founder of the Collegiate Church of Saint Mary the Virgin and Saint Ann her mother, otherwise called Our Lady College," executed a deed whereby he appointed the Lord Rector of the university and the Dean of the Faculty of Arts visitors of the collegiate church aforesaid, and bequeathed certain yearly sums to be paid to them for making such visitations. According to most of the local histories, the church itself was not built until 1540, but we are inclined to think that this must be erroneous in view of the above documents. It is also clear that when reference is made (as in some cases) to the dedication of the church to "Saint Mary and Saint Michael," there must surely be some error. At all events, the church soon lost its name, and from the fact that the Tron, or weighing machine by which were weighed the goods of the persons coming into the city, was situated at the gate adjoining, it became known by the name the present church still bears, viz., that of the Tron Church. The church was but a new building when Cardinal Beaton, the city's former archbishop, was murdered in St. Andrews, and although the years between his death (1546) and 1553 were the breathing time of the Church, the ecclesiastical decay had already spread far. It is a fact which cannot be too often insisted upon that the ruin of pre-Reformation ecclesiastical edifices was due rather to the indirect than the direct action of the reformers. The number of churches which were wrecked is small, but the number of churches which were allowed to fall into decay, owing to the alienation of the revenues by which they were supported, is considerable. It would be out of place here to refer in detail to the curious and indefensible alienations of ecclesiastical property, which were not less numerous in the West of Scotland than elsewhere. But the fact itself should be borne in mind. The Reformation in Scotland is generally stated to have taken place in 1560, although there is considerable room for doubt whether the Protestant ascendancy was completely established for a considerable period afterwards, except in districts where the reformers were in a decided majority. The churches in Glasgow seem to have suffered like the churches elsewhere from the want of funds to keep them in repair, and in 1568 we find the kirk-session ordering the master of the college to repair the Blackfriars Kirk, a repair which must have been limited to the fabric of the edifice, because, the church having been already swept of pre-Reformation altars, there could be little or no furniture in it. Even in the cathedral, as appears from an order of the kirk-session in 1589, there were only forms for the men, the women being enjoined to bring stools with them if they required seats. In 1592 the ruined state of the Tron Church attracted public attention, and it was ordered to be repaired for public worship. Its first minister was John Bell. The present steeple was built in 1637; and it is therefore about ten years younger than its neighbour, the Tolbooth steeple, at the north-western corner of the High Street and Tron Gate.

The Tron Gate Tower was just a year old when the most notable event which ever took place in Glasgow, the meeting of the General Assembly in the cathedral, brought together a most remarkable crowd of peers, magistrates, barons, burgesses and ministers. Scarcely a notable man in Scotland was absent from the General Assembly of 1638, and a special gallery was set apart for young noblemen who were not members of the house. This was the famous assembly which, undeterred by the withdrawal of the Lord High Commissioner, proceeded to the trial of the Scottish bishops, and deposed them all, not merely from their bishoprics, but from the office of the ministry; while, in addition, it excommunicated eight of them. It sat from November 21 to December 20. Then, as now, the provost (not yet a lord provost) was a Mr. Bell. The provost was not unaware of the delicacy of the proceedings within the High Kirk, and frequently placed the position of matters before his colleagues and craved their advice. On November 29 he desired to know whether, the Lord High Commissioner having withdrawn, the Assembly should continue to sit, and the Town Council instructed him to vote that the Assembly should proceed with its business. A week later he asked for instructions on such comprehensive subjects as the deposition of the bishops;

the abjuration of episcopacy, the abrogation of the previous Assemblies, and sundry other little matters, and by a majority the Council instructed him to vote for all such things.

The old Tron Church, which had begun its existence as a collegiate and Catholic foundation, survived until 1793, when it came to an untimely and entirely unexpected end. The session-house had long been in use as a meeting-place of the presbytery of Glasgow, but the economical citizens having determined that it should be contrived a double debt to pay, the ministers of the morning were replaced in the evening by the city guard, a body at that time of more or less amateur police or vigilance committee, who took duty by rotation. It appears that the watch left the session-house at three o'clock in the morning of February 15, 1793, by which time it was probably anticipated that even the exuberant spirits of Glasgow youth would have had time to cool down. They were, however, greatly mistaken. As it happened, the members of a society of disciples of Tom Payne, who were designated the Hell Fire Club, were on their way home when they observed the cheerful blaze of the guard-house fire, and made their way into the session-house. According to Dr. Mathie Hamilton, "while warming themselves at the fire and indulging in jokes against one another as to their individual capacity to resist heat, with reference to an anticipated residence in the headquarters of the club, they placed what inflammable matter there was at hand on the fire to increase it, and ultimately having, in bravado, wrenched off and placed some of the timber of the session-house on the ignited mass, they could no longer endure the heat, and fled in dismay from the house, which contained much dry wood, as it was seated like a church. It was soon a mass of fire, and the flames caught the church, which was totally destroyed in a terrific conflagration, so that on the north side of the Trongate, between it and Bell Street, where Antigua Place in Nelson Street now is, a quantity of hay in stack was with difficulty saved from the embers which were wafted through the air from the blazing church. The steeple, however, escaped all damage." In 1794 James Adam, the architect of Glasgow Infirmary, was instructed to prepare plans for the erection of a new church, which is now almost for the first time exposed to the citizens' view by the destruction of the tenements which formerly obscured its somewhat unsightly appearance.

It has been mentioned above that the Collegiate Church of Our Lady and St. Ann had early acquired the name of the Tron Church from the proximity of the weighing machine. Latterly the tron itself was located in the street chamber of the tower, until the progress of time having rendered the arrangement antiquated, the chamber was arched and a free pathway provided along the pavement of the busy thoroughway on which the tower stands.

During its long watch of over two centuries and a half, the Tron Steeple has seen many a change pass over Glasgow. Built when the little city was only beginning to emerge from the Mediæval Ages, which lingered longer in Scotland than in England, under its shadow have passed all the generations of citizens who have built up the commercial fame of Glasgow. It has seen the tobacco lords of Virginia majestically tread the "plane stanes" in their scarlet cloaks, and their more sombrely-clad successors, busied in other pursuits which have brought wealth and honour to St. Mungo's city. Formerly it stood in the very midst of the social life of the citizens, for there were few of the many social clubs for which Glasgow was famous that did not meet in the inns of the neighbourhood. Now it stands, a record of former days, adding picturesque antiquity to a street which otherwise is entirely modernised. Such projecting towers add much to the fame of the streets of Nürnberg and Ratisbon, but on the Continent they were in most cases built as defensive adjuncts to the dwellings of the local barons who dominated the burghers. In Glasgow no such gloomy associations cling to the tower, the demolition of which is so lightly proposed, and it is to be hoped that nothing will be hastily agreed to which will deprive the city of a time-honoured landmark.

THE HELLENIC SOCIETY.

THE annual meeting of the Society for the Promotion of Hellenic Studies was held on Monday. Professor Jebb, M.P., who presided, in moving the adoption of the Council's report, gave a short account of the more important discoveries that have been made in Greek archæology during the past year. The French archæologists at Delphi have found, among other things, the treasure-house of the Athenians (which was built soon after the battle of Marathon), and marble slabs containing the now famous hymn to the Delphian Apollo. Of this there are fourteen fragments in all, the principal one containing some eighteen lines. The musical notes are denoted by letters which are sometimes tilted or turned upside down in order to supply more symbols. The clue to the interpretation of these is found in a Greek writer named Alypus, who dis-

tinguishes two systems of notation, one for voices and the other for instruments—presumably the lyre and flute. There are specimens of both systems among the Delphian fragments. The date of the hymn is thought to be the third century B.C., and it is the most authentic and extended piece of Greek music as yet known. The British School at Athens have been investigating the course of the aqueduct in connection with the spring Callirhoe. In Cyprus the trustees of the British Museum have undertaken the excavation of the necropolis of Amathus, while German explorers have been working in the plain of Troy. Professor Armitage Robinson has been searching for Greek manuscripts in Constantinople. In the library of St. Sofia he found none, but in another library he discovered about forty, which, however, do not seem to be very valuable. Mr. Ernest Gardner, in seconding the report, gave some particulars about the damage caused to antiquities in Greece by the recent earthquakes. The Parthenon seems to have suffered considerably. In the ballot for members of the Council for the ensuing year the official candidates were elected unanimously, and the proceedings closed with a vote of thanks to the Chairman.

GENERAL.

Professor Banister Fletcher has declined to contest Rochester at the next Parliamentary election, on the ground that his work will prevent his giving the necessary time.

Lord Waterpark has refused an offer of 95,000*l.* for his Derbyshire seat, Doveridge Hall, which has been for some time in the market.

Eleven Pictures recently presented to the Dudley Art Gallery have been placed among the permanent collection. *Market Girls*, a Brittany study, by H. H. Robinson, exhibited in the Academy in 1886, was purchased for the gallery by Messrs. C. H. Palethorpe and A. G. Hooper. The other pictures—ten in number—form a legacy by the late Mr. Richard Hopkins, of Emscote.

The Art Collection at Guildhall will close on Sunday, July 1. Nearly two hundred and fifty thousand persons have up to now visited it, and the gallery continues to be thronged daily. It is acknowledged to be the best collection which the Corporation has yet been able to gather together.

An Anonymous Donor has contributed 2,000*l.* for the cost of one house at the Royal National Hospital for Consumption, Ventnor, in memory of two daughters who died from consumption.

A Memorial of Barye, the French sculptor, consisting of a medallion portrait with representations of some of his works, was unveiled on the Ile St. Louis, Paris, on Monday.

A Design by Mr. J. A. Eggar has been adopted for the school in East Street, which is to be erected by the Farnham School Board. Premiums were awarded to Mr. Paxton Watson and Mr. A. J. Nash.

An Exhibition of ecclesiastical and educational art will be held in Exeter during the Church Congress, from October 8 to October 12.

The Photographic Salon will be opened for the second time in the Dudley Gallery on October 1, and will not be closed for a month. The exhibition will be confined to "pictorial photography in which there is distinct evidence of personal artistic feeling and execution."

The Estate of the late Colonel William Haywood, engineer to the Commissioners of Sewers, has been sworn at 42,606*l.* gross value and 29,957*l.* net value.

Mr. Leader Williams, the engineer of the Manchester Ship Canal, has received a letter from Lord Rosebery intimating that he is to be knighted in recognition of his engineering services.

Tablets, with portraits of Leopold Ernest, who was architect in charge of St. Stephen's, Vienna, from 1852 until 1862, and of Friedrich Schmidt, who held the same office from 1863 until 1891, have been set up on each of the south portals of the church.

Mr. William Hart, the American landscapist, died in New York on Sunday, in his seventy-first year. He was born in Paisley, but has lived in the United States since 1831.

Mr. Delissa Joseph is the architect for the schools and minister's house in connection with the Hammersmith and West Kensington Synagogue, the foundation-stones of which were laid last Sunday by Mr. B. L. Cohen, M.P., when the Chief Rabbi officiated.

The Marquis of Lothian on Wednesday evening presided at the annual dinner of the Artists' Benevolent Fund.

The Death is announced of Mr. Andrew Maitland, the senior partner of A. Maitland & Sons, architects, Tain, in his ninety-second year. For the last half-century he was a prominent figure in Ross-shire.

The Architect.

THE WEEK.

THE meeting of the Institute of Architects on Monday was characterised by something rather exceptional, as the chief interest centred on two such eminent men as Mr. F. C. PENROSE, the newly-elected President of the Institute, and Sir FREDERIC LEIGHTON, the President of the Royal Academy. That so accomplished an artist should receive Her Majesty's gold medal from the hands of such a veteran in art as Mr. PENROSE was a circumstance none the less pleasing because it was fortuitous. However proud we are of Mr. PENROSE as an ornament to the profession which he has so worthily and assiduously served, the estimation in which he is held abroad scarcely is second to our own appreciation. Sir FREDERIC LEIGHTON, in returning thanks for the honour conferred on him, acknowledged the claims that architecture had on the gratitude of mankind. He was induced to enter on a somewhat treacherous ground of discussion as to the relations of architecture with the other arts. He, if we interpret his meaning aright, drew a comparison between the relations that existed between them in Mediæval times unfavourable to the customs of the present day. Some men now seemed, he said, to have assumed that the only function of the graphic arts was to ornament architecture. The old masters, however, had never been prepared to strike or veil their colours, nor did he believe in any "gilded vassalage of the other arts to architecture." Architecture, from his point of view, consisted in a building that showed fitness for its purpose, and, in addition, was lighted up by appropriate beauty—not beauty thrown over it like an adventitious garment or meretricious gauze—but the beauty of the soul of the building looking out of it. A sharpened sense of beauty, he considered, was the true hall-mark of every artist, whether painter, architect or sculptor. That the three arts might gain indefinite enhancement by more close spiritual communion he did not doubt, though the gain to architecture depended on a more subtle and sober use of ornament.

THE judgment which was given in the Queen's Bench Division on Monday does not determine the question whether any of the London authorities can take part of a house for the purpose of widening a street without paying the value of the whole of the building. That important point will have to be fought out at a trial. All the judges could do was to say there was no reason to interfere with the action of the Kensington Vestry when they sought to have compensation assessed for the value of a portico, step and cellar flap which were required for widening a footpath. The question whether partial compensation is adequate has not been determined in respect of London, although MICHAEL ANGELO TAYLOR'S Act, which authorises the compulsory taking of "any houses, walls, buildings, lands, tenements and hereditaments, or any part thereof" for street improvements has been in force for more than a century. The owners of the property sought to restrain the vestry from summoning a jury or from taking other proceedings which would relate only to the portion of the property which was immediately needed. Mr. Justice CAVE admitted that there were no decisions on the point, but as land could be taken or a part of a garden in front of a house, it might be considered that the removal of a part of a house could be enforced so long as the house was left substantially in its former state. The removal of a portico might make it necessary to alter the rest of the house structurally, and to adapt it to new purposes, or to leave it suitable only for a different kind of business or business of a more limited nature, and in such cases it would not be within the powers of the vestry to force the owners to give up the portion. But if the business could be continued as before, and the alteration did not interfere substantially with the business, then the vestry could take it. But the effect of the removal could only be determined at the trial of the action, when all the circumstances would be considered. Mr. Justice

COLLINS took a similar view. He said a house is *primâ facie* a unit incapable of being divided, but there are cases where certain portions can be cut off without destroying the identity of the house as a house. There is nothing in such a case to prevent the compulsory powers of the vestry from being exercised, but if what is sought to be removed is so indissolubly linked to the house that it cannot be removed without destroying the identity of the house, then the whole must be dealt with. It remains, therefore, for the plaintiffs and their advisers to consider how far it can be proved that the portico, step and cellar flap will affect the value of the premises, which is a subject for expert evidence. A portico is often an important feature in an hotel or public-house. Business could be conducted after its removal; but, as the appearance of the house would be changed, it might be that the business would be of a more limited nature. The decision of the two judges has narrowed what is at issue, so that the action becomes one of compensation.

THE architectural works which have been sent from Rome by holders of the Prix de Rome, and are seen in the Ecole des Beaux-Arts, are of the usual quality. M. SORTAIS shows a restoration of the Temple of Canopus, one of the adjuncts of Adrian's Villa at Tivoli, in which religious exercises of a sensuous character were carried on. Another shows the white Parian marble arch of Trajan in Ancona, which some consider to be finest of all the triumphal arches, although it no longer possesses the ornamentation and sculpture with which it was enriched, and a third the tomb of GATAMELATA, in Padua. M. SORTAIS' contribution is the most important. M. PONTREMOLE sends a drawing of the *Lion of Florence*, and M. EUSTACHE a drawing of the tomb of the Doge VENDRAMINI, in Venice, one of the noblest examples of its class, which is supposed to be wholly or partially the work of ALESSANDRO LEOPARDI. M. BERTONE is represented by a study after the antique.

WE have been asked to mention that some of the statements about private galleries in Paris, which we printed a fortnight ago on the authority of the *Figaro*, have not the exactitude which is the characteristic of the *Architect*. MEISSONIER'S *Reading at Diderot's* belongs to Baron EDMOND DE ROTHSCHILD and not to Baron GUSTAVE, his brother. The full-sized portraits by REMBRANDT, two of the master's *chefs-d'œuvre*, which were in the celebrated Van Loon Collection in Amsterdam, came directly into the collection of the Baron GUSTAVE DE ROTHSCHILD. They represent Willem Daey (SMITH, "Catalogue raisonné," vol. vii., page 122, No. 340) and Meijfvrrouwe Daey, his wife (SMITH, vol. vii., page 176, No. 551). MEISSONIER'S "1814" belongs to M. CHAUCHARD, and was never in the Duc de MORNAY'S gallery.

THE competition for the new public baths and wash-houses for St. Marylebone has been settled. On the recommendation of Mr. CHARLES BARRY, the assessor, Mr. JOHN JOHNSON, 9 Queen Victoria Street, E.C., has obtained the first premium of 100*l.* The second prize of 60*l.* was awarded to Mr. A. SAXON SNELL, and the third of 40*l.* to Messrs. ARDRON & CHEERS. The premiated designs can be seen at the Vestry Hall, Marylebone Lane, W.

THE one hundred and fortieth annual meeting of the Society of Arts was held on Wednesday, Sir HENRY DOULTON, vice-president of the Society, in the chair. The Prince of WALES was re-elected to the Presidentship, which office he has filled since 1864. The new vice-presidents elected were H.R.H. the Duke of YORK, the Earl of ROSEBURY, Lord HALSBURY, and Sir COURTENAY BOYLE; the new members of council were Captain ABNEY, Mr. WOLFE BARRY, Lord BELHAVEN, and Mr. A. SIEMENS. The report, which was read by the secretary, Sir HENRY WOOD, summarised the work of the society for the past year, and referred specially to the Chicago Exhibition, for which the Council of the Society had acted as a Royal Commission.

REYNOLDS AND THE BOLOGNESE SCHOOL.

THE admiration which Sir JOSHUA REYNOLDS so often expressed towards the CARACCI and their followers has been a surprise to many readers of the "Discourses." It is, however, easily explained. HAYDON and many other critics imagine that the first president of the Royal Academy was not sincere when he was addressing students on the subject. They say his teaching was not confirmed by his practice. According to them REYNOLDS had only one idol—TITIAN—but he took care to keep his idolatry to himself. It is not always a teacher's duty to set up his own conduct for imitation, for he may feel that he has been unwise in adopting a creed or that the belief which seems congenial to himself is not adapted for novices. For a portraitist of genius TITIAN's works were invaluable, but the founders of the Academy had not the intention of restricting British art to that class of production. The Bolognese examples on the contrary were adapted to be set before young portrait-painters and landscapists as well as before painters of history pieces. They might be described now (although the phrase would not be understood in the last century) as "all-round" models. They were excellent in drawing, composition and colouring beyond the majority of the works of the Italian masters, in fact they were only surpassed by RAPHAEL's, which might be considered as unattainable in this country. The sonnet which AGOSTINO CARACCI composed about the aims of the Eclectic School is suggestive of insipid concoctions, but it expressed the kind of things which teachers of all kinds like to set up for imitation. To say to an embarrassed artist who is anxious to obtain the money that will pay the rent of his studio with the least delay, that he must endeavour to combine in his picture the design of Rome, the chiaroscuro of Venice, the dignity of Lombardy, the terrible animation of MICHEL ANGELO, the nature and truth of TITIAN, the purity of CORREGGIO, the symmetry of RAPHAEL, the decorum of TIBALDI, the invention of PRIMATICCIO, mixed with a little of PARMIGIANINO's grace, is a sort of cookery-book recipe for the production of indigestibilities. But all the ingredients are excellent in themselves if enjoyed singly. The CARACCI went nearer than most men in making a combination of them, and their products have their use if only as warnings. We might compare the Bolognese pictures to the headlines which are set before students in calligraphy. The moral sentences of the copper-plate engraver are too finely executed for everyday use; nobody who employs his fingers in a manly occupation could ever hope to write in that way. But the engraved lines probably have saved compositors, experts in handwriting and receivers of letters a good deal of trouble in making manuscripts less illegible.

A schoolboy who can employ graceful curves and firm lines resembling the engraver's will, when he has had practice in correspondence or office work, modify them and gain a style of his own. As we take it, REYNOLDS recommended the imitation of the CARACCI with a similar object in view. He did not wish the students of the Academy to persist in a mimicry of the Bolognese artists during their lives, but to employ the style as a sort of restraining force against an immature individuality which was likely to be marked by excesses. That view is suggested by what he says in his second discourse:—"Style in painting is the same as in writing—a power over materials, whether words or colours, by which conceptions or sentiments are conveyed. And in this LODOVICO CARACCI, I mean in his best works, appears to me to approach the nearest to perfection. His unaffected breadth of light and shadow, the simplicity of colouring, which, holding its proper rank, does not draw aside the least part of the attention from the subject, and the solemn effect of that twilight which seems diffused over his pictures, appear to me to correspond with grave and dignified subjects better than the more artificial brilliancy of sunshine which enlightens the pictures of TITIAN; though TINTORET thought that TITIAN's colouring was the model of perfection and would correspond even with the sublime of MICHEL ANGELO, and that if ANGELO had coloured like TITIAN, or TITIAN had designed like ANGELO, the world would have had a perfect painter." In these words the President appears to speak as a teacher rather than as an artist who was revealing the qualities he sought after in his own works.

REYNOLDS must also have known that if the CARACCI expected to form a body of imitators when they set up their school they were doomed to suffer disappointment. The Bolognese school is inferior to all the other Italian schools in some desirable qualities, but it surpasses them in the variety which was exhibited by disciples that were supposed to be examples of fidelity to the founders of the school. The composite nature of the system would at any time lead to that result. If instead of "un po' di grazia del PARMIGIANINO" a larger modicum of grace were introduced the difference would be apparent, and the relative quantity of any of the other elements would make one picture orthodox according to Bolognese canons and another have an opposite character. The most faithful imitation in painting is not always taken to be virtuous. DOMENICHINO's *Communion of St. Jerome* in the Vatican corresponds with the *Confession of St. Jerome* by AGOSTINO CARACCI. But instead of accepting the picture as a proof of the loyalty of a pupil towards a master to whom he was indebted, the world has looked down on it despite its great merits as a revelation of the weakness of the painter, who made himself a tool of ANNIBALE CARACCI at a time when that artist was jealous of his brother on account of the success of the *Confession*. It would therefore be absurd to suppose that REYNOLDS could have desired to see the English Academy become a sort of foreign branch of the Bolognese school.

There was likely to have been another reason for REYNOLDS's admiration. The effort which the CARACCI made in Bologna was not altogether unlike the experiment in which the Royal Academicians were engaged 170 years afterwards in London. In England the system of pupilage was declining when the Academy was founded in the eighteenth century. It was supposed a substitute would be found in the new schools. The old system of pupilage or apprenticeship which had lasted so long in Italy was overturned by LODOVICO CARACCI. He was a slow, patient, ruminating artist, and his rivals nicknamed him "the Ox." There was in him none of the swagger, presumption, or self-sufficiency of the earlier artists. TINTORET could not discern any talent in him, and advised him to abandon painting. LODOVICO believed, however, that perseverance could compensate for many defects, and when he found he was not made competent in Venice, he tried his luck in Florence and Parma. He was no believer in the supremacy of any artist of that time, which denotes his shrewdness, for the decline was then prevailing, and, as became a contemporary of FRANCIS BACON, he tried to raise the superstructure of art on the foundation of science by a rigorous comparison of the qualities of pictures by a variety of masters and an investigation of their principles. There were no idols of the school for LODOVICO. Returning to Bologna he persuaded his cousins, AGOSTINO and ANNIBALE, to follow painting, and as soon as they were grounded in the elements of art he sent them to Parma to study the dome paintings of CORREGGIO, and to Venice. AGOSTINO was versatile, and is more likely to be remembered by his sonnet and engravings than by his pictures. ANNIBALE was endowed with finer abilities by nature than either his brother or cousin, and his paintings are the best exemplification of any virtue which eclecticism may possess.

The people of Bologna were not willing for a time to admit that the CARACCI were as competent to paint as their contemporaries. It was not an age when self-instruction was considered feasible, and apparently it would have been hard to discover an artist who was willing to testify to the ability of the reformers. It was not until LODOVICO had demonstrated in a room of the Fava Palace how well he could compete with any of the artists of the city that he was recognised as a painter. Then the relatives opened their academy, in which AGOSTINO became the principal teacher. They obtained drawings, engravings and casts from the antique for the instruction of the students, the living model was introduced, and lectures were given on composition, criticism, architecture, &c. There were also periodical fêtes. But with all its advantages and attractions, it is doubtful whether the *Incamminati*, or Academy of Progress, met with immediate success. DENIS CALVART, CESI and FONTANA were then the representatives of the old system in Bologna, and their pupils had to sacrifice prejudices and go over to the new school before it could be considered as established. It is said that the principal objection which

CALVART raised against the new system was on account of the importance attached to the study of nature. There could be no stronger proof that the CARACCI did not begin their innovations too soon. That their system of teaching was effective is seen in the success of pupils, for among them were DOMENICHINO, ALBANO, the two MOLAS, GUIDO, GUERCINO, LANFRANCO and TIARINI. Those artists differed in their manner of painting, but they all agreed in avoiding the contorted figures which were supposed to be a testimony of homage to MICHEL ANGELO.

REYNOLDS could not approve of the disregard of the great Florentine, but other practices of the school would recommend themselves to him and to other lovers of a safe course. The Bolognese school represented compromise as well as eclecticism, and was therefore adapted to the circumstances which surrounded the infant academy in London. As much success as was gained by the students who listened to the CARACCI would have appeared satisfactory to King GEORGE and his advisers.

It would perhaps have been preferable if the President could have informed the students that, whatever was the case with the Greeks, the greatest painters of the Renaissance and the later period were not remarkable for that balance of qualities which the CARACCI were supposed to attain. The great painters from whose works certain attributes were supposed to be derivable carried those attributes to excess. The verity of TITIAN, the harmony of RAPHAEL, the ornamentation of TIBALDI were not stingily measured, they were given out liberally, and on that account have been prized. It is strange that the CARACCI, when preparing their recipe and advising a selection of various qualities, did not perceive that, however logical might be the result, it would not be captivating. In the mineral kingdom it is possible to find gems that are entirely perfect, mathematically exact in planes and angles, but in the organic world nature is indifferent to uniformity of that sort, and according to our human standard a natural scene or object never becomes sublime until it displays exaggeration on an unusual scale. It may be admitted that the imitation of the works of great artists is attended with more danger than the imitation of eclectic examples, because any excess in the former is certain to be magnified in the copy. Eclectic examples, on the other hand, are so subdued throughout, having so little about them that is mannered, that they seem to be adapted to become a sort of basis on which individuality can assert itself. Mechanical science is founded on geometry—that is, on notions of points that have no parts, lines without breadth and surfaces without thickness. But it is none the less practical on that account. REYNOLDS and his friends may have concluded that a corresponding result could be gained in painting by starting from the works of the Bolognese school, which come nearer to abstractions than the majority of paintings of any age or country. They had also the advantage of being a sort of “elegant extracts,” for in many of the pictures by the CARACCI there is no difficulty in perceiving that the admiration for other masters was expressed by employing some of their figures. By a study of those pictures a student is therefore made acquainted with parts of infinitely greater works. These reasons seem to us to justify all that REYNOLDS has said on the subject.

THE MECHANICS OF ARCHITECTURE.*

BUILDING Acts and by-laws have made it less imperative for an architect to be guided by mechanical principles. The prescribed dimensions have at least the advantage of guaranteeing stability. But authority, after all, has only given sanction to rules which experience had established. Whatever may be the shortcomings of English buildings of the cheapest class, they are at least likely to endure, and that fact should gain respect for those who first established the allowances for safety. It is rare to hear of the collapse of a jerry-built house in a storm. Examples of the same sort of construction are often utilised for purposes which were not contemplated when they were erected, and

which impose greater strains on the materials. Yet somehow they manage to survive. A Cambridge Wrangler, if he applied his scientific knowledge in overhauling the plans, could not achieve a more satisfactory result. It would be more likely that his conclusions (assuming them to be substituted for the old-fashioned rules) would not be conducive to permanence or safety. The Tay Bridge catastrophe will always be a reminder to those who imagine that acquaintance with theoretical mechanics can make a man infallible when he designs a structure. It should also be remembered that the materials which are readily obtainable in the market must also affect the calculations that are based on scientific principles. In German books of construction there are abstruse investigations of such subjects as the diameter to be given to the piping for gas in ordinary rooms or for the water-supply of a small house. But it is not to be expected that lead or iron pipes will be found that will correspond exactly with the bore which was ascertained by calculation to be the fittest. There are also theorists who conclude—perhaps we ought rather to say who imagine—that the web in rolled girders is far too thick. Whether that assumption is right or wrong, we need not consider; it is sufficient to say that in rolled beams, as in cast-iron beams, the necessities imposed on the manufacturers must be respected.

All that can be accomplished by either mechanical or chemical science in building is so limited that it rarely warrants a departure from established ways. In fact, it will generally be found that, when failures arise, their origin is to be traced to conclusions which were derived from theory, and which were not confirmed by experiment or experience.

Although it can have only a modest sort of relation to building practice, theory should not be neglected. In the first place, it imparts the satisfaction which is always felt when we can perceive principles in common objects. Then it has the advantage of inspiring scepticism of rules which, however satisfactory in general, may be inadequate to serve a particular case. Without theory, construction cannot be well explained, and it is difficult to understand how the Byzantine and Mediæval builders, who must have had only a rudimentary theory of mechanics, were able to persuade the clergy to allow them to undertake daring feats of construction. As faith prevailed, we suppose the master of works was allowed to do what he pleased. According to Mr. TARN, the thrust of the semi-dome in St. Sophia amounts to 125 tons, and the thrust of the dome is 450 tons. By what means did ANTHEMIUS, ISIDORUS or IGNATIUS convince the emperor that the walls and semi-domes were equal to meet so much power? In our time the problem could be easily explained.

In his exposition of the theory of mechanics as applied to St. Sophia, Mr. TARN is careful to say he is only aiming at an approximation of the actual thrusts. The word suggests one important quality in his book. Mr. TARN does not write merely as a mathematician; he is careful to suggest the limitation of the science in whatever relates to practice. That sort of care is more necessary in dealing with mechanics as applied to architecture than in engineering cases. The engineer relies mainly on iron and steel, which may be considered as being uniform in their qualities. A conclusion arrived at in one case will therefore be generally applicable. But when natural materials are employed without undergoing a process of transformation there is unfortunately less certainty, and ultimate strength must be considered as having a more or less remote relation to what can be borne in safety.

Mr. TARN, besides those on the general principles of mechanics, has chapters treating of beams, including flooring, pillars, roofs, trusses, arches, domes, spires, buttresses, shoring, retaining walls, foundations, piling, effect of wind on buildings. Appended are several problems which comprise typical cases with solutions. Like the other books by the author, “The Mechanics of Architecture,” if carefully studied, will have a disciplinary value, and will impart new interest to construction. It serves a purpose for which standard works like RANKINE’S, STONEY’S and WEISBACH’S were not sufficiently special.

* *The Mechanics of Architecture: A Treatise on Applied Mechanics, especially adapted to the Use of Architects.* By E. Wyndham Tarn, M.A. Second Edition. Crosby, Lockwood & Son.

Mr. William Dunn, M.P. for Paisley, presented the town with a public garden. The grounds are situated in the centre of Paisley, and have cost the donor some 9,000*l*.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE concluding meeting of the session of the Institute of Architects took place on Monday evening, Mr. F. C. Penrose, president, in the chair.

The decease of Mr. W. Calder Marshall, R.A., was announced.

A resolution submitted by the President and supported by Mr. Charles Barry was passed spontaneously, viz.: "That the Royal Institute of British Architects desires to be associated with the Central Society of French Architects in an expression of the horror and indignation with which the news of President Carnot's mournful death has been received, and to offer on behalf of British architects at home and beyond the seas respectful and sympathetic condolence with their colleagues in France in the horrible calamity of last night."

The President's Address.

The President in the course of his address said:—We have now before us a much more grateful task, and one in which I feel it to be a high privilege to take a share, in presenting, in the name of our gracious patron, Her Majesty the Queen, the gold medal to one who has greatly honoured us by accepting it at our recommendation. The distinguished president of the Royal Academy is well known to all of us here by his works and by his renown, and to many by his friendship, and his genial courtesy to all who have had any intercourse with him.

Sir Frederic Leighton was born at Scarborough, and his natural inclination towards the graphic arts early declared itself. His father, a physician, though he had other views for his son—intending it is said to give him a University education, with a view to his ultimately being called to the Bar—nevertheless encouraged him to make himself acquainted with anatomy, and gave him every facility for the study of art in order that he might be equipped for the profession should he eventually follow it. We early find him, then, studying at Rome; and, if I may be allowed a moment's digression, this leads me to reflect that I must occasionally have fallen in with him during the winter and spring months at the Artist's excursion called the Cervara, or on the Pincio, or when it was the ambition of the British art students who were there to fall in with John Gibson at his early coffee at the Lepre. Dr. Leighton became so far a convert to his son's wishes as to consent that the latter's drawings should be submitted to the celebrated American, Hiram Power—a man not less remarkable for his great skill as a sculptor and his knowledge of art than for his noble physique, his courteous manners and his sterling character—and if he decided that there was the true artist's ring about these works, his son should no longer be opposed in following the bent of his inclination. We may, I think, appreciate the pleasure which the good American had in assuring the father that there could be no doubt whatever on the subject. The pithy way in which old Hiram Power gave his verdict is worth recording: "Then you think," said Dr. Leighton, "I ought to let my son be an artist?" to which there came the answer—"You have no choice, sir; Nature has done that already." After this the youthful painter studied in various European centres, and made himself proficient, not only in the art of the countries in which he sojourned, but also in the languages, as those who have heard him discoursing with foreigners can testify. At Brussels, when eighteen years of age, he produced his first finished picture, *Cimabue Finding Giotto in the Fields*. He shortly afterwards showed his sympathy with our profession by a painting of which the subject was the death of Brunellesco. After some residence in Paris, working at the Louvre, he studied at Frankfort under the painter Steinle, to whom he submitted the design of his magnificent picture *The Triumph of Cimabue*, which he carried out at Rome. I have heard that during this period Thackeray fell in with him and prophesied that, although as yet altogether unknown in England, he would become president of the Royal Academy. The picture above referred to was sent to England for the Exhibition of 1855, then held in the rooms of the National Gallery. The picture was immediately bought by the Queen. But, for the present renouncing what might have seemed a lucrative opportunity for accepting work in London, he returned to his studies, and resided for some years on the Continent, chiefly in Paris, in communication with some of the most distinguished painters of that capital. Soon after his return to England, he painted the fine fresco representing *The Five Foolish Virgins*, in the church at Lyndhurst, in the New Forest; and in the same material, but more recently, two large fresco paintings at the South Kensington Museum, representing the Industrial Arts applied to Peace and War. It is, however, impossible in the space here available, to enumerate anything like a list even of his principal paintings. *The Power of Music* was exhibited in 1856. The classical subject of *Hercules Wrestling with Death for the Body of Alceste* must be specially mentioned, for it called forth the praise of his

friend Browning in the poem called "Balaustion's Adventure":—

I know, too, a great Kaunian painter, strong
As Herakles, though rosy with a robe
Of grace that softens down the sinewy strength,
And he has made a picture of it all.

More lately we have seen the fine, pathetic picture of Andromache, *dejectam conjuge tanto*, in her captivity. In 1881 the merited compliment was paid him in the request from Italy that he should contribute his portrait to the gallery of distinguished painters in the Uffizi at Florence. Not content with the triumphs of his brush, he has invaded the sculptor's domain. In 1877 we admired the fine group of the *Athlete Struggling with a Python*, and in 1886 his bronze statue of *The Sluggard*. I shall presently have to speak of his potential claim to graduate in architecture. Up to 1883 he had for many years, as their colonel, led the Artists' Corps of Volunteers. His eloquence in presiding at the Royal Academy dinners is the theme of all. The social side of his character is equally admirable, and many are those who can bear witness to generous actions on his part, both in purse and kind sympathy. I do not suppose there is any one in this room who questions that the Institute has been thoroughly right in making the award of this medal which we have the happiness of bringing to its consummation to-night; but, in case there should somewhere be a doubter, I will make a few remarks on that head. Had Sir Frederic Leighton no other claims upon us than the noble architectonic works that have often been products of his hand, works, many of them in oil and fresco, executed for the embellishment of public and private buildings, the Institute would have a perfectly good answer to give. The late Prince Consort thus defined the ruling principle—namely, that the appropriation of the Gold Medal should be left an open question to be raised according to circumstances in each year, and to be applied as the Council might periodically feel to be the best for the general interests of the profession. The Institute would therefore be justified in awarding the medal to an artist of high distinction either as a painter or sculptor. But Sir Frederic Leighton is very much more than a painter. He is the only President of the Royal Academy, from the time of its first foundation, of whom it can with certainty be said that he has evinced a thorough knowledge of all the great arts, and who is practically great as a painter, a sculptor, an orator and a writer.

The greatest master in art since the days of Pericles is reported to have said, "I know but of one art." There have been but few who could justly adopt those words, but one of those few is Sir Frederic Leighton. Similar to its tripartite analogy in nature, where length, breadth and thickness form one space, so architecture, sculpture and painting are one in art; the practice is different, but the principles, whenever excellence is touched, are found to be the same in each branch. You know Sir Frederic Leighton's high achievement in sculpture. In architecture there is the clearest evidence of what I have called his potential merit had he had occasion to practise in our special branch.

In biennial addresses to the students of the Royal Academy, particularly in the years 1889, 1891 and 1893, we find criticism of the highest value clothed in beautiful language on the Spanish, French and German schools of Mediæval architecture. Not mere sketches and generalisations, but dealing with the subject in an exhaustive manner. Our ex-President has most happily and justly eulogised these addresses in his discourse to students at the beginning of this year.

That an artist of such refinement would also be in sympathy with the spirit of Classical architecture will not be doubted. I had myself frequent opportunities of bearing witness to his appreciation of the elements of beauty in the works of the Greeks at meetings of the Publication Committee of the Society of Dilettanti; but I wish particularly to call your attention to the masterly summaries of the characteristics of Mediæval architecture as practised by the leading races of Continental Europe in the Academy lectures before referred to. The whole series is full of practical teaching in clear and incisive language, but as in this address limitation is necessary, I will confine myself almost entirely to what is said on the evolution of Gothic architecture from its source at St. Denis. After a short discussion of the earlier manner of vaulting from the Roman type, in which stability for the waggon vault was sought in the resistance of solid masses of brick and concrete work, we read:—

"The substitution of the principle of a balance of active forces to this principle of inert resistance is probably the greatest revolution ever introduced in the science of building; we have here the generative principle of Gothic architecture, its essence and its life. How this revolution was brought about I can of course only indicate to you in summary outline. Let us first note in passing that the presence of a pointed arch, except as a structural form, does not constitute Gothic architecture. Isolated radiating pointed arches have been built in ages and countries in which the Gothic style was not dreamt of; a building might be Gothic in structure and principle without showing a pointed opening anywhere; it is through the

roof, not through the window, that the formative Gothic idea entered."

Then, after describing various expedients for securing stability, including the important step taken at Vezelay, where intersecting vaults, but without ribs, were substituted for the continuous waggon-head—an advance, but not yet satisfactory—we read:—"A few years later, in the early middle of the twelfth century, a Benedictine monk, feeble of frame, but of a lofty spirit, Suger, the great Abbot of St. Denis—who has on sculptors, by the by, this special claim, that he boldly withstood the bitter denunciations launched by St. Bernard against the sculptural decoration of churches—began the erection of a church in which the tentative gropings, at which I have just hinted; gave place to the systematic and logical application of a new and fruitful conception—the idea of stability based on the balance of active forces, expressed in a self-sustaining combination of upright supports and vaulting ribs, with detached buttresses bringing their action to bear exactly on the points at which the thrust of the vaults is gathered up."

The address concludes:—"Is there any lesson that we may draw from this hurried survey of artistic evolution among the French? I have dwelt with emphasis on the genius of their Mediæval builders; do I advocate—the young architects for whom I have mainly spoken to-night may ask—do I advocate the adoption of Gothic forms for the purposes of our own lives? I have spoken to little effect if my answer can be doubtful. Artistic forms are the vesture of ideas and the expression of mental conditions; the ideas and mental conditions of our day are widely removed from those of the Middle Ages; the modern mind cannot with fitness put on the garb which was moulded on the mind of a day long past. But if we may not fitly adopt those forms, we cannot too reverently note the spirit which presided over their development, for a like spirit brought to bear on other material and under other conditions may yet bear new and noble fruit. And the characteristics of that spirit are a masculine independence, a tenacious grasp of central principles, a fearless sincerity in expression, a scorn of shams and trust in truth."

In Sir Frederic's address for last year we find admirable criticisms on the German Mediæval architecture; praise where due is given to the German Romanesque, and afterwards the reflection, which appears to me perfectly just, that the Germans as a race were never in unison with Ogival architecture; and in respect to their great achievement—Cologne Cathedral—though not withholding praise, he observes, as I think most truly:—"We feel that we are in the presence and under the spell of a powerful will, grasping serenely and solving with unflinching and intellectual resource a scientific problem; we bow accordingly before a triumph of skill and volition; we are not, as it seems to me, thrilled by the kindling touch of genius."

To the pictorial works by Sir Frederic Leighton in connection with architecture already named may be added paintings for the ceilings of a house at New York, of which our gold medallist, Mr. R. M. Hunt, was architect, as well as several of the same character in London. But I must specially mention one work combining architecture in the solid, with which he has had much to do. I allude to the removal of Alfred Stevens's monument from the south chapel in St. Paul's to the nave for which it was originally designed, which was done entirely under his inspiration and in no small degree at his expense. I feel sure that there can be no need for me to dilate further on what seems to require no argument in justification of the action of our ex-President and of the Council, and of the Institute which has ratified their action in awarding this medal, especially when, to the great advantage of the Institute, Sir Frederic Leighton's acceptance of it sheds lustre on the roll of medallists, so well begun with the loved and honoured name of Professor Cockerell, and it must be obvious to all of us that the whole profession gains from the fact that the chief representative of art in its three branches in this country thereby shows how much he is in sympathy with architecture.

The PRESIDENT then presented Sir Frederic Leighton with the Royal Gold Medal.

Sir F. LEIGHTON, in returning thanks, said he wished to express how deep and warm was his sense of the honour he had received—one quite unique, as he understood it was the first time that honour had been conferred on a painter, an honour to which the President had added so much grace by his words. In regard to an ancient and noble craft it might be said that enthusiasm and sympathy were contagious. In some small degree he hoped that he had rendered some service, by word if not by deed, to the spreading of the atmosphere of favouring interest in which every creative effort best thrived and prospered. Alluding to the three arts, he said no one would deny that the co-operation of the arts had bestowed on the world many of its choicest masterpieces, such as the House of the Virgin Goddess at Athens, Chartres Cathedral, and St. Mark's of Venice. Neither was it open to challenge that great advantage must accrue to the followers of architecture, painting, and sculpture from a knowledge of and sympathetic insight into the nature of each art,

and the fundamental affinities which united them. On the other hand, the fruitfulness of solidarity between them had led to no little misapprehension as to the true character of their relationship. The subordination of painting and sculpture to architecture was a short-sighted fallacy, revealing but a scant appreciation of that house of many mansions—the house of art. Even in the face of architecture, the arts of which the theme was man, and the myriad-mooded aspects of the outer world, stood unabashed, even among the children of the greatest architects the world had ever known. In early Mediæval days, when the building was the book, the open volume on which alone could be read by an unlettered people the truths of faith, and that little which was then the sum of knowledge; in the days before the printing-press had shorn architecture of half its phonetic function, some such contention on its behalf was no doubt tenable. But in more modern times great changes had come over art, and notably over painting, which, without abbreviating its severe and more restrained function in connection with architecture, or its most ornamental developments, had explored and occupied whole regions of new, emotional and imaginative suggestions—the realms of mysterious and alluring glooms, wherein Rembrandt was king, and all the witching range of the fugitive and fitful lights which flitted and flamed, and fainted across the fair face of the sea and of the land in which Turner conjured without a peer.

In these its phases the painter's art was self-centred and unobeholden. He had more than once been asked to express his views on architecture from the painter's point of view. His answer had always been, in substance, that architecture was an art of which the conditions were unique as well as imperative, and knew no determining artistic motives outside itself. These conditions were the rigorous fulfilment in each case of the demands of a dictated problem of utility, of which the result was a structure stamped with the expression of its functions, lit up and ennobled throughout by the spirit of beauty. Whilst in fruitful intercourse Architecture might gain a heightened charm and a warmer and more supple life, how great was the service that she might in her turn, if rightly consulted, confer on the other arts, for where better than in her best and purest works could the painter and the sculptor learn the great and needed lessons of wise restraint, of noble reticence, of thought controlled, and of ornament made doubly precious by sober use—of a truth these three arts might draw ever-increasing strength and power from closer communion of spirit among their several votaries, and it was a symbol of that growing communion that even those who might least deem him worthy of it, might yet welcome the honour for which he expressed his warm, respectful, and most unfeigned thanks.

The meeting then adjourned till November 5.

EXCAVATIONS AT ARGOS.

THE following account of the exploration of the site of the sanctuary of Hera in Argolis by the members of the American School at Athens, working under the direction of Dr. Waldstein, has been given by Mr. E. Robinson, of the Boston Museum:—

The site of the Heraion is literally one of the most commanding that could be thought of for a temple. No one who has crossed the plain of Argos can ever forget the beauty of that country. More level than Attica, its appearance is also more restful. There is hardly a mound to break its surface until one reaches the foothills of the mountains which surround it, except where the sea makes its crescent on the south. Almost hidden in the north-west corner stands the citadel of Mykenæ, commanding the whole district without being itself conspicuous. To the east of this runs a wall of low mountains, which forms the northern boundary of the plain. One of these, Eubœa, stands out a little more prominently than the others. The long, sweeping curve of its slope is broken near the base by a small crest or ridge, into which it rises just before it joins the plain, and this crest was chosen as the site for the temple of Hera.

The original temple was placed, not upon the summit of this crest, but upon the upper part of the southern slope, where a platform or terrace was constructed for it, and here it must have formed a conspicuous object from every quarter of the plain. The huge rectangular blocks, of which the retaining wall of this platform was built, were for years the only landmark of the site, until in 1852 Rangabé excavated sufficiently to locate the position of the late temple, of which I shall speak presently. The platform itself was buried to a considerable depth under accumulated soil, until the present excavations laid it bare and determined its limits. It is paved with polygonal blocks, and measures about 148 feet in length by 115 feet in breadth. Its situation, in reference to the other buildings of the sanctuary, is shown on the plan which accompanies the twelfth annual report of the school issued this spring. Unfortunately very slight remains of the temple were found, a cir-

cumstance easily accounted for by the probability that, above the base line, it was constructed of clay and wood, like the Temple of Hera at Olympia. Even the columns have disappeared, and the only unquestionable remnant on the site is a portion of one low wall, on the top of which the circles traced in the stone to indicate the size and position of several of the columns are still clearly visible. This bit of wall is much more primitive than those of the Olympian Heraion, and bespeaks a decidedly earlier date for this temple, which may therefore be the oldest Greek temple that we know. Possibly there may be other data concerning it among the *debris* of the excavations in other parts of the hill, but this is a matter for an expert architect to determine. The pavement of the platform is in remarkably good preservation. Above it, and separated by a thin layer of earth, was a concrete flooring, several patches of which are left. Some of these are blackened by fire, presumably the conflagration of which Thucydides speaks, by which the temple was destroyed in 423 B.C.

Of the later and more famous temple the remains are much more satisfactory. The Greek prejudice against erecting a new temple upon the site of an old one is well illustrated here. Instead of utilising the old platform, which was perfectly able to hold it, a second terrace was constructed below it, also on the southern slope and overlooking the plain. I say a second terrace, yet it would be more correct to speak of this as the third, there being a smaller one between the two, upon which many remains of early houses have been found. These are described by Dr. Waldstein in the report to which I have alluded. As he suggests, they probably had some connection with the service of the older temple, and were possibly the dwellings of the priestesses. The excavation of the later terrace is a remarkably clean piece of work, and reflects great credit on those who had to do with it. Every answer which the place still had to give as to the character and details of the new temple and its immediate surroundings the student finds here readily at hand. On this terrace there is nothing more to be uncovered, and evidently no fragment that could have been of the slightest importance has been thrown away. If it is lost, the manner in which the site has been unearthed is sufficient evidence that it was lost before the excavations were begun. What actually remains *in situ* is the walls of the foundations, several courses high, including those of the peripteros and the interior, and that of the steps or incline by which the temple was entered. These foundation walls are not preserved up to the level of the floor, and from the manner in which they were left it is evident that they, and probably other portions of the temple, were not destroyed by nature or by violence, but carried away block by block. There is reason to believe, therefore, that the careful examination by an architect of the towns in the plain might result in the discovery of important pieces built into Mediæval or later structures. On and near the terrace are sufficient fragments to give the general indications of the proportions and style of the temple, though here again it is surprising that there are not more. I believe that only three fragments of capitals have been unearthed, and scarcely any of the columns themselves. On the other hand, a number of blocks of the upper members have been found, and these show that both the triglyphs and the background of the pediments were of black marble.

The retaining wall which separated the terrace of the later temple from that above it formed the back of a long stoa or portico, in front of which votive statues and stelæ were erected. The bases and grooves showing where these stood are numerous, but, beyond a few inscriptions, nothing of the works themselves remains.

Below the new temple is a fourth terrace, which seems to have been occupied for the greater part, if not the whole, of its length by another portico, only a portion of which has yet been uncovered. The greater part of the working force has been concentrated upon this site during the present season, partly because it seems to have been one of the principal buildings of the sanctuary, and might be expected to contain inscriptions or other monuments of importance, and partly because Dr. Waldstein hoped that in the enormous mass of earth under which its remains are buried he might find sculptures or other valuable objects thrown over from the terrace of the temple. Some fragments of metopes have already been found here, and quantities of terra-cotta fragments. But not more than half of the portico had been uncovered when the work had to be brought to a close, and we cannot say what may yet be waiting to be brought to light.

Of the sculptures the now famous Hera head still remains the most beautiful and the most interesting. Of this and the other fragments which are now familiar in America through casts and photographs I need not speak. This year, besides the fragments found on the lowest terrace, several have been brought to light elsewhere, among them the head of a youth which bears a close resemblance to the female head found by Rangabé on this site. This year, as before, the fragments of decorated pottery discovered are almost countless. Combined they form one of the most remarkable finds of this nature ever

made in Greece. By far the larger part of the early styles, Mykenæan, Dipylon, and, most of all, the so-called "proto-Corinthian," upon the history of which they bid fair to throw new light. The labour of classifying these will be long and trying, but it will give our school one of the best opportunities that could have been desired for publishing new and valuable material.

Speaking of pottery, I cannot pass over a most interesting discovery which took place while I was at the excavation—that of a "beehive" tomb of the Mykenæ type, which apparently had never been open since the last body was placed in it. The excitement of watching an event like this cannot be described, and it is felt by the workmen no less than by those who are superintending them. First of all, the discovery that there is a tomb, a discovery possible only to the expert digger (in this case a workman), whose practised eye detects in the slight depression of the soil the fact which another would pass over without suspecting. Then the beginning of work with the pick and spade. Slowly the truth comes to light, the tomb was roughly hewn in the soft rock, and the top having fallen in, the vault or chamber is filled to the surface with a solid mass of earth. Gradually its concave walls show themselves, and then the two or three men who can work inside the hole proceed, as carefully as their impatience will allow, to clear the interior down to the level where they may expect to find something. After a time—and a long time it seemed—the first indication comes. The fragment of a human bone is struck. Now the pick and spade stop, the men get down on their knees and scratch the earth with their knives, working as delicately as Italians. Presently one of them utters an exclamation—the first vase has been found. It is a decorated specimen intact, and shows that there is hope for more. In this way the work continued for two days, at the end of which the tomb and its *dromos*, or entrance passage, had been cleared out. The tomb measured about 10 feet in diameter and the same in height. It contained no less than fifty-two specimens of prehistoric pottery, most of them fine examples of the Mykenæ and Ialysos types, with the decorations upon them quite fresh and brilliant. Of these forty-eight were vases, three were idols and one was a little chair or throne for an idol, about 6 inches tall and gaily painted. There was no metal of any kind.

TESSERÆ.

Salisbury Spire.

THE spire of Salisbury Cathedral is believed to have been added when Robert de Wyvile was bishop, a prelate of whom this ugly character has been transmitted to posterity, that it was hard to say whether he was more dunce or dwarf, more unlearned or unhandsome. While he held the see, a mandate was obtained from Edward III. for taking down the walls of the former cathedral at Old Sarum, and of the houses there which had belonged to the bishop and the chapter, that their materials might be applied, as the king's gift, to the improvement of the church at Salisbury. Not only the spire, but the two upper storeys of the tower were added when these improvements were made. This was so bold an undertaking in the architect that nothing but success could justify it. Michel Angelo's conception of hanging in the air the dome of St. Peter's did not imply a stronger confidence in his own skill than was manifested in this ambitious design of raising one of the loftiest spires in the world upon a building where the foundations had already received the load which they were calculated to support. The old wall of the tower, though strong enough when it was the summit of the pile, was slight in relation to the weight which it was now to bear. Half its thickness was occupied by an open gallery, and moreover it was perforated by eight doors, eight windows, and a staircase at each of its four angles. For the purpose of strengthening it the windows were filled up; 112 additional supports were introduced into this part of the tower, exclusive of iron braces; and 387 superficial feet of new foundation were formed. It is presumed also that at this time the arches and counterarches were raised across the small transept. The difficulties were so evident and so great that it has been said they were enough to have frightened any man in his senses from pursuing so rash and dangerous an undertaking. It has, however, withstood the storms and the sap of more than five centuries, and we are told that, if carefully inspected, it may remain twice five centuries to come. Two stories of the tower were evidently raised at the time when the spire was added. From the centre of the tower the spire rises; four of its sides (for it is octangular) resting on the walls of the tower and four on arches raised at the angles. The wall of the tower is there 5 feet thick, two of which are occupied by the base of the spire, two by a passage round, and one by the parapet. The wall of the spire gradually diminishes till, at the height of about 20 feet, it is reduced to 9 inches, of which thickness it continues to the summit. A settlement took place in this beautiful structure, it

is believed, soon after its completion, at the western side, or rather in the piers or clustered columns, under the north-western and south-western angles of the tower. Such methods as were deemed best have been employed at different times to counteract the danger. At the top of the parapet of the tower, the tower declines 9 inches to the south and more than 3 to the west; but at the capstan of the spire the declination is 24½ inches to the south and 16½ to the west. In such an elevation this is not perceptible to the most practised eye, the height being 404 feet, according to the most approved measurement. That of Strasburg is 456; that of Vienna, which exceeds all others, 465; but Salisbury is the loftiest stone building that has ever been raised in this island. The spire of old St. Paul's, which was 520 feet in height, was constructed mostly, if not entirely, of timber and lead.

Ceiling Painting in England.

Rubens received for his painting of the grand plafond at the banqueting-house, Whitehall, the sum of 4,000*l.*, which is little more than 400 yards of work, so that he was paid nearly 10*l.* per yard. This patronage was bestowed in the days of that great encourager of the arts, the unfortunate King Charles. Now our countryman, Sir James Thornhill, received for his laborious and crowded designs on the ceiling at Greenwich Hospital only 3*l.* per yard, and this nearly a century after the painting of Whitehall, when the comparative value of money was so much reduced, and only the sum of 1*l.* per yard for painting the ornaments upon the walls. This employment he was appointed to in the reign of Queen Anne, but the work was not completed until the reign of King George I. He commenced in the year 1708 and finished in 1727, for which he was paid altogether the sum of 6,685*l.* The valuation of the work, after many attempts to screw the painter to a cheaper contract, was made by the directors of the hospital after consulting the following eminent artists, natives and aliens, then practising the art with various success in London—Vandervelt, Cooper, Richardson, Sykes and Degard, who reported in favour of Sir James, that the performance was equal to any of the like in England, and superior in number of figures and ornaments. "The late Duke of Montagu," says Sir James in his memorial to the commissioners for building the hospital, "paid Monsieur Rosso for his salon 2,000*l.*, and kept an extraordinary table for him, his friends and servants for two years, whilst the work was doing, at an expense computed at 500*l.* per annum, which is near 450 yards, amounting to about 7*l.* per yard. Signor Verrio was paid for the whole palaces of Windsor and Hampton Court—ceilings, sides, stairs and back-stairs—8*s.* per foot, which is 3*l.* 12*s.* per yard, exclusive of gilding, had wine daily allowed him, lodgings in the palaces, and when his eyesight failed him a pension of 200*l.* per annum and allowance of wine for life." Rizzi had of the Duke of Portland for three rooms 1,000*l.*; for the little chapel at Bulstrode, 600*l.*; of the Lord Burlington for his staircase, 700*l.* Pellegrini, of the Duke of Portland, for work at his house, 800*l.*, and for a small picture over a chimney, 50*l.*; of the Earl of Burlington, for the sides of his hall, 200*l.*

Rational Criticism.

The uneducated man judges by his feelings; the half educated by rule. He who is thoroughly master of the subject returns again to his feelings, but to feelings trained and purified by study and reflection; and this training of the mind to a true taste for what is good and beautiful is an employment exceedingly pleasant in itself, and conducing to that perfection of the intellect which it is the object of every man to attain. A person who thus criticises every fine building which he sees, without vanity or presumption, with a sincere desire to find out whatever is excellent, and to understand, and fully enter into, the reasons for any admiration which has been generally bestowed upon it by others, yet at the same time not blindly following authority, but bringing everything to the test of his own feelings and judgment, will form to himself a habit, profitable not only when applied to architecture and the other fine arts, but in every subject on which the human understanding is exercised.

Economy of Means in Greek Art.

Who shall say that Greek architecture is poor because its mouldings are few? Seven musical notes have sufficed for thousands of exquisite melodies, and each nation has its own peculiar airs. Who shall count the endless varieties produced by twenty-four letters since language first assumed its written form. "It was not by a multitude of different and isolated impressions," says Dupaty, "that the Greeks sought to interest, to move the feelings and to satisfy the sensibility. They had only one leading idea, and that was a grand one. They repeated it continually, and they modified it much by all the fugitive adaptations of sensible and insensible gradations of which it was susceptible. The Greeks by this means satisfied two singular caprices of sensibility, which, idle and at the same time craving for something new, seeks to retain the same

sentiment and excite a new sensation." To the like effect is the opinion of Milizia, that "the ancients accomplished grand works, as in their temples, by attending to the one great purpose of producing a grand impression at the first glance of a building. They knew not affectation or pedantry. But the moderns are over-scrupulous in minutiae, lose themselves in littlenesses, and consequently too often only accomplish little things without beauty."

Wren and the Balustrade of St. Paul's.

The following reply by Sir Christopher Wren is in answer to the commissioners, who insisted on a balustrade to St. Paul's, none having been originally designed:—"I have considered the resolution of the honourable the commissioners for adorning St. Paul's Cathedral, dated October 15, 1717, and brought to me on the 21st, importing that a balustrade of stone be set up on the top of the church, unless Sir Christopher Wren, in writing under his hand, set forth that it is contrary to the principles of architecture, and give his opinion in a fortnight's time, and if he doth not, then the resolution of a balustrade is to be proceeded with. In observation of this resolution I take leave, first to declare I never designed a balustrade. Persons of little skill in architecture did expect, I believe, to see something they had been used to in Gothic structures, and ladies think nothing well without an edging. I should gladly have complied with the vulgar taste, but I suspended for reasons following:—A balustrade is supposed a sort of plinth over the upper colonnade, which may be divided into balusters over open parts or voids, but kept solid over solid parts, such as pilasters, for a continued range of balusters cannot be proposed to stand alone against high winds; they would be liable to be lopped down in a row if there were not solid parts at due distances intermixed, which solid parts are in the form of pedestals, and may be in length as long as the frieze below where pilasters are double, as in our case, for double pilasters may have one united pedestal, as they have one entablature and one frieze extended over both. But now, in the inward angles, where the pilasters cannot be doubled as before they were, the two voids or more open parts would be in the angle, with one small pilaster between them, and create a very disagreeable mixture. I am further to observe that there is already over the entablature a proper plinth, which regularly terminates the building; and as no provision was originally made in my plan for a balustrade, the setting up one in such a confused manner over the plinth must apparently break into the harmony of the whole machine, and, in this particular case, be contrary to the principles of architecture. The like objections as to some other ornaments, suppose of vases, for they will be double upon the solids; but in the inward angles there will be scarce room for one, though each of them be about 2 feet 9 inches at bottom and 9 feet high. Yet these will appear contemptible below, and bigger we cannot make them unless we fall into the crime of false bearing, which artisans of the lowest rank will have sense enough to condemn. My opinion, therefore, is to have statues erected on the four pediments only, which will be a most proper, noble and sufficient ornament to the whole fabric, and was never omitted in the best ancient Greek and Roman architecture; the principles of which, throughout all my schemes of this colossal structure, I have religiously endeavoured to follow; and if I glory it is in the singular mercy of God, who has enabled me to begin and finish my great work so conformable to the ancient model. The pedestals for the statues I have already laid in the building, which now stand naked for want of their acroteria."

The Elevation in Architecture.

The elevation is to a building what the countenance is to the mind, and either prepossesses in its favour or prejudices with dislike. There are two principles of composition for elevations, the horizontal and the vertical. One of these must predominate. In the Classic buildings of antiquity the former prevailed. The latter arose in the decline of Roman architecture, is triumphant in the edifices of Mediæval art, and reigns throughout with the upshooting tendency in the buildings of the Eastern world, as in the minarets of the Mohammedan and the pagodas of the Chinese.

Microscopic Criticism.

If a difference of size in parts or details exist in a building and be not discoverable unless one takes a compass, a rule, a square, or a level, they are no longer defects. Buildings are not made for measurement but delight. When these discrepancies escape the eye and minute examination can alone detect the irregularity, the beauty of the whole does not cease to affect us. In the Pantheon the angular columns are anti-Vitruvian, being smaller, instead of larger, than the others. At the top of the pediment there is a double modillion; and on one side of the sloping cornice twenty-four modillions, on the other twenty-two. "Bravo," says Milizia, "to him who has counted them, but pitiful-bravo to him who turns up his nose at such microscopic criticism."

NOTES AND COMMENTS.

LOVERS of antiquity are compelled for the sake of consistency to advocate the preservation of trees that are dead. If, as SHAKESPEARE says, ruin can teach us to ruminate, they will ask what more fitting place for the exercise than a forest, "where wasteful time debateth with decay"? But respect should also be given to the infinitely more important principles of life and growth, unless we wish to convert the world into a huge mortuary. The Corporation of London have had to think of present and future needs in the City, and the same duty was imposed on them when they took charge of Epping Forest. But that end cannot be attained in streets or groves without the removal of things that can no longer be of use. There are people who would have Epping Forest neglected like a prehistoric forest, and they have raised an outcry because it was proposed to plant in order to provide greenwoods for a future time. The Corporation, who, of course, are not indifferent to sylvan beauty, have called in five experts, viz. Messrs. A. B. FREEMAN-MITFORD, W. SEHLICH, A. W. WEBSTER, W. ROBINSON, and J. ANDERSON to report on the operations which have been carried out. Their report, which has appeared, states that the beauty of the landscape in and around the forest might be enhanced by making judicious clearings, while the glades already in existence should be increased in number. It is also suggested that bold clearances should be made in the pollard hornbeams, and that the fine pollard oaks should be carefully preserved. In Hawk Wood the trees are not such as would be improved by wholesale thinning, and it would be wise to take out no trees except those which are dying or those stunted specimens which are injuring others. Monk Wood will need no further thinning for many years to come, and the same applies to High Beech. In Theydon High Wood moderate and periodic thinning is desirable. In conclusion they state that they are not prepared to endorse the strictures which have been passed upon the work carried out in the forest, being of opinion that much has been done judiciously and well. In some instances they do not approve of the whole of the action of the authorities, while in others they consider more might have been done. They are certain, however, that the authorities have been actuated by a desire to preserve the finest features of the forest. The report may be said to endorse the views of the Corporation. In criticising an undertaking which depends upon the principles of the picturesque there must be differences of opinion, but it is evident the forest may be safely left to the care of the Corporation.

THE old civil law allowed a finder to retain any treasure he might discover on his own land; but when obtained on another man's land the finder was allowed a half, and the owner of the ground another half. The rule applied in cases where an emperor or a prince was in the latter position. Subsequently all treasure trove was accepted as belonging to the ruler of the state. In England a sort of compromise was arranged. The treasure became royal property only in cases where there was no possibility of discovering the depositors. In modern times, if the objects found have archaeological or artistic interest, they are sent to a museum, and the finders are rewarded if they desire. Little sympathy should therefore be shown to those who have made away with some of the Saxon coins and the gold and silver ornaments which were lately unearthed in Douglas, Isle of Man. The police have succeeded in obtaining some of the treasure, but probably the most valuable part is still missing. Sir JAMES GELL, the Manx Attorney-General, has had to order a jury to be empanelled, in the hope that by an investigation of the circumstances some clue might be afforded to the treasure. It appears the coins and jewellery were turned up with the pick during the excavations for the foundation of a house. At first they were supposed to have little value; some were cast out among rubbish. The labourer had to admit there were two or three dozen bracelets and rings besides numerous coins, and he produced before the jury several samples. A doctor and a clergyman obtained a part of the treasure, but they surrendered it to the police without delay. All that was gained by the inquiry was the announcement that there was risk in keeping any of the objects, and it remains to be seen whether further meetings of the jury will be more suc-

cessful. The lady who owns the ground also claims the treasure against the Crown, and the finder also professes to have a right to it. As Manx law and custom do not always correspond with those of England, there may be a long legal contest before the ownership is settled.

LECTURERS on geology have always a fertile subject in descanting on the waste of money which follows attempts to execute works below the earth's surface without consulting geologists. It is always easy to be wise after the event, and strata are often so irregular that they cannot be diagnosed until large sums are expended on experiments. In Worthing a failure has just occurred which neither geologists, engineers nor contractors could have foreseen. On account of the illness which made the town a desert last year, efforts are being made to improve its sanitary condition. A new water-supply is to be provided. It was decided to sink the well near a spot where the chalk is so close to the surface as to be revealed by every cart-track. But by one of those freaks which are too well known in works, the chalk was not tapped at the site of the well until about 70 feet had been reached. It was also assumed that the ground in which the mains were to be laid would be chalk, but it was found to be full of flints, which were not easily removed, and the excavation is therefore costly. As the whole of the surprises have occurred within a very limited area, amateurs may say there was not sufficient foresight exercised; but geology as a science is always weak unless when it has to deal with formations on a grand scale.

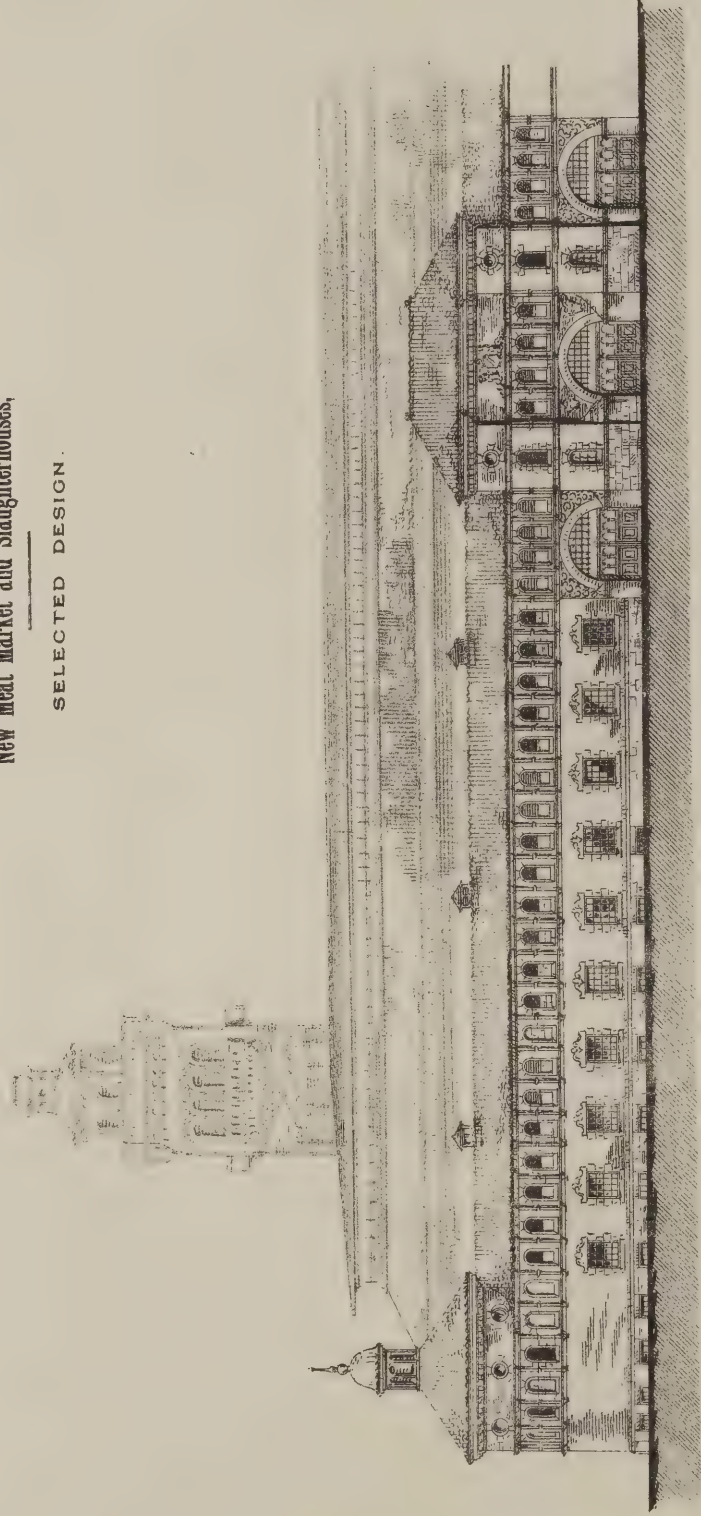
It is satisfactory to find the Lord Chief Justice of Ireland proposing that a contractor's case should be referred to arbitration. In Ireland and Scotland the spirit to which DANDIE DINMONT confessed is very potent, and men find quarrel in a straw for the sake of the prestige which comes from a long course of litigation. In the case before the Chief Justice the plaintiff sought to recover £1,774*l.* 12*s.* 9*d.* for work and labour done, materials supplied, and money expended in the construction and maintenance of water-works for the Corporation of the city of Limerick and for pumping. The defendants stated that the work was done under a special contract, and except as to £184*l.*, which was lodged in court, they did not owe the plaintiff anything. They counter-claim for £3,210*l.* in respect of an alleged breach of contract on the part of the plaintiff in carrying out the works. The Chief Justice considered that if all the legal points involved were pursued, the costs would be enormous. The case, too, said his lordship, might eventually be taken to the House of Lords, and by the time it came on for determination, that tribunal might not exist. The parties prudently agreed to refer the case to two arbitrators, viz. Mr. W. SPENCE and Mr. J. TURNBULL, jun., with power to call in an umpire in case they should be unable to agree as to the amount to be paid to the plaintiff in respect of extra work. The umpire is to be selected by the President of the Institution of Mechanical Engineers, and the inquiry is to be held in Limerick. Arbitration is costly; but in this case it will probably be economical if compared with the expense of trials in the Courts. The words of the Irish Chief Justice might well be taken to heart in other cases, especially as the luxury of a contest in the House of Lords may shortly be not within the reach of those who are willing to pay heavily for the enjoyment.

THERE is so strong a desire for reconstruction in general amongst Frenchmen that nobody will be surprised at the project of M. QUENTIN-BOUCHART, which is to take down the Palais de l'Industrie in the Champs Elysées, where the Salon Exhibitions are held, and to rebuild it in the same proportions but in a better style. The new building could then become one of the attractions of the International Exhibition of 1900. The Palais de l'Industrie was erected for the International Exhibition of 1855, from designs by M. CENDRIER. The great hall, or enclosed garden, which is now used for exhibiting the sculpture, suggests the influence of PAXTON's building in Hyde Park. It was not intended for the display of works of art—in 1855 the Palais des Beaux-Arts was placed elsewhere—and this fact becomes occasionally too apparent during the Salon Exhibitions.

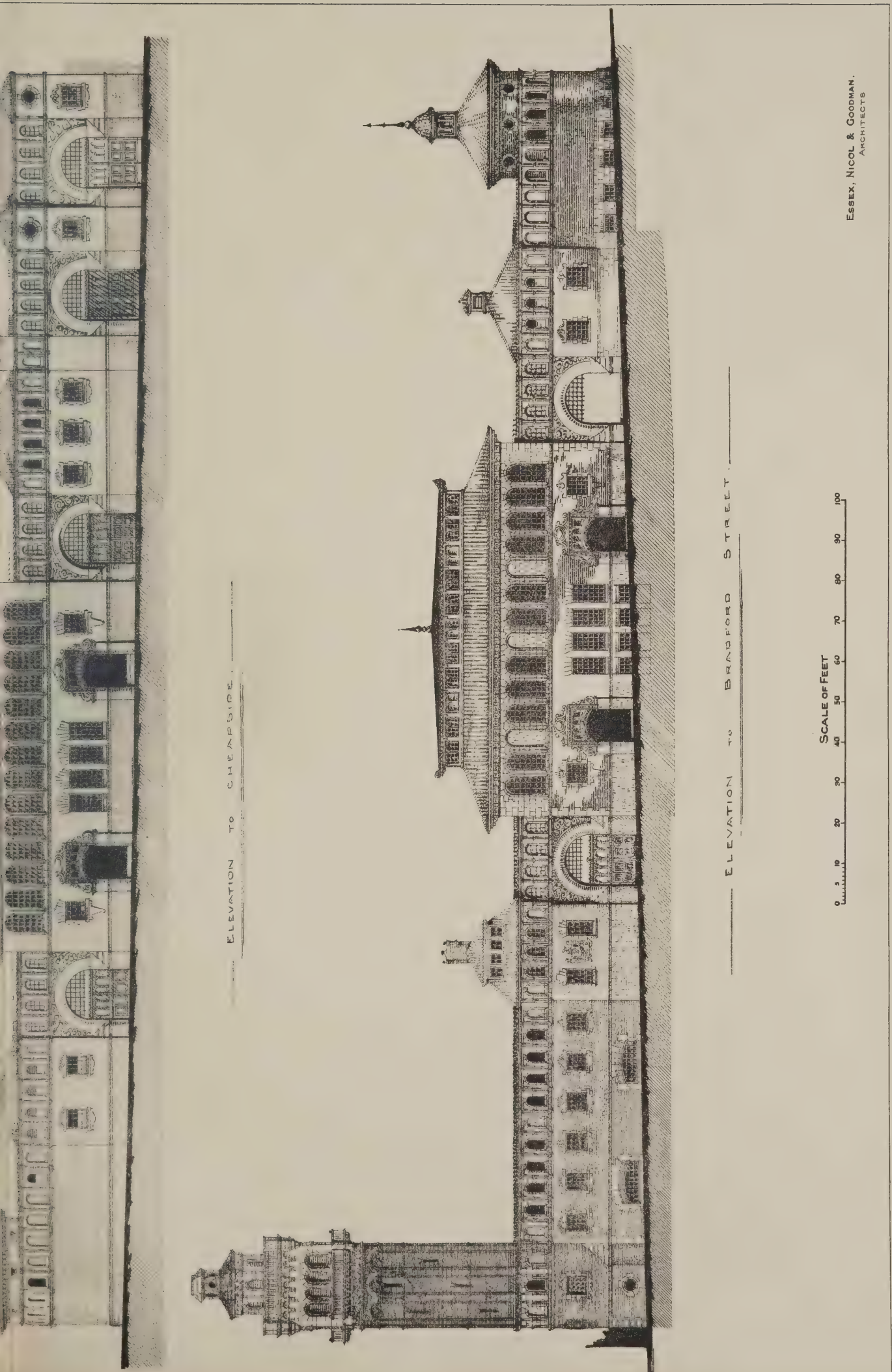
City of Birmingham.

New Meat Market and Slaughterhouses,

SELECTED DESIGN.



ELEVATION TO SHEPLOCK STREET. W.



WEST WALL OF THE TEMPLE OF SOLOMON

ELEVATION OF THE WEST WALL OF THE TEMPLE OF SOLOMON

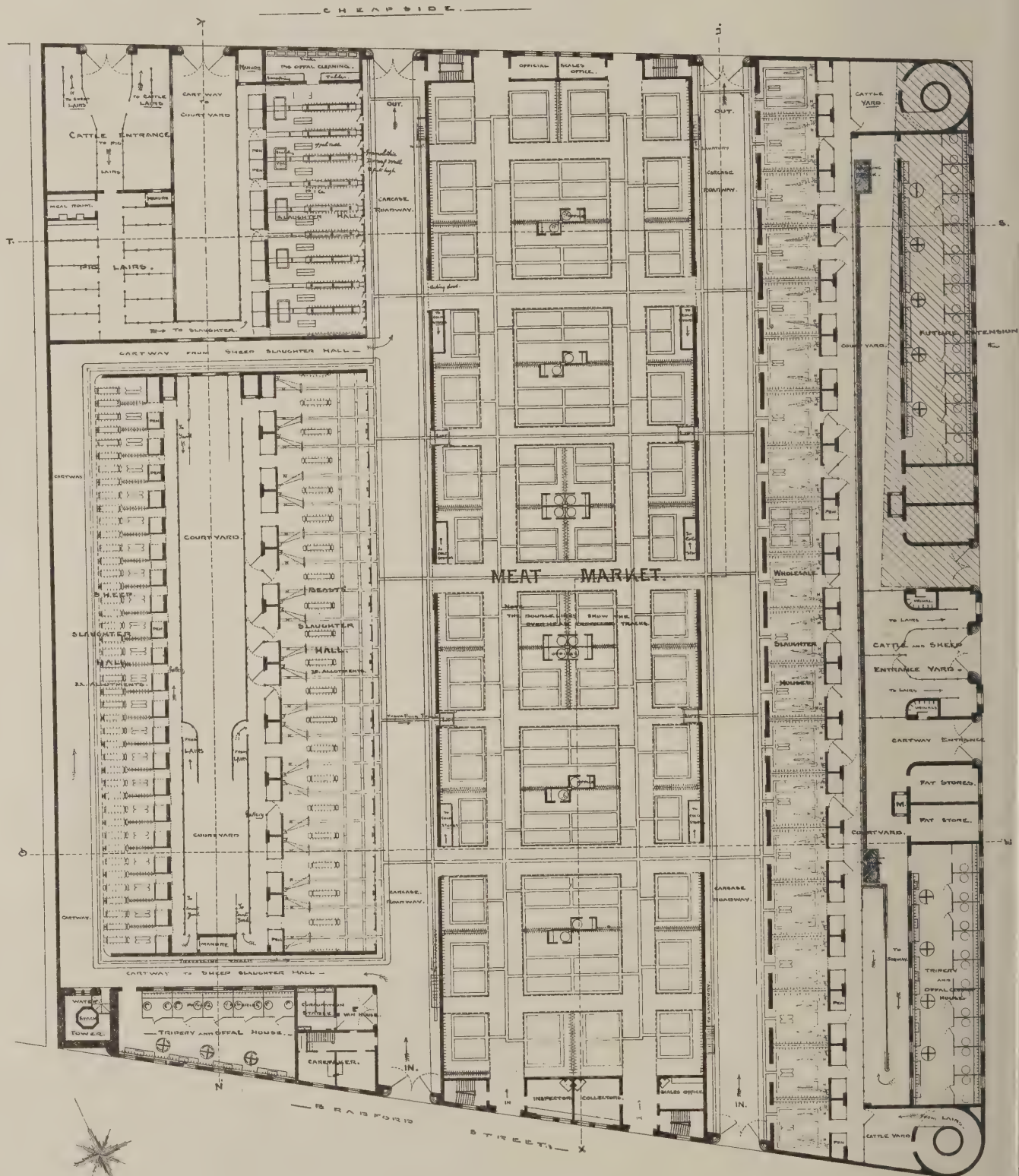
SCALE OF FEET
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ESSEX, NICOL & GOODMAN.
ARCHITECTS

City of Birmingham.

New Meat Market and Slaughterhouses,

SELECTED DESIGN.



GROUND PLAN.

SCALE OF FEET

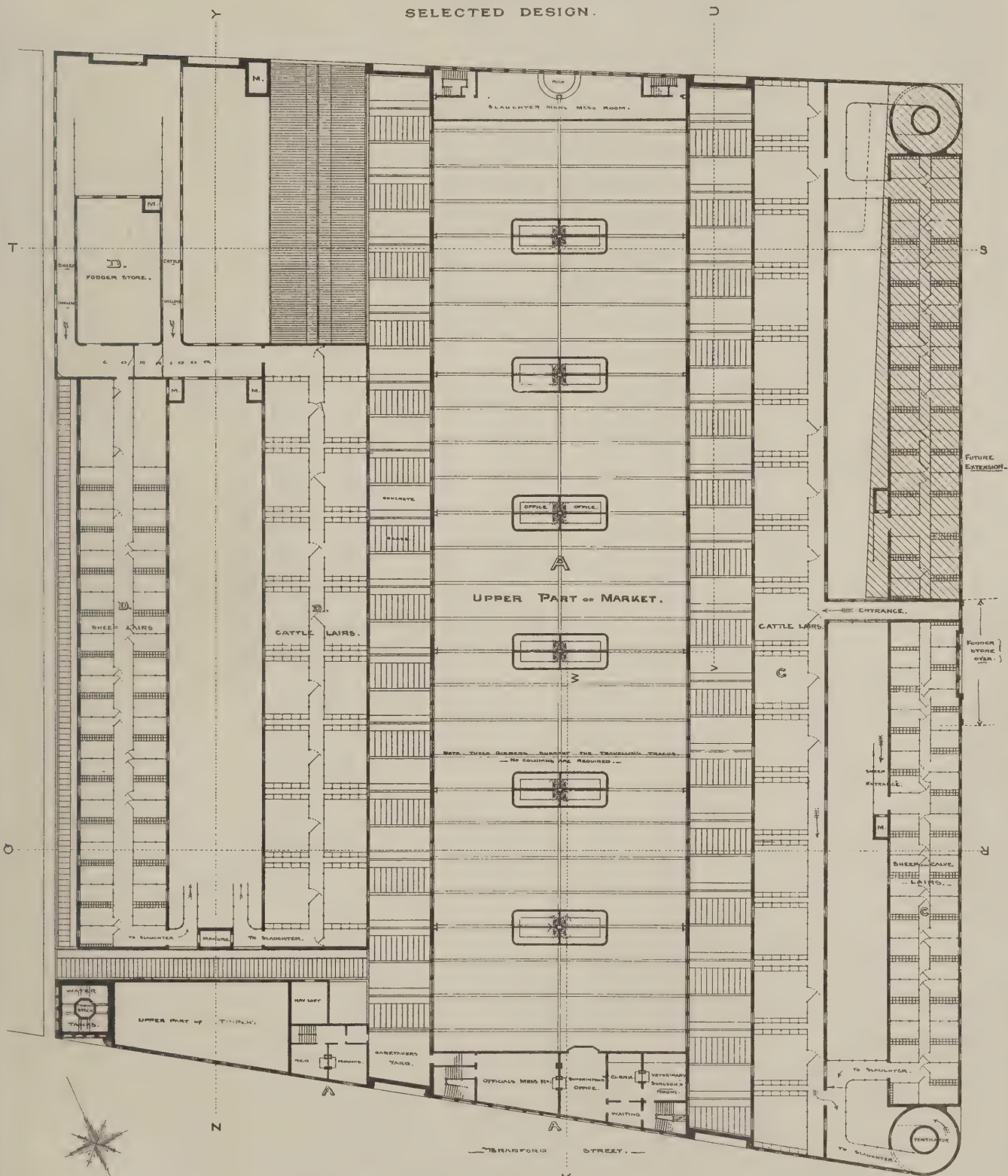


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City of Birmingham.

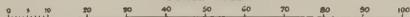
New Meat Market and Slaughterhouses.

SELECTED DESIGN.



PLAN · SHEWING · LAIRS · OVER · SLAUGHTER - HOUSES

SCALE OF FEET



ESSEX, NICOL & GOODMAN.
ARCHITECTS



GARDEN FRONT
JOHN BELT



INK- PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Archibute, June 29th 1894.





INK-PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, PETTER LANE, E.C.

TUDOR CHAMBERS, CORNHILL.
ERNEST RÜNTZ, Architect.

ILLUSTRATIONS.

TUDOR CHAMBERS, 54 AND 55 CORNHILL.

THE illustration we publish of this building is taken from a water-colour drawing by the architect, Mr. ERNEST RUNTZ, of 22 Moorgate Street. The site, which is prominently situated in Cornhill, adjoining the main entrance to St. Peter's Church and the London and Midland Bank, although not having a large area, has an extensive frontage, the ground-floor portion and basement being appropriated entirely for shop purposes, and the entrance for the office portion, with lift to the upper floors, being in St. Peter's Alley. The building is to be faced with the so-called pink terra-cotta, but in this case no effort will be made at uniformity, but rather variety in the shades of the finished material. By adopting this course it is anticipated that the general harmony of the building will be greatly improved. Certainly it will be a useful experiment, and will be watched with interest by architects who favour the material in question. From an artistic point of view, we are of opinion that it is likely to prove very satisfactory. The style adopted by the architect is a somewhat free treatment of Tudor work, refining much of the ornament in the direction of Italian Renaissance. The building, although designed for letting as shops and offices, could be easily adapted for the occupation, as a branch, of some large insurance or other company, for which purpose it will probably be used, as its position is unique. The terra-cotta work is being carried out by Messrs. DOULTONS, and the modelling has been under the supervision of Mr. NEATBY, who has caught the spirit of the detail in a masterly manner. The general contract is in the hands of Messrs. COLLS & SONS, of 5 Coleman Street, and the works are to be commenced forthwith.

GARDEN FRONT.—ENDALLS MANOR.

SELECTED DESIGN FOR NEW MEAT MARKET AND SLAUGHTER-HOUSES FOR THE CITY OF BIRMINGHAM.

WE publish this week reproductions of the elevations and plans by Messrs. ESSEX, NICOL & GOODMAN, which have been adopted by the Birmingham Corporation for the new markets. It is not often architects are allowed an opportunity in this country to prepare similar plans, and therefore most of the works on the subject are by foreigners. As Messrs. ESSEX, NICOL & GOODMAN have taken great pains to study those works as well as the foreign examples they describe, our readers will be glad to have the elaborate description which accompanied the plans, and which explains the principles on which they were based:—

1. Realising the importance of placing all the slaughtering departments on one level, those selected to be placed on the meat market level are the three retail slaughter-houses, wholesale slaughter-houses, pig lairs, triperies or offal houses, cattle and sheep yards and gangways, leaving ample open space between same.

2. The cattle and sheep lairs are placed over the slaughter-houses, the entrances, one on each side from the streets adjoining, communicate direct by inclined ways from the entrance yards, and from the lairs to the pens in rear of the slaughter-houses by separate inclines; the animals are thus entirely isolated from the working parts until wanted, and are always moved in one direction.

3. The working spaces are in single rows, and as on the retail side there is insufficient length for all in one line, the slaughter-house for calves and sheep is placed in rear of that for beasts; this arrangement has the advantage of each allotment having a standing space for butcher's cart in the roadway and ample room for others to pass.

4. As the land falls towards the river Rea, advantage of this is taken by raising the sheep slaughter-house floor and lowering the roadway between the sheep and beast retail slaughter-house, thus obtaining a lower ground floor, the greater part being above the street levels.

5. The yard on the retail side is thus upon the present solid surface, and the subway under meat market only a few feet under that.

6. An examination of the plans will show how capable this plan is of extension on the retail side, as by repeating the alternate blocks of sheep and beast slaughter-houses, with yards and roadways between, and continuing the carcase roadways to the meat market, any future extension will be part of the same design.

7. As a general model for a good working abattoir the

establishments built during the period of Napoleon I. in Paris have been used by Architects who have been entrusted with the erection of abattoirs, and may with advantage be followed in this case. For our information we have obtained these plans, and others that closely follow the same arrangement. At Buda Pesth there is a central cold-room which takes the place of the meat market in your scheme. Hamburg we consider to be the most perfect modern example visited by us; the working details of every department have been studied by us, and the width of the spaces allotted to the working departments have been adopted in this design.

From the above remarks it may be concluded that we have not attempted to produce a novel design, but rather to find out established and fixed principles and apply them to the given circumstances.

A. THE MEAT MARKET.—The position of the meat market is that suggested by the committee, with roadways on either side. Additional doorways are introduced for the overhead travelling tracks and jennies. The windows throughout this are arranged vertically in the walls and roof, glazed in iron frames, with two parts to open as hoppers for inlet of fresh air. The outlets are the louvres in roof. The eaves project 5 feet over the line of the wall, to keep out the direct rays of the sun; the roof lights are continuous, having the eaves projected 4 feet. The roof trusses are framed up with steel lattice girders and joists. The flat will be laid with a granolithic flooring, spanning from girder to girder, and on the top of this will be spread gas-breeze concrete with falls to the eaves, covered with impervious asphalt. The sloping part of the roof will be laid with red pantiles similar to those in the Birmingham Council-house. At the end of the market adjoining Bradford Street a small portion of the ground-floor area is occupied by the inspectors' and collectors' offices and staircases to the superintendent's office and official rooms over same. Outside the market adjoining these offices is placed the caretaker's residence, which is also in close proximity to the official block and the Corporation stable and van yard.

FITTINGS AND GEARING.—The fittings and gearing shown and which we would propose using are on the most modern and approved system, and by referring to the detailed drawings it will be understood how simple they are in working. The system of overhead travellers can be taken wherever required, and as the turning points require no handles they may be placed anywhere, and they may be fitted so as to suit any class of trade. Over the market spaces or slaughter-houses two angle iron travelling tracks are suspended at a few inches apart, forming right-angle junctions; between these angle irons are suspended the travelling jennies, which are carried by a pair of small wheels on the top of same; these are placed at the most convenient height for conveying beast carcases, and may be slightly inclined to suit the working; sheep and pigs and smaller animals would be hung by lengthening hooks for three, four or six at a time from the same jennies. At each right-angled junction the jenny hook is slightly checked by dropping into the space between the two tracks, and if it is required to proceed in either of the four directions from any particular point it is only necessary to twist the jenny round and the wheels will adjust themselves. The rails can be used partly for fixed hooks and partly for travelling hooks, so that carcases may be run straight into the various market spaces and remain there, or be taken off and put upon the fixed hooks, and the jennies returned to the slaughter-house.

It will be observed from the plans that the various avenues and blocks of spaces allotted to the butchers have in every case two sides exposed to the roadway; this is to give as much outward hanging space as possible. The whole system is suspended from lattice steel girders, forming a gridiron for hanging rods at about 12 feet apart in every direction. The carcases for the cold stores would be run on the same hooks, and having been conveyed to the lifts would descend and be taken inside each chill-room, where the carcases can remain on the jennies until required, or be removed to the fixed hooks. The point kept in view in arranging these fittings is to have every traveller of the same pattern, so that the whole may be interchangeable.

1. INSTALLATION FOR CATTLE.—*Wholesale Slaughtering Stalls.*—Twenty stalls, each consisting of two patent self-lowering self-sustaining rope hoists for fixing into wall, with requisite guide sheaves, wire rope, rings, iron beams with hooks, brackets, columns, trellis partitions. *Retail Slaughtering Stalls.*—Twenty patent self-lowering, self-sustaining rope hoists for fixing against the wall, with the requisite guide sheaves, wire rope and rings.

2. COMPLETE OVERHEAD TRACK FROM THE SLAUGHTERING STALLS TO THE MARKET.—About 2,000 yards of track, with necessary girders, brackets and hangers, fifty travelling jennies and hanging-bars.

3. FOR SHEEP AND CALVES.—Two hundred yards of flat bar with 500 steel hooks and two brackets.

4. FOR PIGS.—Five independent revolving cranes, or travelling crabs, if preferred; five scalding tubs, with fittings

complete; ten iron shaving tables; iron beams, with 396 fast and 180 loose steel hooks, travelling track; ten travelling crabs; nineteen columns, cross girders, &c.

5. WASHING ENTRAILS.—Thirty-two cells, each consisting of two tubs, with fittings complete, iron beams with 350 movable steel hooks and brackets.

6. PIG PENS.—Ten patent doors opening at either end; sixteen doors opening at one end; fifty-eight cast-iron columns and the necessary trellis partitions.

7. MEAT CELLS.—Eighty-four complete meat cells, consisting of iron beams with fast and loose galvanised steel hooks, wrought-iron pillars and cross bars, trellis partitions built of angle iron and flat iron and stout galvanised wire netting, galvanised iron frame and door.

8. DISEASED CATTLE.—Three patent self-lowering self-sustaining rope hoists, with the requisite guide sheaves, wire rope, hanging bars, rings, one scalding tub, one track and travelling crab, beam with galvanised hooks and brackets.

9. SUNDRIES.—Consisting chiefly of cars, tables, stands, blood-collecting vessels, buckets, &c. The whole fittings, in weight about 170 tons, would cost about 5,000*l*. Each space allotted to a butcher can have a convenient office arrangement as shown, consisting of a lower office, with desk-room for one or more persons, and a small spiral iron staircase to a room over, which could conveniently contain three or four persons.

B. SLAUGHTER-HOUSES FOR WHOLESALE BUTCHERS.—These are placed in the position shown on your plan, and are spaced so as to give twenty separate houses, divided by iron grills, and are sufficiently wide and fitted up so as to allow two slaughter-men working in them at the same time; and also space for one killing sheep or calves. There is one doorway to each slaughter-house from the yard, with a pen at either side, so that each slaughterman can have his next animal penned on his own side; the killing points are immediately within the doorway about 2 feet 6 inches from the jamb, and we suggest that the Manchester pattern be adopted. The arrangement of the hanging fittings will give ample space for setting before the carcasses are removed into the meat market; extra rails can be introduced to suit the special trade of any butcher. On this side of the market hall the animals are brought into the slaughter-houses on the same level as that of the adjoining yard, they will be conveyed within a 6-foot wide gangway, railed off from yard with gates at convenient points.

C. LAIRAGE FOR SHEEP AND BEASTS FOR WHOLESALE BUTCHERS.—These are placed over the slaughter-houses and partly over the block of buildings adjoining Sherlock Street on the same level; we do not consider that there is sufficient area over the slaughter-houses to lair the number of beasts asked for unless the sheep are placed in a storey over the beasts, which would increase the height of the buildings and interfere with the lighting of the market hall. The approach to the lairs is from Sherlock Street into a convenient yard, where the animals can be examined; the sheep would pass along the inclines on the left to the lairs over the block of buildings next Sherlock Street; this is one long hall with a central avenue, divided up into convenient pens with racks between. The arrangement proposed is to conduct the animals through the layers one way only, so that animals entering will never have to meet those coming into the slaughter-houses; the exit from the lairs to the slaughter-houses is at the further end from the entrance, and has similar inclines communicating with the corridor above described in connection with the slaughter-houses. To each sheep is allotted a space of 6 feet superficial and 1 foot in length along the feeding rack. In connection with these lairs the fodder store is placed over the entrance yard, and is an isolated fireproof apartment with iron doors; from this store the fodder and litter will be meted out to the various butchers. The beast lairs are arranged over the slaughter-houses and projecting over the pens in the rear of the same; they are arranged in one long hall with a corridor at one side, the lairs being divided up as is usually done in byres, that is, with tying spaces right and left, giving 24 feet superficial to each animal, and a corridor between the rows of animals; these lairs would each contain ten animals, each block would be closed by a gate and may be used as loose boxes. Between each lair a feeding and watering passage is arranged. Water will be laid on at the end of each feeding corridor, and a cast-iron trough with hinged cover running towards the outside wall, with drain at the outer end passing through the wall to the court below. The manure drain from these lairs would be taken below the floor level and covered with gratings, and having catch pits at various points and drains taken down into the main open gutter in yard. The roof is open timbered upon iron trusses, giving air space and ventilation to the animals; special ventilators are placed along the roof.

D. SLAUGHTER-HALLS FOR RETAIL, &c., BUTCHERS.—These slaughter halls are arranged so as to give as much air-space and open working as possible, and in this respect they will be similar to the halls at Hamburg, and in our own country on a smaller scale at Bradford. The points we have aimed at are to give as much slaughtering accommodation as possible in

single rows; we find it impossible, without crowding, to obtain the necessary accommodation in one row, therefore we have placed the sheep in rear of the beasts as regards the market hall, but having equally convenient access by the addition to carcass roadway.

The pig slaughtering-hall is placed at the Cheapside end of the carcass roadway; it is conveniently near the pig lairs, which are on the street level.

Another point which we have kept in view is not only the convenience of passing the meat from the slaughter-houses by the overhead runners into the market hall, but that every butcher who uses the killing spaces has a frontage to a roadway and standing space for his own cart, so that there should be no jostling or inconvenience at loading-up points. The slaughter-hall for beasts has a door to each pair of slaughtermen, as on the wholesale side, each slaughterman having a pen communicating with the corridor outside, which in this case is above the level of the roadway. The corridor is formed by projecting the flooring upon girders on cantilevers. The overhead travelling jennies and gearing generally is the same as that on the wholesale side.

The sheep slaughter-hall has a single door to each allotted space, with separate pen to each entering from the corridor in the court between the sheep slaughter-hall and the beast slaughter-hall. The sheep hanging hooks are arranged on each side of each allotment, and the overhead travelling gear passes the front of each allotment with a short piece at right angles, so that a number of sheep may be arranged upon the hanging hooks ready for travelling into the market as may be required, in addition to the ordinary sheep hanging hooks at each side.

The pig slaughter-hall, which is in the same line as the beasts, is of the same widths, and is approached from a similar corridor in the rear, the pigs passing across a bridge from layers on the opposite side of the cartway. It is proposed that they be struck in the enclosed pens immediately outside the slaughter-hall, as is done at Bradford, and that they should be afterwards picked up upon the travelling-crane and placed in the scalding vat, &c., afterwards being finished off upon the dressing hook, which may be raised or lowered for convenience by a pulley block. We have provided one scalding tank to each pair of slaughtermen, but one set of overhead travelling crabs to each. This slaughter-hall is made higher than the others; on the roof are ventilators to carry away the steam arising from the scalding tanks. The sheep and beasts slaughter-halls are divided from the carcass roadway by a granolithic wall 8 feet high, having doorways to each allotment.

The lairage for the animals to be slaughtered on the retail side is placed over each slaughter-house. The pigs are laired on the same level as their slaughter-hall; on leaving the street the animals enter a yard similar to that on the wholesale side; from this yard two inclined gangways are provided to convey the animals to their respective layers; the pigs pass through on the same level. In the pig lair is provided a small meat room and feeding pen. The lairs for sheep are similar to those described on the wholesale side; the animals pass along through the lairs down the inclined gangway on the other side to the corridor behind the slaughter-halls. This also applies to the beasts. The fodder store is placed over the pig lairs and conveniently near the entrance yard for animals; it is also a fireproof building, with iron doors and windows, and being placed on the same level as the lairs it is convenient for access, and the fodder and litter would be meted out as before described.

E. DEPARTMENT FOR THE STORAGE OR COLLECTION OF ROPES, &c.—In arranging this department, we have placed the tripe-dressing and boiling and offal-houses on the same level as the slaughter-houses, and the department for the collection of ropes, feet, heads, skins, &c., can as conveniently be placed on a lower level on the retail side, or on the opposite side of the cartway in the wholesale. These triperies or offal-houses, as they have to deal with a large number of small articles, must necessarily cover considerable space, and we think it advisable that each side, viz. the wholesale and retail, should be provided with separate departments for this work; that for the retail is placed adjoining Bradford Street; the offals can be readily run in upon a small truck. That on the wholesale side is placed along Sherlock Street, and, although we consider it may be sufficiently large for present requirements, we suggest that when the lease of the part coloured blue on your plan is obtained, that another offal-house be erected so as to complete the design. Triperies are arranged so as to accommodate those who may require lock-up apartments, and also to suit those who may be satisfied to work in the open hall. The small rooms are divided off by wooden partitions 7 feet 6 inches high, with two steam jacketted boilers, gut hooks, scraping boards and sinks complete in themselves; whilst in the open hall they are arranged along the walls, scraping-boards and sinks and jacketted boiling pans divided into four, so that four persons may use the same pot. Each of these triperies are well lit, and have ample means of cross ventilation as the windows are on both sides. The storage of ropes, feet,

hides, &c., are arranged on the floor underneath the beasts' slaughter-house, and are approached from the cartway entrance from Cheapside.

We have shown what we consider at present to be a sufficient number of these stores, but there is ample room for extending this accommodation. The departments for blood separation are in duplicate, so that it is unnecessary to carry the fresh blood far; after the clot is separated it is removed to the blood manure machine from the wholesale side by the subway. The blood separating for the retail side adjoins the blood manure machine. Both these departments are cross ventilated and well lit.

F. COLD STORES.—The storage chambers are placed in a block underneath the market hall, and isolated by a corridor or air-passage from the surrounding earth. The floor between the market hall and the cold stores would be sub-ceiled or hollow, and contain cold-air passages to each cold store; underneath the cold stores and between them and the ground there is also a series of air-passages. The hollow walls surrounding the cold stores underneath and over same to be packed with silicate cotton. The approach to these cold stores is either from the subway which communicates from the wholesale and retail, or by the lifts, two on either side of the market hall, by which carcasses can be readily dropped and run along the corridors on the travelling gear to any apartment. Inclined ways are also provided to the doorways of the market hall. The passages around the cold stores are lit by area windows from the covered roadways. On the sheets of details are shown the separate compartments; the jennies would be continued into these stores.

G. ENGINE AND MACHINERY DEPARTMENT.—These are placed so as to adjoin the refrigerating plant. A steam boiler for generating low-pressure steam for boiling up water by the injection of steam is provided and pipes taken to all the slaughter-halls. The pumping department is placed immediately adjoining the boilers and the tank for the artesian well, &c. The water tower will contain the cold-water storage tanks—is also used as the chimney stack, which is in the centre of it; there will be accommodation for the storage of sufficient water to allow for an average use of forty-five gallons for each animal slaughtered—it has been computed that every animal slaughtered requires about this quantity.

H. MESS ROOMS, &c.—The mess room for the market officials adjoins the offices, and is in communication with the caretaker's house; that for slaughtermen is placed over one end of the market hall. We have selected this position as being light and airy and convenient, and no detriment to the market hall itself.

The closets and lavatories are provided for in four separate blocks—one for officials and market-keepers, two for slaughtermen and one for the general public—at each entrance to the covered carcase roadways; they are placed underneath the roadway so that there may be no objection to them, and they can there be made sufficiently large to give accommodation for lockers for the men and for wash and brush up; access is obtained by a short stair from the roadways and also from the staircase at the ends of the market hall.

I. APPARATUS FOR DESTROYING CONDEMNED MEAT.—This apparatus is placed on the retail side entering from the courtyard and underneath the sheep slaughter-house; it consists of a condemned lair, a slaughter-house with all necessary apparatus, and a room for the meat-destroyer; this room adjoins that of the blood-manure machine. Manure repositories are placed in the yards with entrances at the various floors from the galleries, lairs, slaughter-houses, &c.; they are continued upwards of an equal height and are finished with open ventilator-tops.

DRAINAGE.—The system of drainage is shown on the plans and sections, and consists of four large reservoirs or settling tanks placed in each yard, into which will be directed the open drains, with grated covers. Each slaughter-house will have an open channel for conveying water and bits outside the doors of each allotted space in the rear; it will then be taken down to the court level, where it will pass along the cast-iron channels with grated covers to the settling tanks; these tanks will have overflows with falls to the drains in Cheapside and Bradford Street. The tops of these settling tanks will be hinged, so that they may be cleaned out daily. The soil drains from lavatories will be taken by a separate system to main sewers. The rain-water system of drainage is kept entirely clear of this sewage system, and as sufficient water will have to be used daily for carrying the sewage and refuse to the settling tanks, rain-water tanks are provided, so that this water may be automatically used in flushing, &c.

ROADWAYS.—The roadways, yards and cartways are arranged so that they may not interfere with the animal traffic; the main court on the retail side is approached from Cheapside, and gives access to every department on this side, as well as to the cold stores, whereas the entrance from Sherlock Street on the wholesale side gives ample accommodation for carts independently of the carcase roadways; in fact, this scheme which

we lay before you is based upon the principle that as the site is restricted, it is necessary to economise and proportion to each department the accommodation required, and by maintaining the system we have shown on this plan we believe a good working abattoir would be the result.

VENTILATION.—Having carefully considered the question of ventilation and provided for thorough and cross ventilation throughout the slaughtering halls and lairs by means of louvred windows and roof outlets, yet we consider that a system of ventilation by propulsion would be advisable in the basements and in the meat market, and we would suggest that the chilled air be blown through shafts to outlets by the fans at work in connection with the refrigerating plant.

METHOD OF CONSTRUCTION.

Walls.—The construction generally to be fire-resisting, woodwork only being used where necessary. The walls to be of good sound brickwork, with picked red facing to those elevations exposed to streets, and buff terra-cotta dressings, sills, lintels, &c. So as not to obstruct the space in market, &c., with buttresses, open light and deep lattice-girders are introduced to stay the building over the travelling jenny level; the offices will be supported from these.

Floors.—The floors throughout to be of breeze concrete, arched on soffit and finished with granolithic paving, and skirting of same carried 12 inches up the walls.

Glazed Bricks.—The inside walls of the meat market and slaughter-houses to be lined with white glazed bricks, as suggested, and the carcase roadways on ground floor, and engine-room and corridor round cold stores and the cold stores with brown salt glazed bricks.

Steelwork.—The floors and roofs to be carried by steel girders, lattice-girders and trusses; the roofs with pitch-pine rafters and close boarding; the whole of roofs to be covered with red pantiles with overlapping joints. The roof plumber-work and down-spouts for rain-water to be of fine cast-iron with flashings of 5-lb. lead.

Doors.—The doors throughout the slaughter-houses, including the screen doors between carcase roadways and slaughter-houses, to be 2½ inches thick, framed and braced with 1½-inch V-jointed panelling (all internal doors having the upper panels filled with open grills), hung either with rollers overhead or hooks and long bands. The doors to fodder stores to be of sheet iron.

Roadways.—The roadways for carts to be laid with wood-block paving laid in pitch upon concrete beds. The other roadways and footpaths to be brought up to levels with solid excavation and concrete bottoming, and finished with granolithic paving with falls to gullies.

Offices and Caretaker's Residence, &c.—These to be finished in adamant plaster, with doors, architraves and usual house finishings.

Lavatories.—To be lined throughout with brown salt glazed bricks, and pitch-pine divisions to closets, those for workmen with lock-up cupboard, &c. The sanitary fittings to be of glazed earthenware.

Separate Drains for Rain-water, Slaughter-houses and Sewage.—The rain-water drains to tanks to be of glazed earthenware, with all necessary junctions, &c. The drains in slaughter-houses to be open channels in the flooring, and when continued outside to be of cast-iron troughs, covered with iron hinged gratings to catch-pits. The sewer drains to be of glazed earthenware.

Cattle and Sheep Gangways and Gates.—These to be supported upon and cantilevered out with steel joists, and to have granolithic flooring, with wood bar steps for foothold, and to have framed steel railings and gates, with drawn tube bars and hooks and fixing blocks of granolithic stone.

Lairs and Pens.—The fittings to lairs and pens to be of drawn tube screwed into cast-iron newel posts, and gates to pens secured to granolithic blocks. The cattle lairs to have drinking-troughs and hay-racks, the sheep to have feeding-racks, and the pigs a feeding-pen with boozing-trough, &c.

Cold Water Supply.—The cisterns in water tower to be connected throughout the buildings, with iron pipes to the various smaller cisterns and stand-pipes in yards.

Hot Supplies.—Each slaughter-house, hall and tripery to have hot water laid on from cisterns placed at convenient points; these cisterns to be heated by steam coils.

The buildings will take over two years to construct, and it is intended that they be opened before the end of 1896. The total cost will be 50,000*l*.

An Exhibition of pictures, drawings in black and white, wood engraving, printing, bookbinding, leather work, wood-carving, furniture, and metalwork, designed and executed by members and associates of the Society of the Quest and Guild of Handicraft, has been held in Birmingham this week.

A VISIT TO CLUNY.—II.

THE following is the conclusion of the description of Cluny Abbey, furnished to the *Glasgow Herald* by Mr. Dalrymple Duncan. It is deplorable to follow the story of the decline of the order culminating in the destruction of the abbey. As has already been mentioned, the Cluniacs, despite the rigorous basis on which the order had originally been established, were at an early period of their history betrayed by their wealth and power into habits of laxity, and it was as a protest against their luxurious mode of life that the Cistercian Order was founded in 1098 by Robert de Molesmes. As time went on this lack of discipline continued to prevail, and nothing can have contributed more to it than the unfortunate system which prevailed in later times of appointing Abbés Commenditaires ("vraye sappe de l'estat monastique et ruine des bonnes monasteres") who were either church dignitaries of high rank or younger sons of the great houses. These "Tulchan" abbots (among whom were men of the type of the Cardinal de Guise, Richelieu, Mazarin, the Prince de Conti, &c.) were merely tempted to accept the post by the revenues attached to it, and being uniformly non-resident had no interest either in furthering the welfare of the order or putting an end to the abuses which existed in it. During the latter portion of the eighteenth century disaffection arose among the tenants, and the rents and tithes became difficult to collect. The first indication of the gathering storm was the descent on the Abbey of July 29, 1789, of an armed band of peasants intent on plunder, but though the townsfolk of Cluny had had their own quarrels and disputes with the monks they rallied to the rescue, and the marauders were driven away. The final blow was not long delayed, for it could not be expected that the possessions of the Abbey, diminished though they were, would escape the unscrupulous and greedy hands of the National Assembly; and by a decree of that body, dated November 2 and 4, 1789, the goods of the monastery were confiscated. The monks were not at first disturbed, but orders for their ejection were subsequently issued, and in October, 1790, they were driven forth. The municipality of Cluny seems to have done everything possible to save the church and secure that the monastic buildings should be devoted to some great public purpose, such as a hospital for veterans, &c. Again and again representations on the subject were presented, but the efforts were futile. On April 21, 1799 (2 Floréal An VI) in the days of the Directoire, long after the fall of Robespierre, and at a time when one would have expected better things, the church, the abbot's palace, the domestic buildings and the extensive gardens were sold to three speculators at the price of 2,014,000 francs. The purchasers very soon set about the removal of the monuments and interior ornaments of the church, whereupon the indefatigable municipality addressed a complaint to the Préfet of the Department, who forwarded it to Chaptal, the Minister of the Interior. The latter replied in November 1800 condemning the spoliation, and ordering it to be put a stop to. In the following year an expert who had been instructed to examine the church reported that, although the roof needed considerable repairs, the building was still intact, and strongly urged upon the Government the duty of re-purchasing from the proprietors so important a monument. All was vain, and the purchasers, who had been willing enough to come to terms, proceeded to make the most of their bargain. In the end of 1801 they drove a street right through the nave of the church, but the building, though mutilated, was not as yet irretrievably destroyed, the choir and the two transepts being still untouched. Strong efforts were put forth to save them, and as the kaleidoscopic Government of France had now taken the form of the Consulate, hopes were entertained that the mistaken policy of the preceding years would be reversed. Not a finger was, however, raised, and the work of destruction began, the operations extending from 1806 to 1817. The pulling down of the façade took place in 1810, requiring nine days' constant work; and, according to Bouché, a contemporary writer, the *débris* amounted to 640 cubic mètres of rubble, without counting hewn stone. In 1811 the northern arm of the great transept was destroyed. So strongly built was it that seventy-five mines were exploded in it before its demolition was accomplished.

Thus perished by the insensate folly and the crass supineness of Frenchmen a church which, had it been preserved, would have been one of the chief architectural glories of their country.

The main portion of the site is now occupied by a *haras*, or Government breeding-stable, a class of institutions established throughout France for the purpose of improving the quality of the horses, and the only parts of St. Hugues' great work at present existing are some fragments of the south wall of the nave, and the southern arm of the great transept with its tower. The latter was saved by the efforts of a maire of Cluny, and has been formed into the chapel of the Ecole Normale de l'Enseignement Spécial, which now occupies the remains of the monastic buildings. As the traveller stands in this truncated fragment, whitewashed and inartistically furnished though it at present is, he cannot fail to be struck by

the loftiness of the vaulted roof and the massive simplicity of the architecture, and can faintly conjure up a vision of what the stately Romanesque pile must have been in the days of its pristine magnificence.

Some of the later additions to the church have also been preserved in the shape of the Chapelle de St. Martial, the Chapelle de Bourbon, the Chapelle de la Congregation, and the Sacristy. The two latter, which are now respectively the chemical lecture-room and the drawing-class room, only date from the middle of last century, and possess no interest, but the two first-mentioned chapels are fine specimens of late Gothic. The Chapelle de Bourbon derives its name from its founder—the Cardinal Jean de Bourbon, abbé of Cluny, 1456-80—and was built at the southern extremity of the eastern transept. Round it there project from the walls fifteen finely-sculptured half-length figures of patriarchs and prophets, forming corbels or consoles, on which in former times stood fifteen noble statues of the Virgin, St. Paul, St. John the Baptist, and the Twelve Apostles. All the latter have disappeared. At the side of the chapel is a small room, vaulted and highly ornamented, provided with a fireplace and a window commanding a view of the *maître-autel*. Here the abbé was able to sit in dignified seclusion and assist at the offices. It is very like the similar apartment attached to the Beauchamp Chapel in the church of Warwick.

The domestic buildings of the abbey are to a considerable extent intact, although the refectory, kitchens, &c., have been destroyed, but while they are very extensive and well and solidly built, they are of little architectural importance, the greater portions of them only dating from the latter half of last century. The earlier buildings which the presently-existing structures replaced were erected at various periods, and must have been of great interest. Part of them dated from the abbottship of St. Odillon, the refectory was built by St. Hugues, and the great cloister was the work of his successor, the Abbé Pons de Melgueil, 1109-22. Probably because the diversity of the architectural styles offended the taste of the eighteenth century for dull uniformity their removal was decided on at the suggestion of Dom Dathoze, who held the office of prior under the last two abbots, Frédéric Jérôme de la Rochefoucauld and Dominique de la Rochefoucauld. The reconstruction was begun in 1750, and was continued up to the time of the Revolution, at which latter period nearly all the old buildings had been destroyed, and arrangements had been made for the demolition of an interesting edifice to the west of the great cloister known by the name of the Palais de Pape Gélase, from the fact that it had been the residence of Gelasius II., who, when driven from Rome, sought refuge at Cluny, and died there in 1119. The events of 1789 arrested the further progress of these barbarous operations, and the stately dwelling of the old pope was spared to linger almost to our own day, surviving till 1873, when for no particular reason it was pulled down and re-erected in a similar style. The only existing portions of the earlier structures are the old abbey mill, the bakery (now formed into a blacksmith's forge), and the stable for guests' horses (now a corn market).

The vandalism of the monks in destroying buildings of so much architectural value was only a little less heinous than the action of the persons responsible for the demolition of the abbey church, and must have provided the latter with a ready retort to the attacks which were made on them.

The abbot's palace has in great measure been spared. It latterly seems to have consisted of two distinct structures connected together, though by the disappearance of the intermediate buildings they now stand separate. The earlier portion, which was erected by the Abbot Jean de Bourbon in the latter half of the fifteenth century, has to some extent been spoiled by having its lower storey converted into a school, but the upper floor is perfectly preserved, having with much appropriateness been formed into a museum and library. Two fine halls (each of which has a beautifully-sculptured chimney-piece) contain a collection of articles saved from the wreck of the abbey, the most notable being a great coffer of the fourteenth century which formerly contained the famous *Rouleaux de Cluny*, a duplicate of the catalogue of the privileges of the Holy See deposited by Innocent IV. after the Council of Lyon in 1245. In a small adjoining cloister have been gathered together a number of exquisitely-carved capitals from the abbey church, and the remains of some of the tombs of abbots and other distinguished personages who were buried in it. A few of the valuable MSS., charters, &c., belonging to the abbey, which escaped destruction, are now in the Bibliothèque Nationale at Paris.

The later portion of the palace, which was built by the Abbot Jacques d'Amboise towards the beginning of the sixteenth century, is now the Hôtel de Ville. In front of it lies the old garden of the abbots, full of a quaint grace all its own, as, supported by buttressed walls, it dominates the houses which at present surround it.

The interesting Hôtel de Cluny in Paris, so well known from containing the splendid collection of Mediæval antiquities

originally founded by M. de Sommerard, was the town residence of the abbots.

The extensive gardens of the abbey are now the garden and pleasure-ground of the Ecole Normale. Only inconsiderable remnants exist of the wall by which the monastic precincts were formerly encircled.

In old days the town of Cluny was fortified, but the walls have been demolished. Four of the towers and three of the gates still, however, exist.

The parish church of Notre-Dame was originally founded by St. Hugues at the end of the eleventh century, but it was rebuilt (with the exception of the tower) towards the end of the thirteenth century. It is a good example of the Gothic style of the period. The church of St. Marcel dates from 1159, and is a Romanesque basilica with a semicircular apse and a fine octagonal tower.

To the student of early domestic architecture Cluny affords a rich feast, for though a number of the old houses in the town have been destroyed, there are still standing at least half a dozen edifices dating from the twelfth century, while a similar number are of the thirteenth. One of the twelfth-century houses is described by M. Viollet-le-Duc in his *Dictionnaire* under the title "Maison." As, however, no beneficent Police Act has compelled the inscribing of the names of streets either at the corners or anywhere else, it is a matter of considerable difficulty to discover some of the old mansions.

I think I have said enough to show that no one will regret a day spent in Cluny, but I may add that in the excursion can be combined a visit to the Château de St.-Point, the favourite residence of Lamartine, which is only some eight miles distant. The château, while not specially notable from an architectural point of view, is interesting from its associations with the poet and from the number of relics of him it contains. He lies buried in a little churchyard close at hand.

KING'S LANGLEY.*

LANGLEY (the long pasture) is a name which is found in various counties. Two other Langleys, which were royal manors, are Langley Marish in Bucks, and Langley Whichwood Forest in Oxon. The long lea or meadow land here lies on both sides of the river Gade (now the Grand Junction Canal), extending from Two Waters at the north to Hunton Bridge at the south (about four miles). Here we are in Chiltern Langley, so called, it is supposed, because the highlands on this side the river may be considered an extension of the range of the Chilterns. The designation distinguishes it from Lees Langley, which was the land of the abbots of St. Albans (now called Abbot's Langley).

At the time of the Conquest Chiltern Langley belonged to Earl Leofwin (or Lewin), who fell at Hastings fighting like a lion over the body of his brother, King Harold. His estates were confiscated and bestowed on Robert Earl of Mortaigne, half-brother of the Conqueror, who held about 800 manors in England, Berkhamstead being one of them. His son William, Earl of Cornwall, forfeited his estates to Henry I. by rebellion in 1104; this manor then came into the king's hands; it continued to be a royal manor till 1630. Here we are concerned with the royal residence, usually called the Palace; its origin is obscure, and its history is mixed up with that of the priory, in connection with which it first comes to light. For the few notes which I have to give I am mainly indebted to the county historians and to an able paper read by Sir John Evans in 1878.

The highlands here in the early times were well wooded; at the Domesday Survey there were oaks and beeches sufficient to supply "pannage" for 240 hogs. There was good hunting ground in the forest, which probably once extended from Berkhamstead almost to London. Some of the earlier kings probably found it convenient to lodge at the manor house occasionally after a day's hunting. Where the original manor house stood it seems difficult to determine. The present residence of the lady of the manor, Mrs. R. Blackwell, is on Chippenden Common. There is Langleybury in the south, towards Hunton Bridge; the Bury generally marks the seat of the Saxon lord. There is also an old manor house in the High Street (of the village) which the villagers call King John's house. Chauncy says a royal residence was first erected in Henry III.'s reign. When the king's house came into being it seems to have been a structure distinct from the manor house, because (as we shall see presently) the king gave the latter to the friars while he still retained a residence here. The first evidence of royal sojourn is a letter of Edward I. dated from Langley, April 17, 1286. He confirmed here the charter of the foundation of the college at Ashridge. In 1294 his son, Edward of Carnarvon, entertained a large company here for several months. The

Dunstable Chronicle tells us he required 200 dishes daily for his table, and his servants swept the provisions from all the markets in the neighbourhood as far as Dunstable, and were not at all careful to pay for them. In 1299 Edward I. and Queen Margaret entertained here the Abbot of St. Albans (John de Berkhamstede), the Bishop of Norwich, the Count of Savoy, and other distinguished persons, on All Saints' Day. We may note, by the way, that the parish church is dedicated to All Saints.

Edward II. clearly had a great attachment for Chiltern Langley. In the second year of his reign he founded in his park here a house of Dominicans, or friars' preachers, in fulfilment of a vow (as stated in his charter) which he had made when in peril of death. His first grant, dated December 20, 1308, assigns them a garden lying on the south side of the parish church, and 27 perches of land adjoining, on the west, for building. If the friars put up any building there, it was clearly only a temporary lodging, for the priory was certainly here on the hill. In 1312, March 28, he made a grant of 700 marks, to be paid to the friars in yearly instalments of 100*l.* by the Abbot of St. Albans (Hugh de Eversden) out of dues which he owed the king. This would be about 1,500*l.* a year for five years in present money. The condition was that masses should be said for the king and his ancestors. The monastic church seems to have been undertaken several years before this, for it was ready for consecration in 1312, when John Dalderby, Bishop of Lincoln, commissioned the Bishop of Bath and Wells (John Drokensford) to dedicate it. It may have been designated as "Christ Church," or "St. Saviour's," because the device on the conventual seal (an engraving of which is given by Mr. Cussans) is our Lord enthroned, in an attitude of benediction; below is a kneeling king holding a model of a church. It had not been long completed when the body of Edward's unworthy favourite, Piers de Gaveston, was removed from the Black Friars church at Oxford, where it had rested two years, and reinterred here January 3, 1315, with great pomp, in the presence of the king, the archbishop Walter Reynolds, and other prelates, the chief officers of the kingdom, and fifty knights. The chronicler, John de Trokelowe, speaks of the masses which the friars were required to offer for his soul.

There is little doubt that the church was a sumptuous building. I will here say a few words about it. We have just inspected, in Mr. Hughes's garden at Hill House, fragments of the fine clustered piers of this church, of Purbeck marble. They were brought there, as I am informed, from this field before us. Sir Gilbert Scott, who saw the foundations exposed in 1831, informs us that the plan was that of a conventual church of the first class. I am now referring to a letter which he wrote to our late local secretary, Mr. Ridgway Lloyd, December 2, 1876, and which was printed. Sir G. Scott states that he was then a youth, and coming to look at this building before us, commonly called "King John's Bakehouse," he found the occupier of the field engaged in digging up the foundations of the church. He saw "the greater part of the plan, including the bases of most of the pillars, nearly in a perfect state; these were of Purbeck marble. The bases of the ordinary pillars showed that they were groups of eight shafts round a central pier, those of the crossing being larger." He took a section of one of them. Mr. Henry Betts, of Ballspod Farm, to whom we are greatly indebted to-day, has been so kind as to inform me that the person referred to was his father. He made a plan of the excavations, which Mr. Betts has most obligingly lent me, and it is now exhibited. According to the information the foundations of the church (the north wall) were about 80 yards to the south of the south corner of this building before us. The site is identified by the position of two leaden coffins marked on the plan, found between two lines of wall-foundations lying east and west, extending 200 feet or more across the field. Between these walls you observe a vault marked in the plan (it is within the site of the nave). This possibly may have been the place of Gaveston's sepulture. He probably had a sumptuous monument. Encaustic tiles were found. Sir G. Scott also picked up fragments of stained glass. The church had a lady chapel, a south aisle, and a "revestiary" (vestry), because in 1557, according to a document quoted by Sir John Evans, the lead was taken off these structures to make a conduit pipe at Windsor.

To resume the history. In 1316 the king granted the manor house and adjoining closes to the friars, also the "vesture" (loppings or underwood) of Chipperfield Wood for their fuel. The buildings must have been of considerable extent, if there was accommodation for 100 friars, the number named in an Exchequer document. There seems to be a deficiency of evidence as to the resources of the priory. The founder probably lavished considerable sums upon it, besides those which have been mentioned, certainly on the church. The St. Albans chronicler intimates that the friars were maintained out of the king's treasury—"de fisco victuros" are his words. This may account for the fact that at his death the number was reduced to thirteen. In 1372 they acquired the

* A paper read by the Rev. H. Fowler at an excursion of the St. Albans Architectural and Archæological Society, and published in the *Herts Advertiser*.

rectory and great tithes by arrangement with the prioress of Dartford, in Kent, to whom Edward III. had granted them. In 1466 Prior Thomas Betts obtained from Edward IV. the Home Park, Chipperfield Wood, Friar's Wood, Friar's Meadow and toll of grain at the King's Mill, but even these grants seem hardly sufficient to account for the fact that at the dissolution this was found to be the richest house of Dominicans in England. Dugdale gives the annual value as 150*l.*; perhaps about 1,800*l.* in present money. I will now say that the site of the priory (stated to be seven acres) was acquired in 1630 by William Houlker, who had purchased the manor. From the information which Mr. Betts has given me the site is comprised within the field before us, and the adjoining field on the east. This property, sometimes called "Priory Fields," came at length by sale to the late Mr. Herbert Ingram, and now belongs to Sir Edward Watkin. Mr. Betts informs us that large quantities of flint foundations and wrought stone have been dug up within his memory in the southern part of the field; these probably belonged to the cloister and other monastic buildings. The eastern field now belongs to Mr. Groom. The plan of excavation shows that the eastern limb of the church extended into that field. I have omitted to mention that Mr. Betts has at his house a fine Purbeck base in good preservation.

To return to the palace. Records as to the date of its erection are wanting. It was located in the park, which in 1364 had been lately enclosed by palings. We learn from the survey of the first year of Elizabeth (1558) that this was about 4½ miles in circuit, being something like a square, and containing 667 acres. The north side extended from the river side (*i.e.* the river side of the park, as I understand it, which was in the high road to London), along a road as far as Whippenden Bottom. We are now very near this north boundary; a row of trees marks it here. The limit in the south was Bury Bushes, a mile southward from this spot, and Abbot's Gate. The east side skirted the highway to London. It was a deer park, and thickly planted with oaks and beeches. The site has come to the Earl of Essex by inheritance from Sir Charles Morrison, to whom it was granted by Charles II. in 1661. It has long been disparked and laid out in farms. The site of the king's house also went with the park. On the death of Edward II. his widow, Queen Isabella, had the manor, but she did not reside here. Edward III. was in residence here on several occasions, as evidenced by his letters. He reduced the friars' establishment, but bestowed on them several favours presenting some "mazer" cups, one of which was called "The Edward." The date 1341 brings us to the person who is most interesting to us at King's Langley (the place had now begun to be called by that name). On June 5 in that year Queen Philippa gave birth here to her fifth son, known as Edmund de Langley. He was baptised at the palace by Abbot Michael de Mentmore, the godfathers being the abbot and the Earls John de Warenne and Richard de Arundel. June 9 is the Feast of the Translation of St. Edmund; if the baptism was on that day, or near it, the king's son was perhaps named after the martyred king of East Anglia. The name had, however, been borne by other Plantagenet princes. Queen Philippa, after being churchered at King's Langley, visited the abbey and offered a cloth of gold. The king held a tournament in honour of the event. When Queen Philippa died in 1369 the king added to the staff of the friars' preachers twenty brethren at a stipend of 10 marks annually, who were to pray for her soul, and this seems to indicate a chantry in the Conventual Church. It has been ascertained from the Patent Rolls that the body of Edward of Angoulême, eldest child of the Black Prince, was buried here, having been brought from Gascony. I am indebted for these and other interesting particulars to the paper of Sir John Evans.

To speak now of the site of the palace. A survey was made of the thirty-third year of Elizabeth (1591) which is very difficult to understand. According to my reading of it, we have the following information:—The extent of the buildings and courts was three acres. The principal gatehouse was on the east. It would have stood, I suppose, on the road by which we have come here. One side of the site abutted on the eastern wall of the church (I think it means the churchyard) and on the wall of the cloister. There was a building called "Verney's Lodging." On the north side, near the park paling, was another gatehouse, abutting southward on an old building called the "Eight Bays." As I understand it, the site extended northward and eastward of the priory, and was in contact with the east wall of the cemetery of the Conventual Church. This may have coincided with the eastern fence of Mr. Groom's field. Further information may enable me to form a more definite opinion. The ruinous wall which we passed is supposed to be within the site, although of more modern date. Some foundations are close to the road. Mr. W. Page has kindly given me a note from a survey of 1556 (Augmentation Office). The sites of the park and king's house were then leased to John, Lord Russell. It states the outer "court of the site of the manor, parcel of the possessions of Jane, late Queen of England, contained divers tenements and chambers, also

stables and barns." Some of the buildings were then in a ruinous condition, and some had been pulled down. A document dated 1372 mentions the royal lodge named "Little London." This Sir John Evans considers to have stood in "a moated square near the river, where encaustic tiles have been dug up."

I must now speak of the building before us. It is about 72 feet long and 20 feet wide. Its flint walls are 3 feet thick. There is an upper storey or loft. We see this western side has the remains of massive buttresses; we infer it was an external wall. The opposite side also had buttresses, which have been cut off. The three pointed arches give an architectural character. The jambs appear to be sunk in the ground. The level of the floor of the interior is about 1 foot 9 inches below the outer level. The apex of the arches is now only about 6 feet above the ground. Mr. Betts has kindly made an investigation, which shows that the height was once 8 feet at least. The doorway at the north end is of similar character. It may be of the Decorated period. Other windows inserted to render the building habitable as a cottage are comparatively modern. We see the ruined wall southwards, which shows the original extent of the range of buildings. I conjecture this to be a Mediæval cattle stable connected with the priory. The cattle would enter by these arches or one of them. It is very near the site of the palace and still nearer to the priory. The traditional name, "King John's Bakehouse," seems inexplicable.

To return to Edmund de Langley. He, perhaps, was here much in his youthful days. It is certain that the king's house was assigned to him for a residence, and at some period he received a grant of the manor, which was to descend to his heirs. It did so descend, and at last became merged in the Crown in the person of his great-grandson, Edward IV. I will now follow out the descent. The manor, with the park and palace, were granted by Edward IV. to his mother, Cecilia, Duchess of York, for her life. She did not reside here, but at Berkhamstead. Under her Sir Ralph Verney was steward and keeper of the park, and the office seems to have been held by the same family for several generations; thus "Verney's Lodgings," in the Survey, is accounted for. The property afterwards became part of the dower of Cecily's granddaughter, Elizabeth of York, wife of Henry VII., and subsequently the dower of Henry VIII.'s queens, Anne Boleyn and Jane Seymour. We have already seen that the site of the park and palace was conveyed by Charles II. to Sir Charles Morrison in 1662. The manor had been sold in 1630 to Thomas Houlker, citizen of London. It is now possessed by Mrs. Blackwell.

Edmund de Langley is a well-known figure in history. I have only to mention a few facts connecting him with this locality, which we may call his home. In 1372, on his return from Gascony, he married Isabella, of Castille, daughter of Pedro, King of Spain. John of Gaunt married her elder sister, Constantia. Isabella accompanied Edmund, then Earl of Cambridge, during his two years' campaign in Portugal. She appears to have been a devoted wife, although the St. Albans chronicler represents her as "worldly and trivial," but she was not a benefactress to the abbey. Edmund was created Duke of York in 1385. In 1392 King Richard II. and his queen, Anne of Bohemia, kept Christmas at Langley in the company of four bishops and various members of the court. Edmund and his duchess were present. Isabella's death occurred two years later (in 1394), probably in the palace here. She had been married twenty-two years, and was the mother of Edmund's children, Edward Earl of Rutland, Richard, afterwards Earl of Cambridge, and Constance. Richard's queen died the same year, June 7; also Constantia, Duchess of Lancaster. Isabella was certainly buried in the Priory Church. In 1396 Duke Edmund kept Christmas here in company with his brother, the Duke of Lancaster, and the king. He was then married to Joan Holland. John of Gaunt died February 3, 1399. Six months later, at the time of Bolingbroke's invasion, Duke Edmund was in charge of the kingdom as regent. The course of events compelled him to resign his office. When Henry mounted the throne his uncle Edmund, it would appear, retired into private life at Langley. We cannot say whether he was here when the corpse of King Richard was brought for interment in February 1401. The account of the St. Albans chronicler (William Wyntershyll, says Mr. Riley) seems to imply his absence. The body was brought from Pontefract (where it was commonly supposed King Richard died from the effects of voluntary abstinence from food), resting one night at St. Albans, lay in state in St. Paul's Cathedral—the face of the corpse was exposed to view from the lower part of the forehead to the throat—thence, says the chronicler, was conveyed in a funeral car attended by four knights to Langley (according to Froissart), and buried by night in the church of the friars' preachers, without any regal pomp, by the Abbot of St. Albans (John Moote), the Bishop of Chester, and William, Abbot of Waltham. No one offered hospitality to the few mourners. We know that his remains were removed to the tomb in Westminster Abbey in 1415 by

Henry V., who also founded a chantry for him at Shene. In relating the interment of Isabella of Castille in the church of the friars the chronicler adds, "where, they say, are buried the bodies of many traitors." We may infer that the monks of St. Albans had no liking for these Dominicans. Edmund de Langley had made his will a few months before King Richard's death (November 25, 1400). He directed that his body should lie at Langley close to his much-loved late consort, Isabella—"pres de ma trèsamé Isabele jady's ma compaigne." He died August 1, 1402, aged sixty-one, and was buried according to his wishes in the Conventual Church, close beside the body of Isabella; the chronicler says his body was brought to Langley and his funeral was an unostentatious one. He had given no directions about his tomb, we infer, for the good reason that it had already been erected, and his wife's remains deposited therein. Two chantry priests were appointed by his will. The tomb was probably removed to the parish church not later than 1572, for in that year Queen Elizabeth granted the monastic site to Edward Grimston, who is stated to have demolished the church and other buildings. The absence of all record is very remarkable.

BUILDING STONE.*

THE qualities necessary to the best possible building stone are workability, durability and beauty. It must also be cheap. Workability includes in its meaning accessibility, a ready yielding to quarrying operations, the absence of refractory qualities under the hammer and chisel, and a texture and grain that will hold decorative finish. Stone that cannot be quarried readily has the disadvantage of great cost to begin with. If the "raw material" is expensive, the finished product must be costly. On the other hand, if Nature has so deposited her stores that the stone is easily taken from the quarry, still, if the material is refractory in the final cutting and finishing, no matter what may be its other qualities, it cannot be a very cheap material for the builder, as it will demand an over amount of expense and delay in preparation. Still less will it be desirable if it obstinately refuses to hold finish or decoration. Stone that comes from the quarry soft and yet somewhat tough, but hardening after a time, has the finest quality of workability. This renders it easy to quarry, very responsive to the tools of the cutter, and capable of taking easily and holding permanently the finish and decorative designs of the architect's specifications. It must be kept in mind, however, in examining stone, that if it comes from the quarry wet, and for that reason easily workable, it may again take up water after drying, which would be most objectionable; but if in the process of drying in the first place it passes through a chemical change which will render it ever afterward impervious to water, the quality is just what could be wished for in this regard. Usually an examination of the outcropping surfaces of the stone in place will give a safe knowledge of its value as regards workability. Next, after the character of the stone regard must be had touching the conditions of its deposit. Too much overlying matter, whether stone or earth, will usually make the quarry work very heavy and expensive. This overlying matter, technically called "stripping," is, as a rule, quite worthless, and must be entirely removed before the stone can be worked with steam channelers or other quarrying appliances, hence the necessity of a careful examination to determine its nature and extent in each case before opening a quarry.

Durability, as applied to building stone, includes every quality tending to make the material lasting and unchangeable after it is laid in a structure. These qualities are many, and often seemingly conflicting in their nature. Hardness, elasticity, tensile strength, power to resist the greatest crushing force, imperviousness to water, and invulnerability to the attacks of air and its corrosive and disintegrative burdens, are some of the qualities, but not all. Evenness and homogeneity of composition, unity of substance, so to speak, and the power to resist extremes of heat and cold, are quite as necessary. It will be seen at once that chemical analysis must be relied on to insure the best knowledge of some of these requirements. Some otherwise good and durable limestones will become corroded and discoloured, and have their integrity destroyed by the effect of sulphurous smoke from the burning of impure coals; others will be injuriously affected by the action of rain-water, and still others by the oxidising power of the air. Some sandstones bear too much iron in their composition; others lack sufficient cohesion of the particles, whilst others yet are clayey or unequal in grain or texture. Every test of practical science should be given to stone before it is used in any building intended to be a permanent structure. As a rule, if the outcropping ledges are found to be infiltrated with water, which makes the outer surface constantly damp, the stone will not be good, for this would indicate that it would take up too much

moisture in the wall. Still, it is often the case that an apparently over-hydrous stone will dry out permanently after it is quarried and cut. Many of the sandstones, notably the better qualities of conglomerate, are of this character, and so soft when first taken out that they may be cut to any rough shape with a common axe or hatchet, but hardening after a few days' exposure so that water will not affect them.

The elasticity of stone may be tested by sawing it into long, slender strips, say 2 inches square and 3 feet long, when, if it be quite perceptibly flexible, its elasticity is good. If such a bar be suspended so as to hang free by a string and is struck a light blow with a hammer, its evenness and solidity of fibre will be attested by a clear, sweet, metallic note, not unlike that of a fine bell or that of a well-tempered steel bar. As a rule the best stone will break with a direct line of fracture, but it may be conchoidal or otherwise indirect and still be unobjectionable. Parallel lines of cleavage or of stratification are always favourable indications where other features are promising.

Resistance to crushing weight may be pretty safely inferred from solidity of texture and evenness of grain, but it is always necessary before a final acceptance to submit the material to the severest tests of an apparatus for that purpose.

In examining sandstone with a view to building purposes, the outcropping, if there be any, should be carefully scanned with a view to discovering what effect long exposure to the atmosphere and the rigours of winter may have had upon it. If the stone has "weathered" badly this will be shown by one or another sign of disintegration or demolition, and a talus of fragments and sand will be found formed at or near the base of the outcropping cliff. Often the substance of the rock will show unmistakable evidence of inequalities of structural composition, such as horizontal cavities caused by the weathering out of seams or streaks that, on account of bearing too much iron, have oxidised and crumbled away. Such stone if used in a building would prove worthless, and therefore dangerous. It is often the case, as I have observed during a long experience in civil engineering, that public bridges erected by counties are rendered unsafe by having their piers and abutments constructed of this kind of stone, and that, too, in places where most excellent material lay near at hand, and which a little knowledge of the nature of stone would have pointed out to the superintendent. Too frequently it happens that appearances of the most untrustworthy kind are relied upon where an ignorant person is set to do work which ought to be in charge of a skilled and well-informed engineer.

In judging of the probable durability of limestone, before subjecting it to any test of science, the same observations should be made as in the case of sandstone, with a view to ascertaining its weathering qualities. Any unequal discolouration of the face of the exposed ledge should be scrutinised carefully. Usually these are caused by the presence of iron in the composition of the rock. But limestones are much more injuriously affected by hidden faults of composition than are sandstones, and for this reason they demand a much more careful examination before any extensive quarries are opened. It is often the case that iron in limestone will do no more than discolour the outer surface on exposure to the action of air and rain-water; but even this is a serious defect when the stone is to be used in any structure wherein beauty is a chief object. For the rough masonry of ordinary bridges, and for the hidden foundations of buildings, a cheap and durable stone is what is most wanted, and in these discolouration is not a fatal fault.

Beauty, when applied to any building material, includes all the good qualities already enumerated, with the added value of a pleasing colour or combination of colours, and a general effectiveness of appearance when the structure in which it is used has been completed. The variegated granites undoubtedly are the most beautiful of all building materials. Next to granite the red and brown sandstones are most pleasing to the eye, but the white, grey and blue limestones are very effective, and they have the advantage over granite in that they work much more easily in ornamentation, while they take figures in relief with far more clearness of outline than do the sandstones as a rule. Architects have long since discovered the pleasing effects to be produced by using different kinds of stones in the same building, placing each where its particular qualities will best serve the general motive of the design.

As a rule, all else being equal, the stone which holds its native colour best will be most beautiful in a building, and of the stones which change colour, that will be most desirable which changes least and evenly. Some of the grey sandstones, however, change colour unevenly and give a striking and oft-times picturesque cloudiness to the surface, which adds to its effectiveness of colour in a wall. The nearly white limestones that take on by exposure a dark cream-brown hue if they do not contain too much magnesia, hold that tint very well and are quite beautiful. As a rule the presence of many large animal remains in a stone is objectionable on account of the tendency of such a composition to crumble; but where fossiliferous rock is durable it will usually be found very beautiful when cut, the organic remains bossing it over with

* By Maurice Thompson in the *Indiana Geological Report*.

variegations that greatly heighten its appearance. Stone which contains large fossils is not, however, the best for receiving raised ornamentations, such as figures in relief, no matter how durable and beautiful it may be, for the animal form will interfere with nicety of cutting and polish as well as with the regularity of the figures. Fossils will usually be found harder than the matrix in which they are set, but this is not always the case, for quite often the form is that of a hollow cast or impress filled in with material which crumbles easily. As a rule fossils, though very hard, are but loosely set in sandstone, and often they are very large and rough forms of plants extremely silicious and refractory. Blocks containing these are to be avoided as probably worthless for building purposes, however valuable and interesting they may be from a scientific point of view.

Many very beautiful stones that are not durable when exposed to the weather are very valuable for the inside finishing of buildings, where they will last for ages, holding the finest tints of their colouring without perceptible change.

From what has been said above it will be seen that every owner of stone beds should, before going to the expense of opening quarries, have his rock beds examined by an expert, whose report should show all the defects as well as all the good qualities of the material. Usually this can be done without any great outlay of labour or money, for the experienced geologist or engineer can quickly discover from the stone and its surroundings the nature of the deposit, and very simple chemical and mechanical tests will settle the question of strength and durability. There are beds of magnificent building stone lying undeveloped in many places, simply for the reason that the owners are not aware of the treasure they possess. In other places quarries are being industriously worked and the stone used in the erection of costly buildings, where in fact the material is wholly unfit for use on account of its lack of durability. I have examined many extensive structures whose stone was fast crumbling away. True, a few years will not show much decay, but in the long future the result will certainly be disastrous. The constant action of the atmosphere, the expansion and contraction consequent upon extremes of heat and cold, and the disintegrating effect of rain-water slowly but surely tell upon the integrity of the exposed parts.

THE TEMPLES AT KARNAK.

THE new director of the National Gallery has not lost his interest in Egyptian remains. The following appeal for funds has been sent out by Mr. Poynter, and deserves to obtain an immediate and liberal response:—

The great and continually growing interest which is being taken in the scheme for the proposed reservoir below the Island of Philæ on the Nile has for a time thrown into the background the object which the Society for the Preservation of the Monuments of Ancient Egypt has had in view from its first foundation. I refer to the preservation of the great temples of Karnak from further degradation caused by the crystallisation of the salts contained in the soil, which eats away the bases of the columns and walls. This destructive agent is set in action by the annual inundations of the Nile; the salts in solution penetrate the porous surface of the sandstone, and, as they crystallise in drying after the waters have retired, break off minute fragments of the stone. The result of this process repeated annually through many centuries may be seen in any photograph of the ruins; the columns, instead of resting on a broad base, have but a narrow neck for their support; this finally fails them and the column falls. Eleven out of the twelve gigantic columns which formed the avenue of approach to the Great Hall have thus given way, and the same fate awaits, no doubt, all those within reach of the inundating waters.

After consultation with Sir Colin Scott-Moncrieff, Colonel Ross, and other engineers of the Public Works Department in Cairo, our committee decided to adopt a scheme, prepared by Major Brown, R.E., of the Irrigation Department, for pumping the Nile water out of the area of the ruins, and so preventing the cause of mischief by keeping the ruins dry. The final and definite scheme consists of a steam pump and engine-house with a well, and an 18-inch pipe drain to carry the inundation water back to the Nile as fast as it enters the ruins; and by the terms of the agreement entered into by M. de Morgan, the distinguished director of the Ghizeh Museum (the assent of the Egyptian Government to our general proposal was given as far back as 1890), this society is to pay the expenses of the erection of the pump and engine-house and other works, and to provide for the working of the engine for two years; the whole to be then handed over to the Egyptian Government, who undertake to provide for the cost of continuing the work after that period—that is, the permanent working of the engine to keep down the water. In all this M. de Morgan has shown himself most favourable to our plans, and it is due to the facilities which he has given to Major Brown that we are in a position to carry out the work.

After much consultation and revision of the estimates, the cost of engineering has been brought down to 1,300*l.*, in addition to which sum 200*l.* a year will be required for two years to keep the engine going.

During the past season Major Brown has been actively at work in the intervals of leisure which he can afford from his official duties as irrigation officer of the district, and the engine-house and pump, the cost of which he estimated at 587*l.*, are by this time nearly, if not quite, completed, and he will require shortly the greater part of the sum which the society has in hand to defray their cost. Annual subscriptions promised amount to about 120*l.*, and the society has in hand from this source and from donations a sum amounting to over 700*l.*; we are therefore in want of 600*l.* more to carry out the whole work and hand it over complete to the Egyptian Government, besides which we ought to have further annual subscriptions to the amount of nearly 100*l.* a year for two years to defray the annual requirements of the engine for that time. The committee therefore make an appeal to those who are interested in the preservation of this, the most magnificent group of ruins in the world, for the funds necessary for our purpose.

Some years ago M. Marietta was reported to have said that nothing could be done for Karnak but abandon it to its inevitable fate. It is to the French engineer, Grand Bey, that the first idea of arresting the action of the *sebak* on the bases of the columns is due; when that is once stopped there seems no reason why what now remains of this Titanic structure should not stand firm for a period which, compared with the brief duration of human life, may be called eternity; nothing short of an earthquake or of intentional violence can dislodge its massive parts. There must be thousands who have visited Karnak from our own country and from America who would gladly contribute to so great a work, to be carried out at a cost comparatively so trifling, if you, sir, will allow it to be brought before them in your paper, at once so influential and so widely circulated.

Donations and subscriptions may be sent either to me or to Mr. F. G. Hilton Price, 17 Collingham Gardens, S.W., who is hon. treasurer to our special fund; and I am prepared to send our report containing details of Major Brown's scheme to any one who desires further information.

The committee are the more emboldened to ask for money because, in view of the uncertainty and delay (arising from various unavoidable causes) which have until this year attended our efforts, they have for the past two years made no call on annual subscribers for their promised assistance.

GENERAL.

The Tower Bridge will be opened to-morrow by the Prince and Princess of Wales. The *Architect* was privileged to announce the scheme to the public and to publish the original drawings of it, which were prepared by Sir Horace Jones, in order to obtain support for the project. From time to time we have followed the progress of the structure in these columns, and next week it will be our pleasing duty to describe it in its complete state.

A loan collection of pictures in water-colour and black and white, got together by Mr. W. Hughes, was opened on Monday in the Wolverhampton Art Gallery.

At the general meeting of the Royal Archaeological Institute on Wednesday, the 4th prox., papers will be read on "The Tomb of St. Hugh at Lincoln," by Mr. F. J. Willson; "The Devastation of Nubia," by Mr. Somers Clarke, F.S.A.; and on "Roman Antiquities in Carinthia," by Professor B. Lewis, M.A., F.S.A.

The Brussels International Exhibition, is postponed until the year 1897, in order that sufficient time be allowed for the construction of the buildings, which will be on a great scale.

Sir Frederic Leighton, P.R.A., has received the degree of D.C.L. from the Durham University.

Mr. J. Jackson, architect, Bradford, has designed plans of interlocking houses to supplant back-to-back houses in an economical and convenient method.

The Trustees of the National Gallery have purchased from the Earl of Northbrook *The Agony in the Garden*, by Andrea Mantegna; *St. Jerome in his Study*, by Antonello da Messina; and *The Legend of St. Giles and the Hind*, by an unknown master of the Flemish school.

Barnard's Inn has been converted into a new school for boys for the Mercers' Company. The fine old hall has, however, been preserved, and will be utilised as a dining-room for the scholars.

The Undercroft in Laurence Pountney Hill, the sole remaining undercroft in the City, it appears, is to be demolished, in spite of all the efforts to rescue so interesting an example of Mediæval art. The property belonged to the Merchant Taylors' Company, who recently sold it to the City of London Property Company.

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COMPETITIONS OPEN.

EAST GRINSTEAD.—Jan. 31.—Designs are invited for an Isolation Hospital. Premium £5 5s. Mr. W. Alsten Head, Clerk to the Union Sanitary Authority.

HULL.—Designs and Plans are invited for Proposed Branch Public Library. No Premiums offered. Mr. R. Hill Dawe, Town Clerk.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb. 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

RUNCORN.—Jan. 19.—For Water Supply Schemes. Premium of 5l. Mr. John Ashton, 71 High Street, Runcorn.

SOUTHEND-ON-SEA.—Jan. 31.—For Designs for Shelters, Sea-baths, Photographic Studio and Shops. Mr. W. Gregson, Town Clerk, Southend.

CONTRACTS OPEN.

ABERDARE.—Jan. 8.—For Building Twelve Houses. Mr. C. H. Elford, Architect, Canon Street, Aberdeen.

BARNSTABLE.—Jan. 13.—For Building Parish Rooms in Connection with Church of SS. Peter and Paul. Mr. W. C. Oliver, Architect, Bridge End, Barnstable.

BARRY.—Jan. 17.—For Building Presbyterian Chapel. Mr. T. G. Williams, Architect, 3 Cable Street, Liverpool.

BATH.—Jan. 10.—For Rebuilding Premises, corner of Cheap Street and High Street. Mr. C. E. Davis, F.S.A., Architect, Bath.

BLACKBURN.—Jan. 29.—For Building Pauper Lunatic Asylum. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BRADWORTHY.—Jan. 10.—For Converting Building into Two Dwelling-houses. Mr. A. Tribble, Hotel, Bradworthy, Devon.

BRENTWOOD.—For Pulling-down and Erecting a New Inn and Shop Premises. Mr. A. T. G. Woods, Architect, New Road, Brentwood.

CALDER ABBEY.—Jan. 6.—For Building Two Cottages. Messrs. Pickering & Crompton, Architects, Whitehaven.

CARDIFF.—For Corrugated Iron Shedding at New Depot, Cathays, for the Cardiff General Omnibus Company, Limited. Mr. W. J. Grylls, Architect, 37 St. Mary Street, Cardiff.

CARISBROOKE.—Jan. 29.—For Building Boundary Walls for Extension of Cemetery. Mr. W. C. Way, Surveyor, Newport, Isle of Wight.

CHELMSFORD.—Jan. 16.—For Building Dwelling-house. Mr. Fred Chancellor, Architect, Chelmsford.

CLEATOR MOOR.—Jan. 6.—For Building Library, Offices and Stores. Mr. Henry Rothery, Public Offices, Cleator Moor.

CONNOR.—Jan. 5.—For Building Church. Rev. Dr. Colvin, The Manse, Connor, Ireland.

CORK.—Jan. 16.—For Building Catholic Church. Mr. G. C. Ashlin, Architect, 3 Lower Merion Street, Dublin.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

FELIXSTOWE.—Jan. 19.—For Building Five Dwelling-houses for the Coastguard. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

GAINSBOROUGH.—Jan. 10.—For Works in connection with Water Supply, Sinking and Lining Well, &c., and Supplying Engine and Pumping Machinery. Mr. Jabez Church, Engineer, 55 Parliament Street, Westminster.

GATESHEAD.—Jan. 11.—For Building Mortuary. Mr. J. Bower, Borough Surveyor, Town Hall, Gateshead.

GREAT STAMBRIDGE.—Jan. 6.—For Additions, &c. to Board Schools. Mr. Edward Wright, Architect, High Street, Southend-on-Sea.

GREAT WESTERN RAILWAY.—Jan. 9.—For Building Four Cottages, Evershot Station, Dorsetshire. Mr. G. K. Mills, Secretary, Paddington Station.

HANDSWORTH.—Jan. 8.—For Building Board School. Mr. Thomas H. Moon, Clerk, School Board Offices, Handsworth.

HARROGATE.—Jan. 8.—For Building Pair of Villas. Messrs. Milnes & France, Architects, 99 Swan Arcade, Bradford.

HUDDERSFIELD.—Jan. 10.—For Works in Conversion of College into Higher Grade Board School. Mr. Ben Stocks, Architect, 7 Union Bank Yard, New Street, Huddersfield.

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MABLETHORPE.—Jan. 10.—For Building Rectory. Rev. D. R. Whitelaw, Rector, Mabelthorpe.

NEWPORT, ISLE OF WIGHT.—Jan. 23.—For Building an Asylum at Whitecroft. Mr. B. S. Jacobs, Architect, 88 Bishopsgate Street Within, E.C., and Hull.

OVENDEN.—Jan. 10.—For Building Stabling, Coachhouse, &c. Messrs. Jonas Drake & Son, Ovenden, Halifax.

PARLIAMENT HILL.—Jan. 16.—For Building Refreshment Room. The Architect's Department, County Council Offices, 13 Spring Gardens, S.W.

PONTYPRIDD.—Jan. 20.—For Constructing Brick Gas-holder Tank. Mr. Thomas Newbigging, Engineer, 5 Norfolk Street, Manchester.

POPLAR.—Jan. 10.—For Building Casual Wards at Bromley, Middlesex, for the Guardians. Messrs. W. A. Hills & Son, Architects, 149 Bow Road, E.

PORTSMOUTH.—Jan. 30.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

RHYL.—Jan. 5.—For Construction of Sewerage Works and Disposal of Sewage. Mr. Arthur Rowlands, Town Hall, Rhyll.

SOUTHPORT.—Jan. 16.—For Construction of Five Slaughterhouses and Five Lairs at Blowick. The Borough Surveyor.

STEVENTON.—Jan. 24.—For Building School and Teacher's Residence. Mr. J. Gibson, Architect, New Street, Basingstoke.

SWINDON.—Jan. 12.—For Building Primitive Methodist Sunday School. Rev. J. E. Leuty, 28 Commercial Road, Swindon.

WEST HAM.—Jan. 8.—For Building Board Schools, Stratford. Messrs. J. T. Newman & Jacques, Architects, 2 Fenchurch Court, E.C.

WALSALL.—Jan. 16.—For Alterations to Board School. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WOOLWICH.—Jan. 9.—For Erecting Engine and Pump-room, Lower Market Street. Mr. H. H. Church, Architect, William Street, Woolwich.

TENDERS.

ABERDEEN.

For the Erection of Broomhill Public School, for the Aberdeen School Board. Mr. ALEXANDER MAVOR, Architect, Union Street, Aberdeen. Quantities by the Architect.

Mason Work.

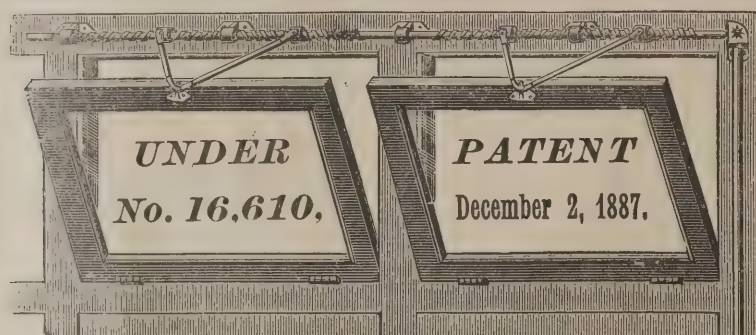
P. Bisset & Son, Willowdale Place . . .	£6,600	0	0
Robert Smith, 1 Canal Road . . .	5,856	0	0
Alex. Milne & Son, Bonnymuir Place . . .	5,847	0	0
Greig & Craib, Broomhill Place . . .	5,757	0	0
John Morgan, Charlotte Street . . .	5,750	0	0
Edgar Gould, Gilcomston Park . . .	5,650	0	0
Pringle & Slessor, 7 Thistle Lane . . .	5,630	0	0
Robert Buchan, 136 Great Western Road . . .	5,600	0	0
James Gould, Gilcomston Park . . .	5,572	0	0
Wm. Farquharson, Fraser Road . . .	5,568	0	0
Charles Gordon, 82 Powis Place . . .	5,553	14	0
George Fordyce & Co., Fraser Road . . .	5,450	0	0
Henderson & Russell, 156 King Street . . .	5,397	16	7
Ogg & Sons, Stoneywood . . .	5,225	0	0
Thomas Grant, 33A Rosemount Place . . .	5,030	0	0
GALL & WALKER, Richmond Street (accepted)	4,971	0	0

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John Henderson, 19 Summer Street . . .	3,050	0	0
Alex. Hall, Mile End . . .	2,998	10	0
Wm. Dawson, 136A Skene Street . . .	2,984	0	0
James Forbes, Bridge of Dee . . .	2,837	0	0
Watt & Clark, Princes Street . . .	2,796	10	0
James Farquhar, 20 Broomhill Place . . .	2,785	0	0
McRobbie & Milne, Albert Place . . .	2,666	0	0
Simpson & Walker, Union Wynd . . .	2,600	0	0
James Garvie & Sons, 55 Rose Street . . .	2,598	0	0
Watson & Robb, Spring Garden . . .	2,597	0	0
HENDRY & KEITH, Gilcomston Park (accepted)	2,470	0	0

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George Farquhar, Don Street, Woodside	174	0	0
Wm. Coutts, 16 Chattan Place	172	0	0
G. Currie, 31 Gilcomston Park	171	4	4
Wm. W. Milne, 80 Crown Street	170	0	0
Alex. Adam & Co., 4 Hutcheon Street	168	17	0
George Davidson, jun., Thistle Street	165	0	0
ALEX. LAW, Little Chapel Street (accepted)	150	0	0

Plumber Work.

A. B. Robertson, 158 Skene Street West.	706	0	0
John Campbell, 13½ Dee Street	702	0	0
John T. Anderson, Bath Street	699	18	6
James Munro, 96 Holburn Street	699	9	0
Thom & Strachan, Windmill Brae	697	14	0
JOHN BLACKIE & SONS, Littlejohn Street (accepted)	658	10	0
Walter Simpson, 29 Thistle Street (withdrawn)	619	0	0

Plasterer Work.

James Bannochie & Sons, Gilcomston Park	1,016	1	9
John Kirk & Co., Henry Place	702	10	0
Scott & Sellar, Charlotte Street	679	0	0
Roger & Baxter, 28 Summer Street	643	0	0
JAMES STEPHEN & SONS, Summer Street (accepted)	572	0	0

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James McLeod, 45 Upper Kirkgate	561	12	0
B. Main, 29A St. Andrew Street	550	0	0
Mason & Son, 38 Queen Street	547	0	0
Wm. Slaker & Sons, 6 Bath Street	546	3	0
James Garvie & Sons, 236 Union Street	539	0	0
J. & S. Fyfe, 5 Dee Street	524	15	0
Adam Buchan, 15 Rosemount Place	519	0	0
Alex. Ferguson & Co., 476 Union Street	517	0	0
John Whyte, 465 Union Street	500	0	0
GEO. DONALD & SONS, 18 Nether Kirkgate (accepted)	498	0	0
David Simpson, 66 Esslemont Avenue	492	0	0
J. M. Fenton, 16A Skene Street West	491	7	0

BALTINGLASS.

For Building School and Teacher's Residence, Baltinglass.

J. Good, Dublin	£800	0	0
E. Boulger, Finahely	735	0	0
P. Kehoe, Knockavagh	700	0	0
J. FINN, Baltinglass (accepted)	680	0	0
J. Finn (extras per contract)	70	0	0
J. Taylor, Brannoxtown	678	10	0

BRISTOL.

For Construction of Sewers, for St. George's Urban Sanitary Authority. Mr. T. L. LEWIS, Surveyor.

Mitchell & Thompson, Bristol	£4,713	0	10
Lloyd & Powell, Bristol	2,756	15	0
F. Martin, St. George	2,738	6	0
Thomas & Webb, St. George	2,032	16	6
G. Jones, St. George	2,021	5	3

CARDIFF.

For Iron Rails for Ely Common and Grangetown Open Spaces, for the Cardiff Town Council.

Ely Common.

D. Rowell, London	£1,730	0	0
F. Morton & Co., Garston	1,594	0	0
Blackmore & Co., Cardiff	1,384	0	0
W. A. Baker & Co., Newport	1,225	0	0
Heywood, Wolverhampton	1,191	0	0
HILL & SMITH, Brierley Hill (accepted)	1,124	0	0
G. Kyte & Co., Cardiff	952	0	0

Grangetown.

D. Rowell	656	0	0
F. Morton & Co.	572	0	0
Blackmore & Co.	512	0	0
W. A. Baker & Co.	453	0	0
Heywood	448	0	0
Hill & Smith	426	0	0
G. KYTE & Co. (accepted)	349	0	0

COLCHESTER.

For Underpinning to River Wall at the White Horse Inn, East Street, Colchester, for Mr. Chas. Armstrong, Manager and Receiver to the Colchester Brewery Co., Limited. Mr. J. W. START, F.S.I., Civil Engineer, Cups Chambers, Colchester.

Ripper Bros., Castle Hedingham	£540	0	0
H. Everett & Son, Colchester	355	0	0
J. HARDEN, Colchester (accepted)	288	15	0

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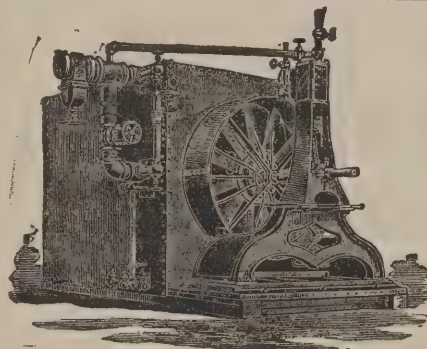
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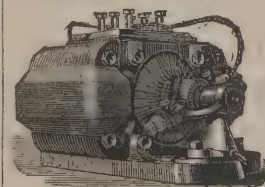
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EXMOUTH.

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W. H. Perry	£1,450	0	0
F. Grace	1,390	0	0
A. Hayman	1,367	0	0
H. H. HOOPER, Exmouth (accepted)	1,200	0	0

GORTON.

For Constructing Outfall Works, &c., for the Goole Local Board.

D. Edie	£14,000	0	0
G. Clarke	3,700	0	0

IPSWICH.

For Construction of Engine-room, Back Street, St. Clement's, for the Ipswich Town Council.

PARKINGTON & SON (accepted)	£186	0	0
-----------------------------	------	---	---

KILWINNING.

For Building Enclosure Walls, Levelling Grounds, Formation of Walks, Drainage, &c., in Connection with the Extension of Kilwinning Cemetery.

A. Beattie, New Cumnock	£826	5	0
J. Armour & Son, Irvine	790	0	0
J. Young, West Doura, Kilwinning	699	0	0
W. BROWN, Stevenson (accepted)	542	13	0

KIRKANDREWS-ON-ESK.

For Stone Bridge over the River Sark at Corries Mill Ford, in the Parish of Kirkandrews-on-Esk, Cumberland, and Half Morton, Dumfriesshire. Mr. G. J. BELL, County Surveyor, Carlisle.

Tilfer, Langholm, Dumfriesshire	£580	0	0
J. & H. Murray, Alstonby, Carlisle	576	0	0
McILDOWIE, Annan, Dumfriesshire (accepted)	561	0	0

LUDGVAN.

For Masonry for Alterations to Whitecross School, for the Ludgvan School Board.

W. J. Roach, Lelant	£130	0	0
W. J. Sammens, Ludgvan	125	0	0
J. Dastow & Son, Penzance (accepted)	110	0	0
P. Hurrell, Lelant	95	0	0

LONDON.

For Sanitary Work at Alpha Buildings, Walworth. Messrs. JOHN TAYLOR, SONS & SANTO CRIMP, Engineers.

T. HEATH (accepted)	£315	0	0
---------------------	------	---	---

For Making-up and Paving the Passage between William Street and Lisgar Street, Fulham, for the Fulham Vestry. Mr. W. SYKES, New Streets Surveyor, Town Hall, Walham Green.

Nowell & Robson, Kensington	£189	0	0
G. Wimpey & Co., Hammersmith	125	0	0
E. Parry, Walham Green	124	0	0
Imperial Stone Co., East Greenwich (accepted)	107	0	0

NEWCASTLE-ON-TYNE.

For Building the Burt Hall and Offices, Newcastle-on-Tyne, for the Northumberland Miners' Association. Mr. J. W. DYSON, M.S.A., Architect, Newcastle. Quantities by Architect.

W. C. Tyrie, Gateshead	£6,552	2	0
J. & W. Lowry, Newcastle	6,376	14	0
Middlemiss Bros., Newcastle	6,271	18	0
T. Weatheritt, Newcastle	6,071	3	7
John Fergusson, Newcastle	5,612	0	0
S. B. BARTON, Newcastle (accepted)	5,422	16	8

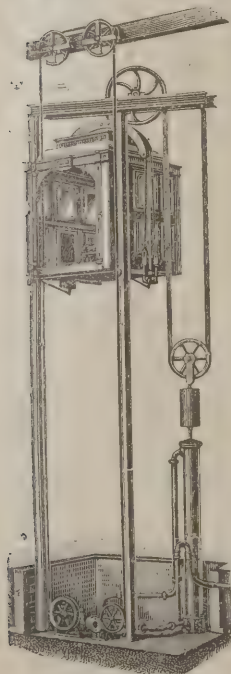
Plumbing.

A. Scott, Newcastle	535	4	5
J. F. Hobson, Newcastle	532	16	7
Threlkeld & Wallace, Newcastle	532	11	9
H. Walker & Son, Limited, Newcastle	475	17	2
M. Gibson, Newcastle	474	5	6
STEPHEN PERCY, Newcastle (accepted)	468	12	10

PLYMOUTH.

For Building Boundary Wall, &c., to Charles Churchyard, Vennel Street. Mr. JAMES PATON, Borough Engineer.

J. Shaddock, Plymouth	£429	1	0
H. Kerswill, Plymouth	389	8	11
E. Duke, Plymouth	369	17	11
R. Rogers, Plymouth	364	6	0
Wakeham Bros., Plymouth	351	9	8
W. G. Goad, Plymouth	347	10	0
Westlake & Waldron, Stonehouse	340	17	2
TOZER & SONS, Plymouth (accepted)	320	12	9

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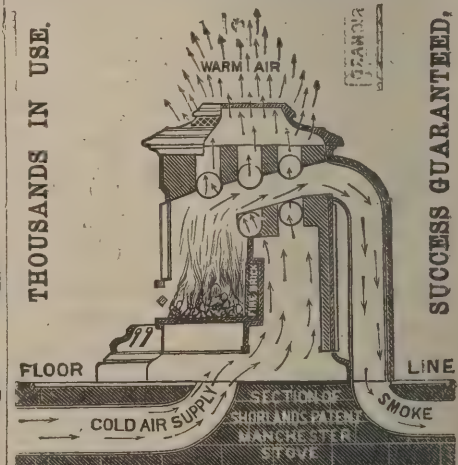
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H. Brown & Co., Newcastle-on-Tyne	£341	6	9
J. Carrick, Durham	198	0	0
T. Hedderley, Wallsend	182	0	0
J. Eskdale, North Shields	181	17	0
J. Henderson, Newcastle-on-Tyne	177	0	0
G. PETTIGREW & Co., Middlesbrough-on-Tyne (accepted)	172	0	0
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THE *Railway World*, Philadelphia, records the death of Mr. Albert Benton Pullman, at his residence near Evanston, Illinois, after a short illness. Mr. Pullman was born at Auburn, N. Y., on October 16, 1828, and received a public school education. Before reaching his majority he engaged in cabinet making at Albion, N. Y. In 1848 he removed to Grand Rapids, Michigan, where he engaged in the furniture business. In 1859 he removed to Chicago and entered into partnership with his brother, George M. Pullman, in the business of raising buildings to street levels. From 1860 to 1887 he was actively connected with the sleeping-car industry, and for nearly all that time was second vice-president of the Pullman Palace Car Company. Since 1887 he had spent his time in travel and at his home.

TENDERS FOR THE YEAR 1893.

THE following are a few of the more important works that were estimated for during 1893, and which appeared in our columns last year :—

BATH.

For Construction of Markwood Reservoir, for the Bath Waterworks Committee. Mr. W. FOX, Engineer, 5 Victoria Street, Westminster.

T. D. Ridley, Middlesbrough	£30,736	14	8
T. Evans, Cardiff	23,930	0	0
S. & E. Bentley, Leicester	23,250	0	0
J. Bond, Grays	29,205	0	0
W. Radcliffe & Co., Huddersfield	29,050	0	0
E. Tempest, Matlock Bridge	28,500	14	11
T. Colborne, Swindon	28,500	0	0
J. Dickson, St. Albans	27,040	3	3
Pauling & Elliott, London	26,284	1	1
Bond & Hitchcock, Taunton	26,209	13	9
T. Oliver, Totley	25,903	13	2
J. Strachan, Cardiff	25,150	0	0
Pethick Bros., Plymouth	23,954	0	0
Lloyd & Powell, Bristol	23,463	7	11
W. Jenkins, Pontypridd	22,890	18	3
J. Wilson, Lower Ince	22,288	17	11
Long & Sons, Bath	22,142	0	0
S. Ambrose, Bath	21,697	18	1
J. Nuttall, Manchester	21,461	18	7
A. Krauss, Bristol	21,000	0	0
A. Gall, Malvern Wells	20,547	9	5
G. Shellabear, Plymouth	20,426	0	0
G. Osenton, Westerham	20,208	14	10
G. H. Wilkins, Bristol	19,780	9	3
G. Bell, Tottenham	18,904	6	1
W. NEAVE & SON, Paddington (accepted)	18,278	11	9

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BRIGHTON.

For Erection of Higher Grade Schools at York Place, Brighton, for the Brighton and Preston School Board U.D. Mr. THOMAS SIMPSON, 16 Ship Street, Brighton, and Mr. JOHN W. SIMPSON, 10 New Inn, Strand, W.C., Joint Architects.

Bishop & Co., Shoreham	£17,662	15	0
Kilby & Gayford, London	16,730	0	0
Mid-Kent Building Co., Beckenham	16,652	0	0
W. Wallis, Balham	15,957	9	0
J. T. Chappell, London	15,594	0	0
J. Longley & Co., Crawley	14,875	0	0
P. Peters, Horsham	14,767	0	0
C. J. Slade, Maidstone	14,601	9	0
W. TAYLOR, Brighton (accepted)	13,926	17	6

CHICHESTER.

For Erection of the Sewerage Works. Mr. BALDWIN LATHAM, Engineer.

J. Bann, Essex	£50,991	11	1
Bentley, Leicester	49,603	17	3
G. Osenton, Westerham	41,633	0	0
A. Kellett, Ealing	39,479	1	3
J. Dixon Townsend, St. Albans	38,667	0	0
J. Neave, Forest Hill	37,447	0	0
T. Evans, Cardiff	37,217	16	6
W. & T. Denne, Walmer	35,740	0	0
G. Bell, Tottenham	32,827	0	0
H. Hill, Maidenhead	32,432	0	0
P. PETERS, Horsham (accepted)	31,967	0	0

DARTFORD.

For Erecting Eight Additional Blocks at the Gore Farm Hospital, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

T. Osborne	£34,414	0	0
J. & M. Patrick	34,329	0	0
Shillitoe & Son	30,000	0	0
Leslie & Co.	29,652	0	0
T. Knight	29,043	0	0
E. Lawrence & Son	28,262	0	0
Rochelle, Gover & Smith	27,571	0	0
C. Wiskin	27,129	0	0
L. Seager	27,027	0	0
JOHNSON & Co., Limited (accepted)	26,700	0	0

EDMONTON.

For Additions to Workhouse at Upper Edmonton. Mr. T. E. KNIGHTLEY, Architect. Quantities by Messrs. BATTERBURY & HUXLEY.

F. Voller, Wood Green	£27,498	0	0
F. J. Coxhead, Leytonstone	27,265	0	0
Lawrence & Son, Wharf Road, N.	27,245	0	0
Parnell & Son, Rugby	27,211	0	0
Allen & Sons, Kilburn	26,983	0	0
W. Shurmur, Upper Clapton	26,865	0	0
Treasure & Son, Harringay, N.	26,760	0	0
C. Wall, Chelsea, S.W.	25,909	0	0

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For Superstructure of Addition to the Buildings of the Public Record Office, for the Commissioners of H.M. Works and Public Buildings.

B. E. Nightingale	£78,554	0	0
J. Shillitoe & Son	76,500	0	0
W. S. Lorden & Son	76,000	0	0
Newmans, Limited	75,705	0	0
E. Lawrance & Sons	74,900	0	0
S. & W. Pattinson	73,369	0	0
D. Charteris	70,859	0	0
Perry & Co.	70,117	0	0
J. Allen & Sons	68,746	0	0
Holland & Hannen	68,660	0	0
J. T. Chappell	68,633	0	0
R. L. Holloway	68,139	0	0
Kirk & Randall	67,970	0	0
J. Mowlem & Co.	67,446	0	0
W. Brass & Son	65,333	0	0
FOSTER & DICKSEE (accepted)	64,950	0	0
J. O. Richardson	62,978	0	0

For Building Fire Brigade Station in Queen's Road, New Cross, for the County Council.

J. Allen & Sons, Kilburn	£15,965	0	0
Stimpson & Co., Brompton Road	15,370	0	0
Balaam Bros., Old Kent Road	14,714	0	0
Holloway Bros., Battersea	14,627	0	0
J. O. Richardson, Peckham	14,570	0	0
H. L. Holloway, Deptford	14,537	0	0
W. & H. Castle, Southwark Bridge Road	13,127	5	11

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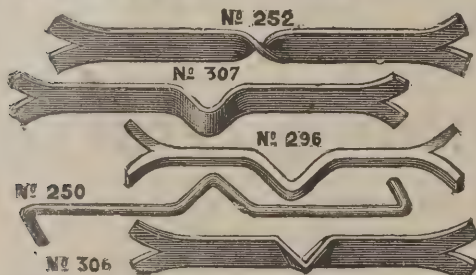
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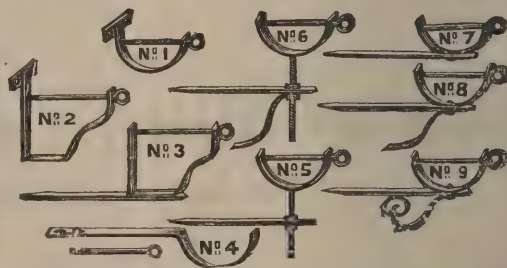
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For Building Second Portion of Parcel Office at Mount Pleasant, for the Commissioners of H.M. Works and Public Buildings.			
Martin Wells & Co.	£63,812	0	0
B. E. Nightingale	62,567	0	0
Perry & Co.	56,940	0	0
E. Lawrence & Sons	55,500	0	0
J. O. Richardson	55,080	0	0
Hart Bros.	55,000	0	0
Treasure & Son	53,320	0	0
C. Wall	52,042	0	0
J. T. Chappell	51,700	0	0
J. Allen & Sons	50,985	0	0
A. Kellett	45,021	0	0

For Building Administrative Block at North-Western Hospital, for the Metropolitan Asylums Board. Messrs. PENNINGTON & BRIDGEN, Architects.

Scrivener & Co., Regent's Park	£44,759	0	0
Willcock & Co., Wolverhampton	42,649	19	0
Perry & Co., Bow	41,800	0	0
Treasure & Son, Harringay	40,865	0	0
J. Allen & Sons, Kilburn	39,060	0	0
W. Shurmur, Upper Clapton	38,970	0	0
J. & C. Bowyer, Upper Norwood	38,880	0	0
H. Wall & Co., Kentish Town	37,610	0	0
Kirk & Randall, Woolwich	37,042	0	0
C. WALL, Chelsea (accepted)	36,500	0	0
Godson & Sons, Kilburn (withdrawn)	35,575	0	0

For Building Diphtheria Wards at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities by Mr. W. T. FARTHING, 46 Strand, W.C.

W. H. Lascelles & Co., Bunhill Row	£12,297	0	0
Bulled & Co., Croydon	11,646	0	0
F. G. Minter, Brindle Lane	11,490	0	0
C. Miskin, St. Albans	11,340	6	0
Wall & Co., Kentish Town	10,945	0	0
Leslie & Co., Kensington Square	10,691	0	0
W. JOHNSON & CO., LIMITED, Wandsworth Common (accepted)	10,487	0	0

LONDON—continued.

For Building Baths and Washhouses, Tibberton Square, Islington, N. Mr. A. HESSELL TILTMAN, F.R.I.B.A., Architect.

J. Allen & Sons	£38,965	0	0
Wilkinson Bros.	38,400	0	0
Lawrence & Sons	37,773	0	0
McCormick & Sons	36,963	0	0
W. Shurmur	36,882	0	0
H. J. Williams	36,840	0	0
H. L. Holloway	36,700	0	0
W. Shepherd	35,862	0	0
J. O. Richardson	35,758	0	0
Grover & Sons	35,748	0	0
Treasure & Son	35,697	0	0
Lorden & Son	34,568	0	0
MACFARLANE BROS. (accepted)	33,886	0	0

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For the Enlargement and Partial Reconstruction of the Marylebone Public Baths and Washhouses, 181 Marylebone Road, N.W., for the Commissioners. Messrs. J. WALDRAM & SON, Engineers and Surveyors, 13 Buckingham Street, Adelphi, W.C. Quantities supplied.

Jerrard, Lewisham	£36,949	0	0
McCormick & Sons, Canonbury	36,545	0	0
Britton, Highbury	36,496	0	0
Grover & Son, Islington	35,974	0	0
Johnson, Limited, Wandsworth Common	34,200	0	0
Allen & Sons, Kilburn	33,875	0	0
H. Wall & Co., Kentish Town	32,800	0	0
Yerbery & Sons, Kilburn	32,500	0	0
C. Wall, Chelsea	32,400	0	0

For Rebuilding Casual Ward and Local House, &c., Thavie Inn, E.C., for the Guardians of the City of London Union. Mr. F. HAMMOND, F.R.I.B.A., Architect, 1 Circus Place, London Wall, E.C.

Ashby & Horner	£17,980	0	0
Harrison & Spooner	17,945	0	0
Patman & Fotheringham	17,770	0	0
Colls & Son	17,530	0	0
Woodward	17,490	0	0
Ashby Bros.	17,431	0	0
W. & H. Castle	16,711	0	0
W. G. Larke & Son	16,284	0	0

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For Reconstruction of Four Bridges at the Isle of Dogs, for the County Council.			
A. Handyside & Co.	£63,863	3	10
Woodhouse & Rawson, Limited	62,001	0	0
Sir W. Arrol & Co.	58,158	9	10
Phoenix Foundry	57,955	9	7
A. Thome	57,541	0	0
Thames Ironworks	55,021	11	0

For Building Two Blocks for Nursing Staff at South-Eastern Fever Hospital, New Cross. Messrs. QUILTER & WHEELHOUSE, Architects.			
Leslie & Co., Kensington Square	£14,433	0	0
W. Brass & Son, Westminster	14,333	0	0
H. Wall & Co., Kentish Town	13,897	0	0
JOHNSON & CO., LIM., Wandsworth (accepted)	13,330	0	0
Battley, Sons & Holness, Old Kent Road	13,188	0	0
Osborne & Co., Orpington	12,010	0	0
Architects' estimate	9,500	0	0

For Extension of the Holloway to Hackney Storm Relief Sewer to Sandringham Road, for the County Council.			
T. Adams	£16,414	4	3
J. Price	14,645	14	9
Iles	13,353	0	0
J. Dickson	12,254	17	6
J. Mowlem & Co.	11,458	0	0

For Casual Wards, Great Guildford Street, S.E., for the Guardians of the St. Saviour's Union. Messrs. HENRY JARVIS & SON, Architects, 29 Trinity Square, Southwark, S.E.			
Chessum & Sons, Haggerston	£11,140	0	0
C. Ansell, Lambeth	10,989	0	0
J. Tyerman, Walworth	10,700	0	0
J. Marsland, Walworth	10,685	0	0
Lorden & Sons, Upper Tooting	10,371	0	0
Allen & Sons, Kilburn	10,350	0	0
F. J. Coxhead, Leytonstone	10,295	0	0
Balaam Bros., Old Kent Road	10,237	0	0
G. Parker, Peckham	10,185	0	0
Lawrence & Sons, City Road	10,101	0	0
H. L. Holloway, Deptford	10,100	0	0
Smith & Son, Norwood	9,889	0	0
J. O. Richardson, Peckham	9,739	0	0
Kirk & Randall, Woolwich	9,383	0	0

LONDON—continued.

For Supply and Erection of Three Steel Tanks at the Barking Outfall Precipitation Works, for the County Council.			
J. Tildesley	£16,284	2	0
W. C. Holmes & Co.	13,764	0	0
Whessoe Foundry Company	13,296	16	3
J. Fraser & Son	12,455	14	6
Goddard, Massey & Warner	12,095	8	6
W. R. Renshaw & Co.	12,010	16	6
Thames Ironworks	11,994	5	0
Braithwaite & Kirk	11,318	13	6
Sir W. Arrol	11,028	7	3
Heenan & Froude	10,797	0	0
Clayton, Son & Co.	10,330	14	3
Teeside Ironworks	9,424	3	4
J. Lysaght & Co.	9,169	7	4

For Building Infectious Diseases Hospital, Dog Lane, Stonebridge, for the Willesden Local Board.			
Lascelles & Co., Bunhill Row	£16,511	0	0
W. Shepherd, Bermondsey New Road	15,808	0	0
Yerbury, Kilburn	15,400	0	0
Lorden & Co., Upper Tooting	15,275	0	0
Cowley & Drake, Willesden Green	14,891	0	0
Lawrence & Son, Wharf Road	14,856	0	0
Carmichael, Wandsworth	14,645	0	0
Scharien & Co., Chelsea	14,510	0	0
Young & Lonsdale, Herne Hill	14,448	0	0
Godson & Son, Kilburn	14,278	0	0
Neave & Neave, St. John's Wood	12,870	0	0

MAIDENHEAD.

For Construction of Main Drainage, Pumping Station, Tanks Polarite Filter-beds, &c., Maidenhead. Mr. C. NICHOLSON LAILEY, Engineer, 16 Great George Street, Westminster.			
Cooke & Co., Battersea	£36,384	0	0
Bell, Tottenham	34,592	0	0
Kellett, Willesden	32,640	0	0
Peters, Horsham	31,045	0	0
Lawton, Twickenham	30,000	0	0
Neave, Forest Hill	29,980	0	0
Iles, Wimbledon	29,566	0	0
HILL, Maidenhead (accepted)	29,053	0	0
Osenton, Westerham	28,485	0	0

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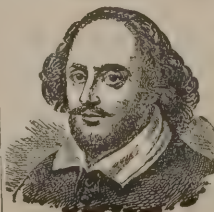
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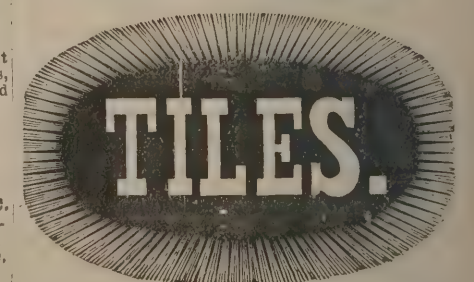
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Kirk & Randall	57,720	0	0
S. G. Halliday	57,701	0	0
H. Willcock & Co.	55,557	0	0
T. Martin	55,500	0	0
Parnell & Son	55,276	12	0
De Vere, Buckingham & Co.	54,243	0	0
J. T. Chappell, Pimlico	51,663	0	0

PLASNET.

For Building Board School for 1,898 Children, Shaftesbury Road, Plasnet, for the East Ham School Board. Mr. R. L. CURTIS, Architect.

N. Lidstone, Finsbury Park	£18,295	0	0
McCormick & Sons, Islington	17,945	0	0
W. H. Lascelles & Co., Bunhill Row, London	17,750	0	0
Hearle & Farrow, Stratford, E.	17,644	0	0
J. O. Richardson, Peckham	17,568	0	0
V. J. Maddison, Canning Town	17,457	0	0
John Allen & Sons, Kilburn	17,390	0	0
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J. G. Robson, Darlington	14,595	0	0
Craggs & Benson, Stockton-on-Tees	14,334	0	0
Bastiman Bros, Middlesbrough	14,056	2	3
A. J. Cooke, Stockton-on-Tees	13,799	0	0
Ives & Co., Shipley, near Bradford	13,590	9	9
Johnson & Hanby, Stockton-on-Tees	13,578	0	0
W. C. ATKINSON, Stockton-on-Tees (accepted)	13,334	4	7

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For Building Premises, Swansea, for Messrs. B. Evans & Co., Drapers. Messrs. J. P. JONES & ROWLANDS, Architects, Swansea. Quantities by the Architects.

Hatherly & Carr, Bristol (time, 21 months)	£22,980	0	0
W. Bowers, Hereford (20 months)	22,600	0	0
T. Watkins & Co., Swansea (24 months)	22,500	0	0
Holway & Parsons, Swansea (8 months)	22,293	0	0
D. C. Jones, Gloucester (15 months)	22,285	0	0
J. Linton, Newport (no time)	22,200	0	0
D. JENKINS, Swansea (12 months) (accepted)	22,100	0	0
J. D. Williams, Knighton (15 months)	22,000	0	0
Stephens, Bastow & Co., Bristol (18 months)	21,789	0	0
Perry & Co., London (9 months)	21,753	0	0
Architects' estimate	22,000	0	0

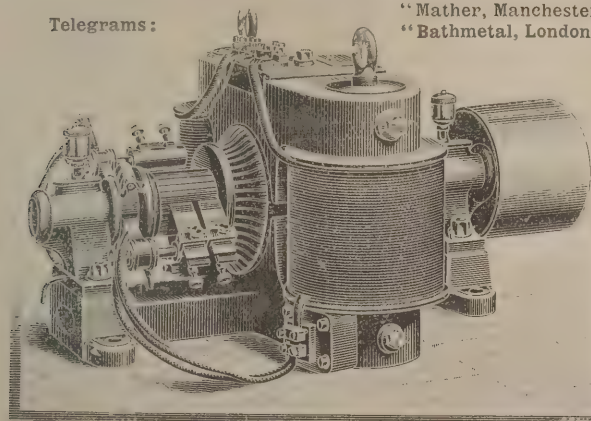
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W. Gregar & Son, Stratford	13,924	0	0
W. J. Maddison, Canning Town	13,730	0	0
C. Norman Phillips, London	13,497	0	0
Harris & Wardrop, Limehouse	13,497	0	0
W. Watson, Ilford	13,300	0	0
S. J. Scott, London	13,237	0	0
A. Reed & Son, Stratford	12,876	0	0
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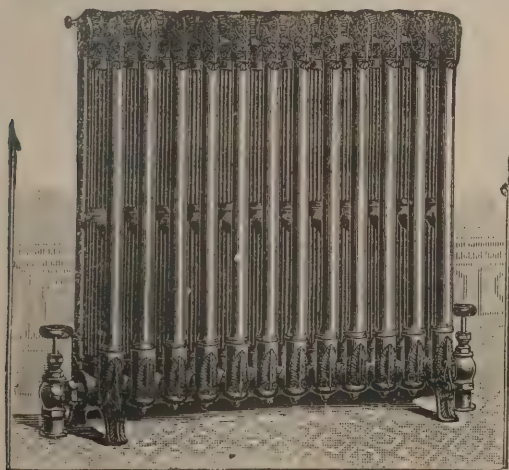
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A. & W. N. Meston, Parliament Street	21,075	10	0
A. T. Catley, London	18,905	0	0
T. Adams, Wood Green	17,076	2	7
P. Peters, Horsham	16,535	11	6
Wilkinson Bros., Finsbury Park	15,925	0	0
A. Kellett, Willesden	14,987	10	5
J. Dickson, London	14,813	10	0
B. Cooke & Co., Battersea	14,781	0	0
T. Evans, Cardiff	10,911	11	0

WORCESTER.

For Erection of Victoria Institute, for the Corporation of Worcester. Messrs. JOHN W. SIMPSON & E. J. MILNER ALLEN, Joint Architects, 10 New Inn, Strand, W.C. Quantities by Messrs. PINKS & WATSON, 45 Parliament Street, S.W.

Bromage & Evans, Worcester	£27,323	15	2	£673	19	0
H. Smith, Kidderminster	27,229	0	0	843	0	0
Heatherley Bros., Coventry	27,141	0	0	739	0	0
Kilby & Gayford, London	26,172	0	0	769	0	0
W. King & Son, London	26,166	0	0	874	0	0
Taylor Bros., Hastings	25,971	6	7	780	0	0
John Kendrick, Worcester	25,651	0	0	750	14	0
De Vere, Buckingham & Co., Basingstoke	25,176	2	3	737	4	11
H. Willcock & Co., Wolverhampton	25,149	6	0	772	0	0
B. Whitehouse, Birmingham	24,965	0	0	748	0	0
P. Peters, Horsham	24,672	5	6	748	9	6
E. H. Lovatt, Wolverhampton	24,369	0	0	729	0	0
G. F. Smith & Sons, Leamington	24,362	0	0	738	0	0
C. W. King, Cheltenham	24,351	13	3	677	1	8
W. Bowers & Co., Hereford	24,071	18	9	735	1	5
John Bowen, Birmingham	24,065	0	0	689	0	0
J. Wood & Sons, Worcester*	23,833	0	0	712	0	0

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BUILDING AND BUILDERS.

THE building permits issued by the City Commissioner for the city of Toronto for the year 1893, the *Canadian Architect* says, fall short of those of the preceding year by more than 1,000,000 dols. This is partially accounted for by the fact that the permit for the new City and County buildings, amounting to 1,000,000 dols., was included in last year's record. It is yet too early to speak with any degree of authority regarding the outlook for 1894. The opinion prevails, however, that the lowest point has been reached in the depression which has prevailed in Toronto for some years past, and that the tendency will be upward in the future. It seems clear that no building of a speculative character will be done in Toronto for some years to come, and this is regarded by reputable builders and others who have at heart the welfare of the city as something to be thankful for. It is believed that a fair amount of building will be done next year in the business portion of the city.

THE same paper also says that the manufacturers of Canadian cement are complaining of the action of the Dominion Government in using imported cement in the construction of the Soulages Canal. This is the first instance, so far as we are aware, in which imported cement has been used in Canadian public works of this character. In the construction of the Welland and Sault Ste. Marie Canals Canadian cement was employed, and the durability of the material in the case of the Welland Canal at least has been amply demonstrated. No reason has been given by the Government for the use of imported cement in the Soulages Canal except that they felt bound to act on the advice of their engineer.

It is reported that a site has been fixed upon in Chelsea for the home of the British Institute of Preventive Medicine, the building of which is estimated to cost between 25,000*l.* and 30,000*l.* There will be finely-equipped laboratories, and a scientific staff will be appointed to provide for lectures, &c.

At the meeting of the Markets and Fairs Committee of the Birmingham City Council a number of instructions were drawn up for the guidance of architects in the preparation of plans for the new dead-meat market and slaughterhouses, to be erected between Bradford Street, Cheapside, and Sherlock Street East. Architects will be allowed about two months to complete the plans.

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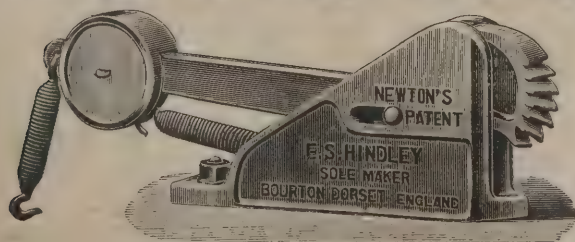
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DURING the past year the Dean of Guild Court of Hamilton have had before them thirty-three petitions for the erection of new buildings, the estimated cost of which is 27,940*l*. They have also disposed of thirteen petitions for alterations, the estimated outlay of which is about 3,800*l*.

ST. STEPHEN'S CHURCH, Grampound Road, Cornwall, was reopened by the Bishop of Truro, on Thursday, December 28, 1893, after undergoing a thorough restoration. The church is in many respects very interesting from an architectural standpoint, having a considerable amount of Early Norman work remaining. The restoration has been carried out at a cost of between 1,200*l*. and 1,300*l*. from the designs of Mr. Geo. N. Fellowes Prynne, F.R.I.B.A., of Westminster, by Mr. James Julian, builder, of Truro. The heating apparatus has been supplied and fixed by Mr. De Ridder, of Liverpool.

VARIETIES.

THE *Birmingham Post* says:—In these days, when "records" are so frequently broken, it may be of interest to state that 1893 has been a record year in the history of the Birmingham Fire Brigade. During the twelve months the brigade has been called out 702 times, as compared with 587 in 1892, or an increase of 115. Of the 702 calls, 489 were to actual fires, 128 to chimney alarms, and 85 were false alarms.

THE opening chapters of Miss Braddon's new story, "Thou art the Man," perhaps the most powerful she has ever written, will begin next week in the *Gentlewoman*, and will be profusely illustrated by Mr. Everard Hopkins.

THE Board of Trade have held an inquiry at Leeds with reference to an application by the Corporation for powers to borrow 130,000*l*., required in connection with the purchase of the Leeds tramways undertaking.

THE Airdrie Iron Company, engineers and ironfounders, successfully cast at their works yesterday a huge anvil block, 40 tons in weight, for the Portland Forge Company, Kilmarnock. It is expected it will take about a fortnight before the casting is sufficiently cooled down for handling. This is by far the largest casting ever done in Airdrie.

THE expense of widening the new bridge at Dumfries, amounting to 4,300*l*., has been defrayed by Miss M'Kie, of Moat House. The gift, which was announced two years ago, was in the first instance anonymous. Sir William Arrol, who was

engaged as consulting engineer, declined remuneration for his services, and he has been presented by Miss M'Kie with a piece of silver plate.

THE Paddington Vestry have under consideration a recommendation from their sanitary committee to the effect that a lady sanitary inspector be appointed tentatively for one year at a salary of 60*l*.

In the *Glasgow Herald* a London correspondent states, "I understand that Mr. Shaw-Lefevre, who has recently been to Edinburgh, is of opinion that no substantial or serious repairs are necessary at Holyrood Palace, and that therefore there is no need for any special expenditure upon that building. But Mr. A. C. Morton, who has taken considerable interest in the subject, intends, I believe, to suggest that if the Government will not spend money on the Palace to put it in a proper condition, it should be handed over to the Edinburgh Corporation, who will doubtless take a pride in restoring and upholding this interesting historical monument."

THE statuary on the north transept of Westminster Abbey, illustrated in Mr. Burke Downing's article, is the work of Mr. Nathaniel Hitch, sculptor, of Vauxhall.

ELECTRICAL.

BEFORE the old year gave place to the new year, the Philadelphia *Ledger* was able to record the inauguration of the electric light column. The huge wooden casing in front of Wanamaker's, it says, was taken down, and there stood revealed a handsome column of incandescent bulbs, with broad spiral stripes, each of a different colour, white, blue, purple, orange, green, yellow and crimson predominating. The column is about 25 feet high, and from it extend four long arms lined with rows of glass bulbs of different colours, two of the arms in the side aisles terminating in 25 bulbs each, and two in revolving balls of 266 bulbs each, at either end of the Chestnut Street façade, all handsomely coloured. At intervals of a few seconds each stripe flashes with light, one brilliant colour swiftly following another until the top of the column is reached, when the varying light is diffused along each of the arms until the two large bulbs are reached, where the flashing continues until all the colours are shown. Meanwhile the two large balls are kept revolving, and flash continuously with varying lights and colours. The whole affair, whose effect is very pretty, is ingeniously managed by a switchboard in the base-

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GOLD MEDAL, Inventions Exhibition, 1885.

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ment under the column, where a large cylinder, somewhat like that of a music box, is kept revolving by the dynamos of the establishment, the teeth in the cylinder closing and cutting off the circuit as contact is made with or withdrawn from the rows of separate conductors on the sides of the switchboard. As the lights change from one colour to another they go out completely, leaving no lingering glow in the carbons to spoil the effect, as would be the case were it not that this has been guarded against by a current of air being ingeniously injected automatically by the machine.

THE Vienna correspondent of the *Standard* says:—The company which owns all the tramways in the Hungarian capital, having altogether a length of 90 kilometres, or about 56 miles, has resolved to adopt electricity as the motive power over the entire system. The installation, it is computed, will take three years to complete. The total cost of the change will, it is calculated, amount to 10,000,000 florins.

THE Local Government Board have given their sanction to the raising by the Ealing Local Board of a loan of 25,000*l.* for purposes of electric lighting within their district.

It is understood that in Easter week an appeal will be made for funds to introduce the electric light into St. Paul's Cathedral and to complete the work of decoration.

TRADE NOTES.

WE have lately had introduced to our notice by Messrs. Smith & Co., of 45 Oxford Street, Manchester, a new sensitised paper for copying architects and surveyors' plans, to which they have given the name of "Simplex" paper, and for which they are the sole agents. The chief advantage claimed for this paper is that it produces black lines on a white ground with a water bath only, no chemicals of any description being required. This, as can be well understood, is an immense step from the old ferro-prussiate and other kindred processes, and the result obtained allows of the print to be coloured in the same manner as an original drawing. Its extreme simplicity also should bring it within the reach of many architects who are unable at present to copy their own plans, owing to the space and manipulation required for the chemical baths necessary for the other processes giving positive prints. The specimens that we have seen printed from this paper are far superior to the results obtained on any other sensitised paper brought to our notice,

the lines coming out a good black on a perfectly white ground. The price also is no higher than that of the best gallic acid paper. Messrs. Smith & Co. are also makers of the frames and baths, &c., necessary for this and other kindred processes, and also hold a large stock of all accessories for the full equipment of a draughtsman's office, and will forward full particulars of their specialties on application.

ALDERMAN FAWCETT, J.P. for York, has presented a new illuminated turret striking clock to St. Lawrence's Church, York, which was started on New Year's Eve, the same having been made and erected by Messrs. W. Potts & Sons, of Leeds.

THE new Technical Schools, Birmingham, are now being pushed forward, and the matter of heating and ventilation having received a large amount of consideration, the scheme of mechanical ventilation and heating prepared by Messrs. Baird, Thompson & Co. has been selected and the contract placed with them.

THE *Liverpool Courier* says:—The Welsh slate trade shows signs of steady improvement. The large and small quarries are generally working full time, while the demand in many instances is in excess of the supply. The monthly statement submitted to the Carnarvon Harbour Trust yesterday showed that 6,413 tons of slates had been shipped during the month, as against 6,398 tons in the corresponding month last year. During September, October and November 20,687 tons had been shipped, as against 19,924 for the corresponding period last year.

THE *Glasgow Herald* states that a proposal has been made to hand over the Perth Public Swimming Baths, with the whole works connected therewith, free to the Police Commission, for the purpose of being administered and managed by them as the local authority.

THE Albion Clay Company, Limited, Woodville, Burton-on-Trent, and 18 New Bridge Street, London, E.C., have been granted the highest awards for all their exhibits at Chicago. These include the "Sykes's" patent joint-pipes, the patent "Paragon" pipes, and other stoneware. Their exhibit of stoneware pipes, it is claimed, was the most important of the kind in the exhibition. The company manufacture all their pipes from their own stoneware clays (not fire-clay). They are of a hard, impervious body, true in form, and well glazed. They have been proved by severe tests by engineers and also at Kirkaldy's to withstand the highest pressures ever applied to stoneware pipes. Mr. Henry Knowles, the managing director, is the inventor of the patent "Paragon" pipes. He is also the

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inventor of the patent direct-action kilns in which all the goods manufactured by the Albion Clay Company, Limited, are burnt. He received the highest award for the patent kilns at the International Inventions Exhibition, London, 1885, and has been granted the highest award, diploma and medal for the kilns at Chicago.

MESSRS. PARSONS & HARRIS, of Sidney Grove, E.C., have recently introduced a heating apparatus, which should achieve a large measure of success. Parsons's "Radiator," as it is called, is available for steam or hot water, and is equally suitable for public or private buildings. Ornamental in design, and occupying about 40 per cent. less space than is usually needed, it is cleanly, as the whole of the heating surface is vertical, which prevents the accumulation of dust; it is self-ventilating, and the heating power can be easily regulated. The steam or hot water, as the case may be, circulates in the internal passages, the heat from which is conducted along the webs of metal and around the external or air passages. The cold air enters at the bottom, where the supply can be regulated by the ordinary air-inlet valve, passes up through the passages heated by conduction, and therefore is not scorched, and emerges through the top grating having a comfortable healthy warmth imparted to it. At the same time the air contained in the apartment is heated by contact with the external surface all over the radiator, also by conduction. This patent radiator heats the incoming air without extracting the moisture and without rendering it parched by direct contact with the bare steam pipe. In short, it is healthy in use, attractive in appearance, and economical in price and in working.

We have received the annual catalogue of the Pullman Sash Balance Company, of Rochester, New York (Mr. Robert Adams, of London, sole agent). It gives full particulars of the Pullman sash balances, Pullman car window balances, Pullman wall-case balances, Pullman show-case balances and Pullman steel spring hinges, with very useful directions of how to fix them. The spring sash balance is adapted for old as well as new work, and can be used in many places where weights and cord cannot be used. It is easily applied, runs noiselessly, and has an attractive appearance, and it is warranted to be practically indestructible.

We are informed that Messrs. Baird Thompson & Co. have some very large contracts on hand at the present moment, but that, with their three works in London, Glasgow and Birmingham they are able to cope with any work placed in their hands for heating and ventilation.

PUBLIC IMPROVEMENTS AT CHARING CROSS.

THE following proposals have been made by Mr. Wm. Woodward, and will be considered at the next meeting of the Society of Architects:—

It will be readily conceded that the Metropolis can well afford to have bestowed on it some of those artistic municipal delights which distinguish continental cities and make the English visitors yearn for a taste of them in their own grand London.

The improvements which have for many years occupied my mind and the minds of all those who have at heart the convenience and beauty of London are many, but at this time I confine myself to works at Charing Cross, which, whilst affording an opportunity for the immediate engagement of hundreds of the unemployed, will, I venture to predict, astonish Londoners by the transformation which will be effected, and lead them to ask why it was not all done years ago.

I will divide the subject into three broad headings:—

1. Improvements at St. Martin's Church.
2. Alterations at and the beautifying of Trafalgar Square.
3. Opening of the Mall of St. James's Park into Charing Cross.

1. It is well known that at the west front of St. Martin's Church the roadway narrows into the neck-of-a-bottle shape and, combined with the almost dangerous and unsightly steps to the portico, renders this busy-with-traffic point exceedingly inconvenient. My proposal is to clear away the whole of the steps to the portico, with the exception of the upper step (which should be left to afford an adequate and apparent support to the columns) and to build under and flush with that upper step what is known in architecture as a "podium" (or wall carrying a portico), similar, in fact, to the wall of the portico at the National Gallery, but not, of course, nearly so high. This wall would be continued north and south so as to enclose the new steps which at the north and south ends would lead up to the western entrance to the church. The wall is designed to harmonise with the architecture of the church, and handsome piers and standards would provide for effective lamps to light the surroundings.

An average width of about 12 feet would thus be thrown into the public roadway and all the inconvenience and unsightly effect of the steps be at the same time removed.

AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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2. It is the mere relation of an acknowledged fact to say that Trafalgar Square is about as woe-begone and miserable an open space as can be imagined for so fine a site.

My proposal is to clear away the awkward and unarchitectural steps at the north-east and north-west corners returning the balustraded wall as shown on the plan. To shift the "Napier" and "Havelock" statues respectively further east and west, so as to form fitting terminations to the east and west extended enclosing walls of the square. To shift the granite posts, which are now too far north in the square, to the edge of the footway proper at the southern side of the open space. To clear away the present basins with their mean and paltry water jets, and, having removed the Gordon statue, as hereafter described, from the centre of the square, to transport the "Shaftesbury" fountain from Piccadilly Circus (where it is acknowledged to be quite out of place), and fix it in the centre of the square—raising it bodily 4 feet on a granite base, and providing a large circular basin into which there would be ample room for the jets to play, and introducing further jets at the upper part of the fountain to afford a more lively and picturesque water display. To take down a portion of the balustraded wall of the northern terrace of the square, immediately opposite the centre of the National Gallery, and to build a grand central staircase thus affording a dignified and handsome approach to the square, and opening up the front of the National Gallery as seen from the south. The enclosing walls of the steps would be terminated, that on the west by the removed statue of Gordon, and that on the east by a new statue, say to Lord Shaftesbury. The piers at the mid-way landing and at the top of the steps would be adorned by lamps and sculptured groups or figures. Then the square, as a whole, extended by the shifting of the granite posts southwards would be laid out as a public garden with perambulating gravel paths 12 feet wide, and ornamented with shrubs, dwarf trees and flowers, and provided with numerous seats. At the north-west angle whence the old steps will have been cleared away, a public lavatory for ladies will be provided, extended under the terrace, and at the north-east angle will be formed a similar lavatory for gentlemen, these taking the place of those removed as hereinafter described from near the statue of Charles I. The one equestrian statue now in the square, that of George IV., would be removed to the triangular space in St. James's Park, opposite Carlton House Terrace. The unsightly raking enclosing walls on the east and

west sides of the square would be improved by being broken up into horizontal lengths, with piers at the breaks, upon which would be placed lamps.

3. By the removal of only six houses at Cockspur Street, from the north-west corner of Spring Gardens, westwards, and a few of the old houses in Spring Gardens—the latter already, I believe, in the possession of the Treasury—one of the finest avenues and vistas would be at once formed. In a line with the Strand, the whole of the Mall, with its row of trees, as far as Buckingham Palace, would be open as a drive to the west, beautiful in itself, and affording great relief to the traffic to Victoria Station and westwards. Just at the commencement of the new avenue I propose to build a grand triumphal arch, 100 feet in total width, and fronting the avenue would be the New Admiralty and War Offices, now in course of erection, and other building sites of great value would be necessarily formed and be available for extension of the London County Council accommodation, or otherwise as the authorities may decide. The statue of Charles I. would be shifted in position so as to look up the new avenue, and the public underground lavatories near it would be transferred to Trafalgar Square, as before stated, and the space be filled up.

The drawings which accompany this outline description show the whole of the proposed scheme. Successive Governments have promised the opening up of the Mall, and the report of the Committee on the new Admiralty and War Offices also distinctly provides for it, the new buildings having also been laid out with that end in view. I now most earnestly entreat the Government, the London County Council, the vicar of St. Martin's and the local authorities to give to the subject their strenuous exertions so as to secure the immediate start of the works, thus affording employment to many of the unemployed, and effecting grand, useful and beautiful improvements worthy of this rich and magnificent metropolis.

So far as my personal share in the matter is concerned, I may be pardoned for stating that with the exception of the opening of the Mall and the Triumphal Arch—plans for which were some years ago prepared by the architect, Mr. John Robinson, in conjunction with me, and published by the Royal Institute of British Architects—the whole of the designs belong to me as their sole author; but I am, nevertheless, quite prepared to hand them over, free of charge, to any authority deputed to carry them out, or I shall be willing to undertake myself the usual architectural supervision and preparation of the necessary detail drawings and specifications.

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THE DESTRUCTION OF BABEL: THE SCATTERING OF THE PEOPLE.

RICHMOND HOSPITAL.

THE Richmond Town Council have, after a good deal of difficulty, settled the long-standing hospital question. They have entered into an agreement with the Heston and Isleworth Local Board to purchase for 3,000*l.* 17 acres of land at the southern corner of Hounslow Heath, separated from the heath by the Windsor line of the London and South-Western Railway, and here the two authorities will construct a hospital at a cost of 6,000*l.* The existing hospital of the Heston and Isleworth Local Board at Dodswell is to be taken over by both authorities, and retained as a small-pox hospital. The costs, with some exceptions, are to be apportioned on the rateable values of the two districts. The hospitals will be about four miles from Richmond. The Town Council will not now need to proceed with the application for compulsory powers to obtain the Fern Hill site.

THE CONNAUGHT DURBAR HALL.

A RECENT number of the *Bombay Gazette* says:—Lord Harris at the invitation of the Chiefs of Kathiawar has just performed an interesting ceremonial at Rajkot. The occasion was the opening of a fine building, erected by the contributions of the chiefs to commemorate the presence in Kathiawar of H.R.H. the Duke of Connaught, while Commander-in-Chief of the Presidential Army—an historical institution which will require in a week or two a memorial to show that it had once existed—and the services of two other British officers well known and beloved in the Province. The Connaught Durbar Hall occupies the centre of the building, which, with a museum commemorative of Colonel Watson, and a library, bearing the name of Colonel Lang, will be known as the Memorial Institute. The Institute was originally intended to commemorate the Jubilee of the Queen-Empress, in honour of which the chiefs subscribed a sum of nearly two lacs to be expended on a durbar hall and a museum. The urgent need of a supply of pure water

for Rajkot induced the chiefs to consent to the money being laid out on the construction of waterworks, which bear the name of the Victoria Jubilee. This new project was successfully carried out, and the works were formally opened by the Political Agent, Sir Charles Ollivant, last year. The first proposal was, however, received in an improved form at the suggestion of Sir Charles. The chiefs and the Kathiawar public subscribed a considerable sum to erect a museum as a memorial to Colonel Watson, who died in 1889, after being connected with the Province for twenty-five years, during which he identified himself with its prosperity and progress, and made himself greatly beloved. It was suggested that the money available should be supplemented by further contributions to erect a memorial institute on a scale sufficient to fulfil several purposes. It was decided to erect a building, combining under the same roof a durbar hall, a museum and a public library, of which the Lang Library, which was very inadequately housed, should be the nucleus. The work has been accomplished by the united efforts of the chiefs themselves. A capacious and stately durbar is, of course, required for public ceremonials, which the chiefs of the Province attend together in pomp from time to time for the reception of the princes of the blood and other distinguished visitors, for investitures, and the like. Such a hall of audience has been designed and erected by Mr. R. B. Booth, C.E., and Agency engineer. The structure forms an imposing *ensemble* in cut stone, standing in a beautiful garden, which is in many respects an admirable adjunct to the museum, for many beautiful stone carvings rescued from destruction in various outlying parts of the Province have been effectively displayed about the grounds, where they are protected from risk of destruction or injury.

The function at which Lord Harris assisted on Friday last was brilliant and imposing. All the principal chiefs were present with their picturesque following. The popular Maharajah of Bhownugger, on behalf of all the chiefs of Kathiawar, in an appropriate and graceful speech, requested his Excellency to open the building. The Institute, his Highness justly said, perpetuates the kindly recollections which Kathiawar retains of the Duke of Connaught and the two other distinguished British officers, who had lived and died amongst them. The Connaught Durbar Hall proves to be admirably adapted for its special purpose, and forms an appropriate setting for pomp and pageantry. Sicilian marble has an effective part in the decoration of the floor, but the structure as a whole is built of the excellent sandstone, for which



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Kathiawar is famous. The quarries of Vankaner, which supplied this particular stone, are only twenty-five miles from Rajkot. The abundance of the excellent raw material which lends itself to the skilful chisels of the Rajkot artisans, famous as stonemasons and carpenters, has enabled Mr. Booth to erect the building at less than half the cost a similar structure in Bombay would have involved. The marbles from Italy, which are to be seen in the handsome mosaic of the floor and the white steps by which the dais is approached, were imported in preference to utilising the Kathiawar marbles, because it is more economical to work the finer-grained marble than the coarser and harder blocks of the country. There is, however, a future for the Kathiawar marbles; it will not be the fault of the Rajkot masons if they are not more fully utilised, for they are indefatigable in experimenting with them. The most interesting collections in the museum are the samples of building-stone and marble from the different States. Porebunder stone, to which every building in Bombay owes so much of its lightness and nearly all its carvings, is to be found over three-fourths of Kathiawar. The convenience of shipment at the port of Porebunder has induced importers to bring stones from the quarries in that immediate neighbourhood; but excellent white sandstone of similar quality is to be found in many other localities. The handsome Porebunder pillars supporting the large galleries of the Watson Museum come from Vankaner. Junagadh and Jamnagar display many fine specimens of marble as does also Gondal with limestone and sandstone. A fine model of the Memorial Institute has been sent to the museum from the State of Dhrangadhra. The Durbar Hall, the museum and the library are each carved out of a solid block of sandstone, every detail being accurately reproduced. The bandstand, in carved stone, one of the most conspicuous ornaments of the institute gardens, has been carved by the workmen of the country from a sketch of one of the oldest examples of Hindoo work in Kathiawar. Innumerable figures which in the original were nude and therefore inappropriate, have been replaced by the inventiveness of each individual mason, who sketched out in pencil athletes, soldiers, British sportsmen gun in hand, English ladies going to church with their prayer-books in infinite variety, and a naive confidence in Ruskin's principles that decorative architecture owes everything to the initiative of the individual workman. This unique bandstand is the gift of the Thakore Saheb of Gondal. The most effective features of the garden, created out of a most un-

promising river-bed, are the trophies of ancient Hindu architecture, dug out from mounds of rubbish in different parts of the Province. Five elephants fighting show that two thousand years ago the Hindu sculptor knew very well how to put vigour and life into his work. The Thakore Saheb of Limbdi has enabled the Agency engineer to construct a very picturesque conservatory, the entrance to which is composed of carvings rescued from the *débris* of famous temples ruined eight hundred years ago by the first Mahomedan conqueror who visited India. How long the buildings had stood before Mahomed of Ghazni appeared on the scene it is impossible to say. The Watson Museum and the institute gardens will prove of the greatest assistance to archæological investigation by preserving in a conveniently central position valuable fragments of old sculptures and rare inscriptions, which were perishing from neglect and ill-usage in the wilder parts of the country.

One of the most honourable characteristics of the Chiefs of Kathiawar who have combined to erect the Memorial Institute is the generous emulation with which they contribute adjuncts that enhance the usefulness and attractiveness of the Institute. Mr. Frank Brooks, having made drawings from the life of Kathiawar lions, the Nawab Saheb of Junagadh is defraying the cost of having a pair of Gir lions sculptured and placed at the entrance of the museum. Mr. Brooks's palette has been utilised in the portraits of the twenty-eight princes which adorn the Durbar Hall. He has also painted admirable likenesses of Lord Harris, Sir Charles Ollivant, Colonel Hancock, the acting political agent. The portrait of Mr. Booth rightly finds its place on the walls of the building which he designed and erected with so much talent. Over the dais are three royal portraits, for which the chiefs specially subscribed. The centre shows a full-length representation of Her Majesty by Macbeth Raeburn, after the famous presentment of the Queen by Angeli. On the right is the full-length portrait of the late Duke of Clarence, who visited Kathiawar during his tour in India—the artist is Mr. A. Soord. On the left is a portrait of the Duke of Connaught by Mr. C. L. Burns. The Lang Library, which commemorates Colonel W. Lang, contains several interesting portraits. That officer was Political Agent from 1846 to 1859, when Kathiawar was so little advanced that it was due to his private liberality that the first girls' school was established in the Province. He was an administrator of a type now almost extinct, working according to his view of the necessities of the case, and troubling himself little about rules and regulations. He was suited to the time and the people and did excellent work in his day

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and generation. His memory was commemorated by the establishment of the first library ever established in Kathiawar. His portrait hangs on the wall of the new library, as does also the portrait of the first Political Resident in Kathiawar. The commemorative tablet of the gallant young Lieutenant Gordon and the sowers who perished with him when breaking up a band of dacoits a year since will find a suitable place in a panel of the library wall. The library will fulfil another function. The ladies of the station will be admitted to a sub-division of the library set apart for reading and conversation. Thus the Memorial Institute at Rajkot will combine with its other civilising and formative agencies some of that social charm which the Royal Bombay Yacht Club has known how to associate with the advancement of yachting and the diffusion of a taste for nautical adventure.

ARBITRATION CASE.

THE case of *Nightingale v. Sir C. Nicholson* and others (the London, Liverpool and Globe Insurance Company) has been opened before Mr. P. E. Pilditch, sole arbitrator, at the Surveyors' Institution. The claim is for a considerable sum, and is made by the builder, who reinstated a large block of warehouses at Rotherhithe, against the insurance company, who undertook the reinstatement. Our readers will remember that the disastrous fire in question has already formed the subject of an action at law between the owner of the warehouse and the insurance company. For the plaintiff, the builder, appeared Mr. F. R. G. Radcliffe, instructed by Messrs. Mackrell, Maton & Godlee, and for the insurance company, Mr. Dickens, Q.C., with whom was Mr. Cecil Chapman, instructed by Messrs. Lee & Pemberton. The following professional gentlemen gave evidence on behalf of the plaintiff; Mr. Alexander Stenning, district surveyor for Rotherhithe (who appeared on subpoena), and Mr. Perry, of the firm of Messrs. Perry & Reed, architects. The case, in which a number of interesting points have been raised, is expected to last several days longer, and the hearing was adjourned until the 16th and 17th proximo.

BRITISH AND GERMAN IRON MANUFACTURE.

THE American Consul-General at Frankfort in a recent report describes the results of German economy in iron manufacture. After examining the statistics of British and German production

of finished iron and steel between 1880 and 1892, he comes to the conclusion that, while in this period Great Britain shows an increase in production of only 70 per cent., the German increase has been 400 per cent. This latter increase has gone on in spite of the increasing cost of coal in Germany, due to the higher wages demanded by miners and the greater consumption in the face of a definitely limited supply. The Consul-General attributes this result to two causes—first, the introduction of the basic process, which enables the ironmasters of Westphalia, Silesia, and the Saarbruck district to use their cheap and abundant native ores; and, secondly, the unrivalled chemical skill of the Germans, by which they have succeeded in saving the by-products of coke manufacture, thus deriving a revenue from a process which in other countries entails a waste of material and a financial loss.

THE LONDON WATER SUPPLY.

AMONG the Bills which will be introduced next session into Parliament by the London County Council will be one "to empower them by agreement to purchase or take on lease and hold lands and water rights." The following is the text:—

"Whereas, under the London Water Act, 1892, the London County Council have power to introduce Bills relating to the supply of water in the administrative County of London and within the limits of supply of the metropolitan water companies; and whereas some of the areas in Great Britain best adapted for sources of water supply have been already appropriated under the authority of Parliament by the municipal authorities of the principal cities and towns, and powers for the appropriation of further areas have been from time to time granted, and are from time to time applied for on behalf of other populous and increasing places; and whereas it appears that the means for the supply of water to London and the neighbourhood are inadequate, and that larger quantities of water than can now be legally obtained are required for that supply, and that, if the rivers Thames and Lea are to be relied upon for the future water supply of London, considerable additions are necessary to the arrangements for storage, filtration and purification; and whereas it is estimated, in view of the probable increase in the population of London and the neighbourhood, that the existing sources of supply might at no distant period

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become inadequate, while the increasing population in the valleys of those rivers will render it increasingly difficult to maintain their water sufficiently pure and wholesome for drinking purposes; and whereas it is expedient that powers should be conferred on the Council under which, as occasion may offer, the Council may have power to purchase land and water rights which they may think it desirable to secure with a view to the future supply of water for London and the neighbourhood; be it therefore enacted as follows:—

"Clause I.—This Act may be cited as 'The London County Council (Water) Act, 1894.'

"Clause II.—It shall be lawful for the Council to purchase by agreement or take on lease:—

"(1) Any lands, houses and buildings or easements; and

"(2) Any waterworks, wells, waters, or rights to take or convey water

which the Council may think it desirable to purchase or take on lease with a view to the future supply of water to London and the neighbourhood.

"Clause III.—It shall be lawful for the Council to hold and manage any such lands, and from time to time to let such lands, works, or rights, or any of them on lease or otherwise, and to sell or exchange any of such lands."

A Bill has been deposited by the West Middlesex Waterworks Company at the Private Bill Office of the House of Commons to enable them to raise additional capital to the extent of 500,000*l.* in view of the increasing requirements of the company's district and the large expenditure which they are about to incur in providing new reservoirs. A Bill has also been deposited by the Southwark and Vauxhall Water Company asking power to make a service reservoir, situated partly in the parish of St. Giles, Camberwell, and partly in the parish of Lewisham, a storage reservoir in the parishes of Hampton and Sunbury, and a subsiding reservoir in the parish of Hampton, with the necessary works relating thereto. In regard to these works the company seek to stop up the private footpath leading from the Lower Sunbury Road to the River Thames. In addition to the daily quantity of 24,500,000 gallons which the company are authorised to take from the Thames, they ask power to take such further water as they may require, provided that, if similar action is taken by the metropolitan water companies, the daily flow over Teddington Weir shall not be reduced below 200,000,000 gallons. For the purposes of the Bill the company ask power to raise 750,000*l.* additional capital.

RAILWAY COMPANIES AND THE BUILDING ACT.

A DECISION was recently given by Mr. H. J. Bushby at the Worship Street Police-court, in a case which had been argued before him on a previous occasion.

A summons was taken out against Messrs. Kirk & Randall, contractors, by Mr. Henry Lovegrove, district surveyor of South Islington and Shoreditch, in each of the following cases. A building had been erected at the cost of the London and North-Western Railway Company in Maria Street, Shoreditch, for the purposes of storing fodder for Messrs. Allsopp & Co. The contractors were instructed by the railway company not to give notice and not to pay the fees. The building was completed while the parties were discussing the matter, and the summons was therefore for fees instead of neglect to give notice. Another building to be used by Messrs. Cameron & Co., coal merchants, had been erected under similar conditions. The magistrate having cited the various cases, gave judgment for the district surveyor, with costs in each case.

As this is a very important matter, a case will be stated for the decision of the Queen's Bench Divisional Court.

THE STOCKPORT SEWAGE WORKS CONTRACT.

AT a special meeting of the Stockport Town Council held to consider a recommendation of the sewage outfall committee that the tender of Messrs. T. & W. Meadows, of Heaton Norris, should be accepted for the construction of the first section of the main intercepting sewer which is to take the sewage of the borough to works of filtration about to be constructed at Cheadle Heath, and so help to purify the river Mersey, one of the feeders of the Manchester Ship Canal. The amount of the tender is 33,500*l.* Eleven other tenders had been sent in, one of them from Mr. Peter Smith, of Manchester being 31,064*l.* 9*s.* 9½*d.* In explaining why the lowest tender had not been accepted, Alderman W. Lees said that no member of the committee knew anything of the person who sent in the lowest tender.—Several members of the Council expressed surprise that Mr. Fowler, engineer for the sewage scheme, had not been able to give the committee information on the point.—Councillor J. Williamson said that Mr. Smith had tendered previously for works of bridge building in the borough and other work, had worked on the Salford great sewer, of which Mr. Fowler was engineer, and had with a partner constructed the Deansgate portion of the Manchester

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sewer for a distance of $4\frac{1}{2}$ miles.—On the other side, members doubted if Mr. Smith had carried out the works in question as principal, and after a lengthy and warm discussion an amendment was carried by a large majority ordering inquiry to be made as to the works previously carried out by Mr. Smith, and as to other matters bearing upon the contract. The inquiries having resulted satisfactorily, Mr. Smith's tender is recommended for acceptance.

DECAY OF STONE IN ARBROATH.

At the last meeting of the Arbroath Natural History Society the Rev. James Thomson gave the opening address. In it he spoke about the durability of stone used for building and monumental purposes. Much ignorance, he said, prevailed on this subject. Some of our finest structures in Arbroath, like the Royal and Commercial Banks, of recent erection, had already suffered marked decay. A careful examination of the state of preservation of the stone in buildings of known age should be made and tabulated, and a list, showing the rate at which each kind decays, and the quarry from which it was taken, would be of immense advantage to architects and builders. A large number of beautiful marble monuments had recently been erected in their cemetery. When first set up the snowy whiteness of the stone made them the most attractive memorials of the dead. But what of their durability? A little observation showed that marble slabs soon became darker in hue. Those set up not more than twelve years ago were distinctly weather-worn and greyish in colour. Let anyone saunter through the Abbey burying-ground, and they would find that marble slabs, dating from the middle of this century, were hardly legible. Those over fifty years of age were in an advanced state of decay. The oldest he had noticed, built into the south wall of the choir, was sadly rent and dilapidated. Yet it only dated from 1817. A white marble statue of the Queen in Aberdeen, after fifteen years' exposure, had been removed to the hall of the Town House, as it was in danger of going to pieces. The strikingly beautiful Virgin Martyrs' monument at Stirling had to be protected by a glass dome. Marble is very porous, and the pores by absorbing water, which expands by frost, lead to the rapid break up of its crystalline parts. Then the merest touch causes them to crumble into loose sand. Besides frost, the disintegration of marble is largely due to the action of carbonic acid in the pervading rain water, whereby the component granules are dissolved. The rate

of decay is somewhat more rapid in towns where there is an excess of carbonic acid in the smoky atmosphere. Mr. Thomson said he never visited their fine cemetery without being vexed at seeing the rapidly increasing number of beautiful monuments in marble—memorials the purest and the chastest that love and art could furnish—because he knew that however exquisitely graceful they were now in their lustrous whiteness—instead of being the enduring mementoes they are meant to be, the time was not far distant when those very stones would become monuments of decay. He strongly recommended their removal to the interior of churches, where they would remain things of beauty for untold centuries. He next touched on the weather-resisting qualities of sandstone, pointing out that as a general rule grey varieties stood better than the red.

TRADE IN ABERDEEN.

IN many branches of industry, says the *Scotsman*, Aberdeen has enjoyed a large amount of prosperity during the past year. In the building trade, for example, remarkable activity has been manifested, and, with a rapidly-growing population, the extension of the city in all directions has been proceeding at a marvellously accelerated pace. The erection of 184 new dwelling-houses was sanctioned at an estimated cost of 126,855*l.*; there were 34 alterations and additions to existing houses, at a cost of 6,418*l.*; 11 public buildings, including schools, costing 116,500*l.*; 54 new business premises, valued at 11,608*l.*; and 68 additions and alterations on business premises, costing 32,098*l.*—a total of 351, and value of 293,479*l.* In the previous year the number of new buildings was 228, and the cost 186,000*l.* These figures show an increase of 123 in the number of dwellings, and an increase in cost of 107,479*l.* Among the public buildings in progress or completed were the important Marischal College extensions, a new hospital for the Royal Lunatic Asylum, the Salvation Army Citadel in Castle Street, extensive additions to the City Epidemic Hospital, new police offices in Lodge Walk, offices for the Canadian Mortgage Company at the corner of Crown Street, a new block at the Royal Infirmary, head offices in Guild Street for the Great North of Scotland Railway Company, the Grand Hotel in Union Terrace, additions to the Incorporated Trades Hall, churches for the Free Holborn and Baptist congregations, a new public school at Broomhill, and others. The granite industry, of course one of the staple

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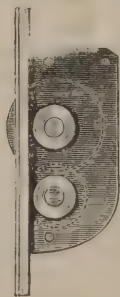
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employments in the "Granite City," has fluctuated considerably. The export trade has become very much restricted during the last three months, and complaints are heard of the unremunerative prices, mainly on account of financial troubles in America and the colonies. On the whole, however, the home stone-cutting and monumental trade has been fairly good, and as some large commissions are in hand it is hoped that the temporary dullness will not be severely felt. Messrs. Alexander Macdonald & Co., the old-established granite workers, report a fairly busy twelvemonth, and that the output from the quarries was much the same as last year. Some fine columns and pilasters for interior and exterior decoration were sent to England, and a large number of red granite columns were executed for a new Roman Catholic Cathedral in Melbourne. Among other commissions they have done work for Her Majesty the Queen, and carved numerous Celtic crosses, one of the latter having recently been erected in Paisley Cemetery to the memory of the late Mr. Barbour, M.P., while a drinking and monumental fountain was executed for Accrington. The commissions in hand include a pedestal for a statue (by Onslow Ford, R.A.) of the late Sir William Pearce, Bart., to be erected at Govan; a monument for the late Mr. Allan, of the Allan Line of steamers, and polished granite in columns, &c., for a new church at Omagh, Ireland. A memorial cross of Rubislaw granite, standing 18 feet high, and of carved Celtic design, has just been completed for a Clackmannanshire gentleman. Mr. Fyfe, of Kemnay's quarries, have also been kept very busy on account of the abundance of building jobs. Mr. Fyfe's contracts include the building of the Rutherglen Bridge over the Clyde, the viaduct in connection with the diversion of the North-Eastern Railway at Newcastle-on-Tyne, the viaduct at Bonar Bridge, the new Tower Bridge over the Thames and the works in connection with the Aviemore line. Messrs. A. & F. Manu-eile have had large demands upon their material, and Messrs. J. Wright & Sons have also had a very good year and have secured a number of contracts for granite fronts of buildings, among these being a polished frontage for the Equitable Assurance buildings in Manchester; for London and Welsh buildings in both red and grey granite; a front in the same material for a Dublin hotel and massive columns for Philadelphia. The Great North of Scotland Granite Company were busy with the frontage to three streets for the Oxford Street branch of the London and Westminster Bank, but otherwise work is reported dull. Where firms have experienced depression it is set down

to foreign competition and to the falling off in the American trade during the last few months. In granite paving setts there appears to be a downward tendency.

THE ARBITRATION CLAUSE IN AUSTRALIA.

IN Melbourne, before the Chief Justice, Mr. Justice Williams and Mr. Justice Hood, the Victorian Railway Commissioners moved to set aside an arbitration award given in favour of Messrs. Bloomfield Brothers, of Melbourne, in connection with their contract for the construction of a portion of the Camperdown to Terang and Warrnambool railway. The contract was entered into in the year 1887, and at the conclusion of the work, the Messrs. Bloomfield claimed a sum of 28,500*l.* for various extras and contingencies over and above the items allowed by the engineer-in-chief. The contractors demanded that the matter should be submitted to arbitration in the manner provided in the contract, and the department under protest nominated two out of the three arbitrators, intimating at the same time that if an award were made against it steps would be taken to have it set aside on the ground of illegality. The arbitrators were Messrs. E. G. Snowden, J. Reid and L. P. Maline, and after a prolonged investigation they awarded the Messrs. Bloomfield a total sum of 7,811*l.*, comprising a number of items which were set out in the award. The present motion to set aside the award was based on the grounds, among others, that the arbitrators exceeded their authority, as none of the claims contained in the request for arbitration were matters referable to arbitration; that the arbitrators were wrong in deciding that sleepers were "permanent-way material," and in finding, contrary to the engineer-in-chief's certificate, that matters which the engineer-in-chief had decided were contemplated or provided for in the contract were not such matters; that the finding by the engineer-in-chief that the several items were contemplated and provided for in the contract was conclusive, and could not be impeached except for fraud; that the arbitrators wrongly treated certain claims as claims for loss occasioned by the Department failing to provide permanent-way material; and generally, that the award as a whole was a nullity.

The Chief Justice, in delivering the judgment of the Court, said that in the case of this award the arbitrators had specified the items making up the award, so that it was possible to deal with them separately. The items were divisible into two

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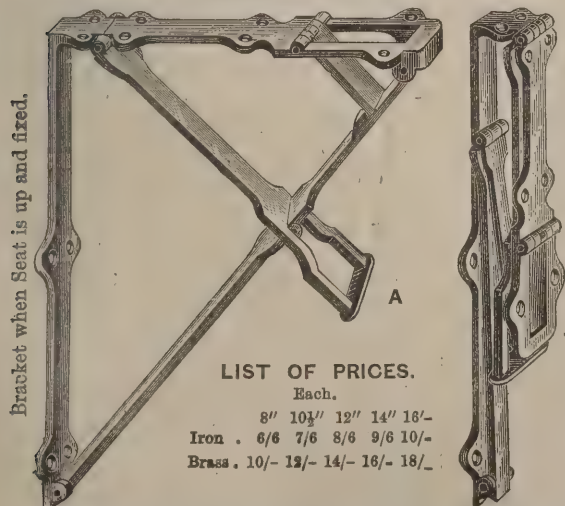
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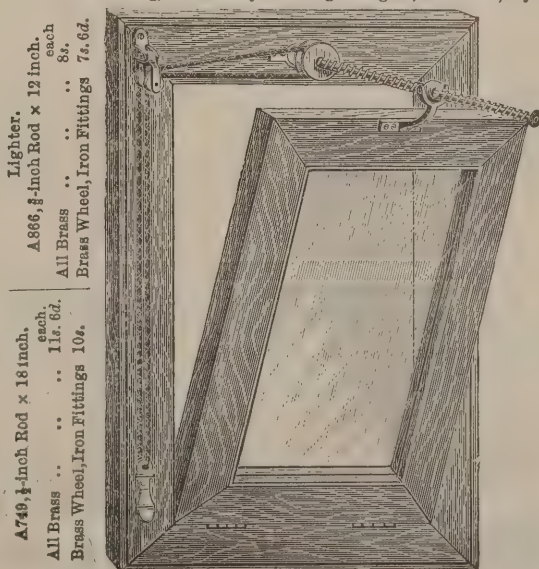
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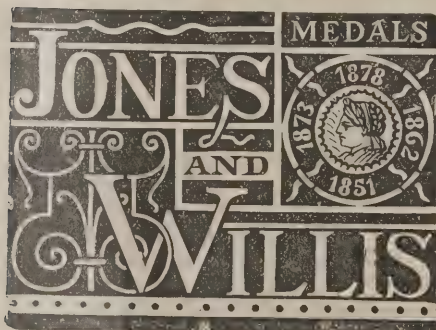
groups. In regard to the first group, the arbitrators found that they had jurisdiction to entertain them, as being claims respecting "extras, additions, enlargements, deviations, alterations or substitutions executed by the contractor, which in the opinion of the engineer-in-chief are not contemplated or provided for in the contract." Their finding on that point was at direct variance with the engineer-in-chief's own statement and certificate, which asserted that he had already dealt with them, and that in his opinion they were contemplated or provided for in the contract, and therefore not referable. Under Clause 87 of the contract, that opinion so expressed by the engineer-in-chief was an absolute prohibition of any appeal to arbitration on those items. It was contended, however, that if it could be shown that the engineer-in-chief could not properly have entertained such an opinion, the items could be treated as coming within the terms of clause 87. The Court was of opinion that this view could not be sustained. It was said that if the engineer-in-chief expressed an opinion one way it might be shown that his real opinion must have been the other way. That raised a very difficult question, but it was not necessary to decide it at present, because it seemed clear enough in this case that the engineer-in-chief had expressed his opinion, and there was no evidence at all sufficient to warrant the conclusion that this was not his opinion. The Court thought, therefore, that the arbitrators could not give themselves jurisdiction by finding specially what they had found under the circumstances of this case and the items depending on that point would be disallowed. The remaining items depended on another matter. Under the contract the Commissioners undertook to provide half the sleepers required, and after the contract was commenced they decided not to do so. This involved delay, and among other things compelled the contractors to incur haulage expenses to a greater extent than would otherwise have been the case. It was therefore said that the contractors had a claim against the department for loss occasioned by its failure to provide permanent way material, in which case the matter was properly referable to arbitration. As against this it was urged first that sleepers were not permanent-way material. If the sleepers might be permanent-way material, the arbitrators would have jurisdiction to decide whether they were so in fact. The Court considered that it was open to the arbitrators to consider that point, and having decided that under this contract sleepers were permanent-way material, they had jurisdiction to go on. The further argument that this item was covered by the general claim for haulage, which was not referable as such, appeared

also to be untenable. The result was that as to the items under this head the arbitrators had jurisdiction, and could then go as far as they liked. The law was that when parties chose to submit their disputes to a domestic forum, comprised of men of common sense, or in other words of men who had no special training for the work, once the arbitrators had jurisdiction they could go to any length. These items would therefore be allowed, and the award stood as to them. As the Commissioners had failed as to part, and that by far the greater part, of the award, there would be no order as to costs.

The items allowed amount to 6,388 $\frac{1}{2}$., and those disallowed to 1,423 $\frac{1}{2}$.. Of the expenses of the arbitration, two-thirds are borne by the department and one-third by the contractors. The total amount of these expenses was not stated, but the fees of the arbitrators alone were 1,500 $\frac{1}{2}$..

BUILDING IN EDINBURGH.

THE past year has witnessed no remarkable development of the Edinburgh building trade, says the *Glasgow Herald*, nor, on the other hand, has any evidence of decline on the average of the previous few years been noticeable. In one respect—namely, the construction of large public buildings—there has been a falling off. The McEwan Hall is still unfinished and the Observatory on Blackford Hill will not be completed for a considerable time, but these are the only two really important works of the kind in the city. The approaching year, however, may see some welcome additions. The Town Council have for a long time past been considering the project of a new fever hospital, for which an estimated cost of 40,000 $\frac{1}{2}$.. has been made, while, as is well known, the managers of the Royal Infirmary have decided on an extension, for which only the funds are needed. The city improvement scheme, too, which has been promoted in Parliament, will doubtless operate with considerable benefit to the building community. In connection with this municipal plan for dealing with slum localities, attention may be directed to the private endeavour, in which Professor Geddes has taken a leading part, to provide model dwellings in a prominent quarter of the city. The site chosen is at the north-eastern corner of the Castle Esplanade, from which a magnificent view is commanded, and here a fine building is in course of completion which internally is all that science and sanitation could demand. During the year, too, some of the old rookeries in the Lawnmarket have disappeared to give place to dwellings with a somewhat quaint and old-world exterior, but quite up to



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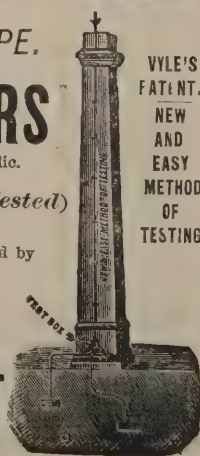
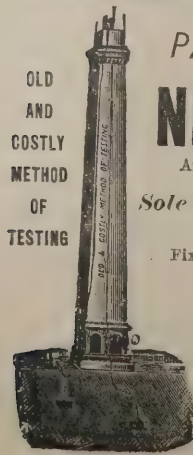
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modern requirements within. If construction on a large scale has not been remarkable in 1893, there has been more than the average number of additions to the housing accommodation of the city. Encroachments on the pleasant country lying to the south have gone steadily on, and especially in the Morningside and Newington suburbs. The returns of the Dean of Guild Court show that during the year new dwelling-houses have been erected at the rate, roughly speaking, of forty-three per month, provision having thus been made for an increase in population of about 2,500. The average in 1892 was thirty-eight per month. A year remarkable for strikes has not passed without a local dispute between the masons and their employers; but probably the most unfortunate result of this dispute was not the influence it had on wages, but the abandonment by the masters of the conciliation board which had been established. In 1892 the standard rate was 8½d. per hour; this year it was reduced to 8¼d., but the reduction has not been universally adopted, and the standard of pay has practically been that of the previous year. Plasterers have had steady employment at 8d., a figure, however, which in occasional times of briskness has risen to 9d.; while the joiners' standard of 7½d. has remained unchanged, plumbers' wages having remained at a farthing less. In the early part of the year signs of a rupture between house painters and decorators and their masters were visible, but fortunately the dispute did not reach serious dimensions, and in the busy season which ensued the men were content to accept the standard of 7½d. prevailing in the trade. The report of Mr. Dowell, auctioneer, on the Edinburgh property market for 1893 states that at his premises "there has been a fair amount of business done in property at 18 George Street during 1893. There was 10 per cent. less city property exposed, and 25 per cent. more sold, compared with 1892. In landed estates there were fifty-three exposed, aggregating 919,200l., of which sixteen were sold, realising 218,042l., with only an increase of 4,692l. above the upsets. The advertised property in the market is rather less than at this period last year; there are fewer first-class mansions, but still a superabundance of tenements; the prices asked for which in some cases are not such as are likely to induce competition. Well-secured feu duties are always in demand, and have maintained their price, the average for the year being 25½ years' purchase. As a result of the financial crisis in Australia and America, we may expect home heritages to return to favour as investments. On the whole there is more hopeful feeling."

BUILDING IN LEEDS.

DURING the earlier part of the past year, says the *Leeds Mercury*, the building trade was in a fairly active state. In anticipation of the coal dispute, however, business dropped off and, in common with other trades, while it lasted the industry became completely paralysed. The manufacture of bricks and other building materials requiring fuel was almost suspended, and there is no doubt that it will take a considerable time for the trade to recover from the effects of this disastrous industrial struggle. Wages during the year have not undergone any alteration, and it is pleasing to note that there has been no labour dispute of any description. There have not been many public buildings undertaken and completed, but the following may be taken as a fair sample of those in course of erection:—St. Chad's Home for Waifs and Strays at Headingley; Yorkshire Penny Bank in Infirmary Street; and the new post-office, in the latter of which much better progress has been made than what was shown in the earlier stages of the work; and the Yorkshire College extensions, which are nearing completion, will no doubt be opened in the coming spring. The splendid pile of offices for the Prudential Assurance Company in Park Row have been opened during the year, and fine shop premises and offices have been erected at the corner of Park Row for Messrs. Peacock, carpet, &c., merchants. In connection with the insurance world we might also mention the new offices being erected in East Parade for the British Law Fire office from the designs of Messrs. Ambler & Bowman, architects; also the large extensions and alterations that are taking place for the Sun Fire office in the premises at present occupied by the Atlas and Lancashire Insurance Companies in Park Row. The Cavalry Barracks in Chapeltown Road are at present in the hands of the builders. New officers' quarters are being erected and the old barracks entirely reconstructed. Two new Board schools are in course of construction, one in Darley Street and the other in Hunslet Lane. In Albion Street the Co-operative Society are putting up a fine pile of buildings on the opposite side of the street to the present premises. St. Aidan's new church, in Roundhay Road, is making headway; a new chapel is being erected in Meanwood Road, and also one in Clark Lane. The Midland Railway Company have erected new waggon sheds at Stourton, and the North-Eastern Railway Company have built new stables at the

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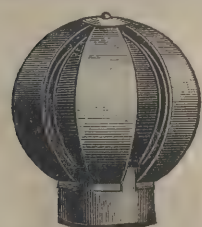
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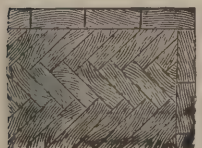
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top of Railway Street, Marsh Lane. The avenues in the fruit market have been roofed over, and the fish market has been extended. A small-pox hospital and sanatorium have been built at Manston, and the Canon Jackson memorial wing is being added to Cookridge Convalescent Home. In addition to these public works a very large amount of residential property has been put up on the outskirts of the city, chiefly suitable for the artisan class, which appears to let very quickly. Very few expensive residences, or the better class of villa houses, have been erected, although mention might be made of those on the Newton Park Estate for Mr. Lupton, also in Wesley Road, Armley, and on the Cowper Estate in Chapel-town Road and at Roundhay and adjoining Roundhay Road. In reference to the coming year, we are afraid there will be a considerable falling-off in building operations, as the price of materials, owing to the excessive cost of fuel, will preclude to a large extent speculative work being carried on with much prospect of an adequate return for the outlay. New baths are about to be erected for the Corporation in Kirkstall Road and on the side of the old "Midden," near the Covered Market, and it is likely that a large fever hospital will be erected on the Manston estate. We presume the Hunslet railway scheme will go on almost immediately, and this, with the North-Eastern Railway extensions, also the extension of the tramways into other districts, will no doubt greatly influence building operations in the future.

PUBLIC WORKS IN MANCHESTER.

MANCHESTER to-day, says the *Manchester Guardian* of the 1st inst., will be a city of one idea. She will open her gates for the first time to welcome a ship from over sea, and her citizens can scarcely be expected, for this day at least, to think of anything else but the wonderful transformation which has given an inland town a place in the list of English seaports. The magnitude of the achievement throws into comparative shadow several other schemes of civic enterprise which had they stood alone would in themselves have marked the year 1894 as an epoch in municipal history. It may be well therefore at this season to emphasise their importance, lest our neighbours and visitors should receive the impression that the energies of Manchester have been solely concentrated upon one colossal effort. Those who doubt the recent activity of the Corporation in public works have only to refer to the eloquent testimony of

pounds, shillings and pence to be startled into immediate conviction. Selecting five great schemes either just completed or on the verge of realisation, we find ourselves faced by a total expenditure of nearly four millions. Of this amount the Thirlmere water scheme alone, so far as it has gone, claims five-eighths. The drainage system of the city has been remodelled at a cost of 600,000*l.*; rather more than 500,000*l.* has been, or will be, spent on extensions in the different gasworks; the municipal electric-light installation is responsible for an expenditure which will soon reach 150,000*l.*, and the project of supplying hydraulic power to firms within the city means an outlay of 100,000*l.* None of these is an insignificant undertaking, but that which relates to the water-supply is of pre-eminent importance. The day which sees the city supplied for the first time with water from distant Thirlmere will be only less notable in the municipal calendar than the 1st of January, 1894.

Within the next six months our water-supply will have been placed upon an inexhaustible basis. As the community has grown we have had to go further and further afield to secure an ample provision of this prime necessity of life, but we may now rest assured that our foraging days are done. Three hundred years ago Manchester had no occasion to stir abroad for water. The inhabitants derived their chief supply from a well in Fountain Street, and our ancestors filled their pails at a public conduit the site of which is now covered by the Royal Exchange. The conduit was fed by stone pipes from Fountain Street, from the Shudehill pits, and from the ponds near the site of the present Royal Infirmary. At a later period the town brought its water from Gorton and from the canal at Peak Forest, supplementing the supply with water pumped from the unpolluted Medlock. Eventually the Corporation seized upon Longdendale, dammed up the river Etherow into reservoirs, submerged a village or two, and rested. In 1885 Manchester and the district were satisfied with 8,000,000 gallons per day. With a population of a million within the area of supply, we now require a daily delivery of 24,000,000 gallons. Longdendale has never failed us so long as there has been an average rainfall, but in periods of drought the city has again and again been thrown into a state of mild panic at the prospect of a water famine. Thirlmere will save us from all such apprehensions in future. The proud place which the district holds in the rainfall returns commends it to the water-works engineer if not to the tourist. At Longdendale the average yearly rainfall is a mere 50 inches. Thirlmere doubles that quantity, and adds 4 inches to the bargain. There are no

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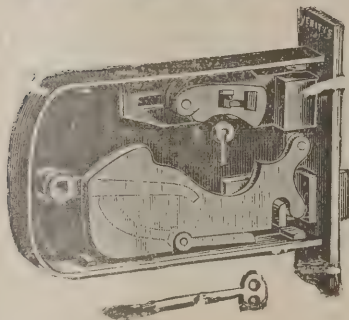
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LETTER FROM "THE TIMES."

"CASSELL & COMPANY (Limited) write to us, under date November 16, as follows:—'Will you kindly allow us to state that the fire which took place in Fleet Lane last night, and by which a portion of our premises was damaged, will not in any way interfere with the punctual issue of our magazines, periodicals and books? All our monthly magazines for December will be issued at the usual date, and our weekly periodicals, *Cassell's Saturday Journal*, *Chums*, and *Cottage Gardening*, at the ordinary time next week. This week's issue of *Work* and of the *Speaker* may be an hour or two late; but full editions have been prepared, and will be obtainable in the ordinary course. We should like to add, for the information of your readers in general, and of those interested in insurance matters in particular, that the system known as GRINNELL'S AUTOMATIC SPRINKLERS, which we adopted some years ago as a protection against fire, acted admirably on this the first occasion on which it has been practically tested, and undoubtedly did much to save our buildings from serious damage by fire.'

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springs at Thirlmere as at Longdendale. They will never be missed. The moment the water comes down it rushes along the hard, impervious rock straight into the reservoir. When the lake is full to the level to which it is being raised by an embankment now almost completed, we shall be able to rely upon Thirlmere for a supply of 50,000,000 gallons per day for 150 days, even in periods of the greatest drought. The great aqueduct by which this volume of water may be carried through hill and over dale for a distance of 95 miles is finished. It is the longest channel of the kind that the world has seen. The greatest of the Roman aqueducts, the Anio Novus, constructed in the time of Claudius, was only 62 miles long, but it held the "record" until Liverpool went to the Vyrnwy and brought water from Wales through tunnels, pipes and syphons over a distance of 75 miles. Manchester has now beaten both Rome and Liverpool.

Generations hence the Thirlmere aqueduct will perhaps have its full complement of five iron conduits, each capable of conveying 10,000,000 gallons per day, but at present only one of those pipes has been laid down, and the necessity of a second is not likely to be realised for twenty years. The aqueduct commences at the south-east corner of the lake, and at such a level that the surface of the water running into it at the entrance will be about 531 feet above Ordnance datum. The water will be delivered into the Prestwich service reservoir at a height of 353 feet, and will therefore have a fall in the length of 178 feet. In the first 22 miles of the aqueduct there are 17 tunnels, having an aggregate length of 14,000 yards, and 7 syphons, with an aggregate length of 9,000 yards, the remaining 15,700 yards consisting of "cut and cover." The greatest length of a single tunnel is 5,225 yards, and the greatest depth 660 feet. Progress at Thirlmere has been somewhat retarded owing to an engineering difficulty which arose some time ago in the construction of the embankment at the northern extremity of the lake. A fault in the rock necessitated the excavation of 11,000 cubic yards of stone out of a narrow gorge, which had afterwards to be filled in with an equal proportion of concrete, in order that the engineer might go 50 feet lower than was originally intended for a secure foundation. Should the winter continue favourable we may expect to see the work so far completed as to put us in possession of a daily supply of 10,000,000 gallons in the course of the next few months. The scheme will then be about fifteen years old, for, although the works were not commenced till 1885 the Act of Parliament was passed as long ago as 1879, and it will then, as we have

indicated, have cost about 2,500,000/. Each additional 10,000,000 gallons per day will entail a further expenditure of 500,000/., so that the cost of the scheme when it is actually finished at some far distant date will have reached a total of about 4,500,000/. This is a big amount, but it falls considerably short of a certain estimate referred to by Sir John Harwood in his "History and Description of the Thirlmere Water Scheme." Sir John tells us that on one occasion when the committee were visiting the works they were privileged to overhear a conversation between a countryman and a stone-breaker. The stone-breaker said to his companion, "Thoo sees that man theear wid' white heid?" (pointing to the late Mr. Alderman Grave). "Yis," replied the other. "Well," continued the stone-breaker, "he's gitten 't intul his heid to tak' watter oot o' t' lake fra here ta Manchester;" upon which the man laughed and said, "What! Theear's nut munny aneuf in aw t' world as wad deuh 't."

The hydraulic power sub-committee do not intend to wait for the new water supply, but promise to place their installation at the service of warehouse tenants on the 1st of next month. The engine-station is nearly completed, and most of the piping has been laid down in the area of supply, which includes Portland Street, Deansgate, Quay Street and Corporation Street. About 1,000 lbs. pressure to the square inch will be obtained at the central station, and this force will be tripled by intensifiers placed in the premises of customers. The committee are in possession of land sufficient to enable them when necessary to build two more stations, and they have already decided to extend the original scheme, under which about ten miles of piping have already been laid down. The water supplied under hydraulic pressure will be taken from the city mains, and therefore will be exceptionally pure, which will clearly be to the benefit of the consumer's machinery. Pressure of 1,000 lbs. to the square inch is 33 per cent. above usual practice, while it is fourteen to twenty times greater than the pressure in the ordinary mains, which in many cases is found efficient. One thousand gallons of hydraulic water will thus be worth fourteen to twenty times the value of the ordinary water supply for such purposes. Another novelty in municipal enterprise—novel only, however, in relation to Manchester—is the electric-light installation, which has done so much to brighten the shop windows in the murky streets of the city within the last two months. The system was fully described in these columns at a recent date, and it is only necessary now to add that the number of applications for a supply

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of the light has been so enormous that the committee will probably have to extend their plant in the course of the winter. The original capital of 100,000*l.* which was devoted to the scheme has been drawn upon to the extent of 70,000*l.*, but it is the intention of the Corporation to set aside an additional sum to be applied to the further development of so successful an enterprise. The installation has been in full use since last September. In July a temporary two-wire arrangement was brought into operation from the station in Dickinson Street, and had continued for about three months when, by a remarkable feat in electrical engineering, it was replaced within the space of a few hours by the five-wire system, which will now continue in permanent use. The outer boundaries of the square within which mains have been laid comprise Deansgate, Peter Street, a portion of Oxford Street, Portland Street, Piccadilly and Market Street. Eventually, if one may judge by the map on which the prospective lines of the electrical current are traced, this square may be expected to extend its four sides so as to enclose all the most important business thoroughfares in Manchester.

Electricity, however, is not going quite to kill gas as a means of illumination in the city. At present our gas supply cannot be said to give universal satisfaction. The Corporation obtained power during last year to borrow 500,000*l.* for gasworks purposes, and the money is being spent. At Bradford Road, we are informed, the manufacturing and purifying plant has been practically doubled during the last eighteen months. The storage capacity is equal to 6,000,000 cubic feet of gas at present, but a new holder is in course of erection which will store 7,000,000 cubic feet. Stoking machinery on the West pneumatic principle has also been introduced, and is working most satisfactorily. At Rochdale Road the efficiency of production has been improved by the reconstruction of the retorts in one house, and at Gaythorn a new gasholder to contain about 1,500,000 cubic feet of gas would have been quite complete by this time had it not been for a slight leakage of water which has had to be remedied. A holder to contain 525,000 cubic feet has been erected at Droylsden, where new retorts on the sloping principle are now in satisfactory operation. Altogether the capacity of storage will be increased during this year from its present limit of 18,000,000 cubic feet to 25,000,000 cubic feet. Including the works mentioned, it is proposed during the next eight or ten years to expend on Bradford Road works 135,000*l.*; on Gaythorn, 35,000*l.*; on Rochdale Road, 50,000*l.*;

on Droylsden, 17,000*l.*; on street mains, 200,000*l.*, at the rate of 20,000*l.* a year for ten years; on meters and stoves, 50,000*l.*; and on miscellaneous work, 15,000*l.*, bringing the total up to 502,000*l.* These are figures suggestive of enterprise, if not of severe economy, and they represent an extraordinary growth in the manufacture and distribution of gas in the city. From the very inception of the process, however, Manchester has taken a prominent part in its development. Salford, significantly enough (as Mr. Southern might say), was first in the field. It was in 1805 that the first building in the borough was lighted with gas, but only two years later the Police Commissioners of Manchester boldly affixed a public lamp opposite their premises in Police Street. In 1824 Manchester found itself in the position of being the first municipal authority to obtain powers for the manufacture and supply of gas—an enterprise which now yields a yearly revenue to the Corporation of more than half a million. Any review, however hurried, of public improvements in Manchester in 1893-94 would be incomplete without a reference to the great scheme of main drainage which has converted Manchester into what sanitary engineers call a "water-carriage" city. The aim of Mr. Allison, the city surveyor, was to obviate in any part of his design the necessity of pumping. In this he has been successful. The whole drainage of the extended city will eventually be directed by gravitation to the outfall works at Davyhulme. Originally the cost of this laborious undertaking was estimated at 500,000*l.*, but the addition of several townships to the city has extended the field of operation and increased the cost by about 100,000*l.*

Before the new year has run its course the map of Manchester will call for considerable modification. Broader lines will have to be cut through some of the square masses which indicate the denser centres of business population. Between the Ship Canal Docks at Pomona and the principal highways leading north, south and east, wider channels are about to be opened for the volume of traffic which is expected to follow the event of to-day. Whitworth Street, which will provide a broad thoroughfare between Oxford Street, London Road and the Openshaw district, will be completed early in the year; and the Corporation has obtained Parliamentary powers to continue the artery in the opposite direction by widening Gloucester Street, South Junction Street and Gaythorn Street as far as Chester Road. Chester Road, being of sufficient width as it stands, forms a link between Gaythorn Street and Hulme Hall Road, where the work of extension will be taken up and continued to the canal. Cornbrook Road is also to be widened,

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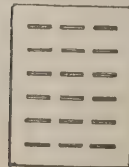
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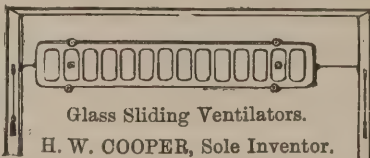
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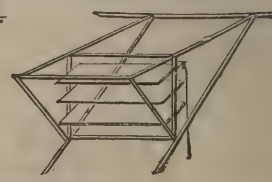
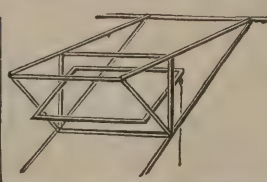
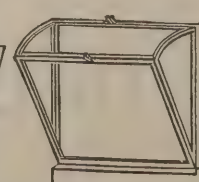
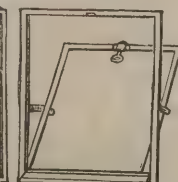
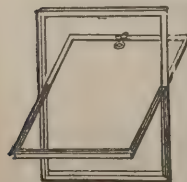
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and these alterations will necessitate the reconstruction of a viaduct over the Bridgewater Canal. Railway extension in the neighbourhood of Victoria Station is leading to further street improvements, which will greatly relieve the congested thoroughfare of Rochdale Road. Shudehill from Hanover Street to Miller Street will be widened to an average of 20 yards, while Miller Street will attain an average width of 16 yards between Charter Street and Beswick Street. In the course of the year the Corporation will apply for Parliamentary powers to carry out the important scheme which has been formulated for adding to the public highways a portion of the enclosed ground surrounding the Manchester Cathedral. From the ornamental point of view this promises to be the greatest improvement of all. The cathedral, although hemmed in rather narrowly by a new and, it is to be hoped, a better-looking boundary wall, will impend with greater prominence upon a spacious thoroughfare, with the result, if anticipation is realised, that both street and building will gain in dignity. New edifices are rising in every district of Manchester to testify to the vitality of the community. One of the most interesting is the strong-walled structure of ecclesiastical aspect which is slowly rearing its deeply-recessed arches on one of the most prosaic sites in Deansgate. A kind of mystery which attaches to the building is deepened by the circumstance that most of the splendid masonry is darkened on either side by the opposing walls of two of the most insignificant lanes in the city. The building is, however, to be dedicated to a noble use. It is destined to be the home of the Althorp Library, which Mrs. John Rylands is bringing to Manchester as a monument to her late husband. Progress will no doubt be made during the year with the new technical school building which is about to be erected in Sackville Street at an estimated cost of 85,000*l.*, and we may almost take it for granted that before the year closes Manchester will be possessed of one of the finest medical schools in the country, in the new buildings which the Council of Owens College are erecting at Lloyd Street.

BUILDING IN GLASGOW.

ACCORDING to the *Glasgow Herald* the building activity of 1892 was fully maintained during 1893. The low rate of interest prevailing for money and the lack of safe investments has favoured the property market. The long spell of inaction that followed the speculative mania of 1872-76 caused the natural growth of the population to overtake the house

accommodation. The speculative builder is therefore once more in the field, and covering it—north, south, east and west—with a rapidity that is truly astonishing. The total number of new linings that have passed through the Dean of Guild Court during the past year numbers 542, and the valuation of these amounts to no less than 1,284,670*l.* It may be interesting to note that the greatest number of houses passed were those of two apartments, the number being 1,462, against 441 houses of one apartment. It is also satisfactory to know that houses of three apartments are in demand and that there have been passed 774 of these; while four, five and six apartment houses have only been increased during the year by 154, 54 and 77 respectively. We have added nine new public buildings valued at 58,000*l.* Churches, schools and halls amount to the respectable total of 101,900*l.* The most important structures of all, and those which to a large extent make the demand for the others, are the large additions which have been made during the year to our warehouses, stores and workshops. One hundred and five of these have been granted, the cost of which is estimated at 471,690*l.* The old saying still holds good that "One man builds up and another pulls down." Alterations and additions figure in the records of the court to the tune of 80,900*l.* In addition to this, public works such as the Central Railway with its connecting lines, the subway, the sewage works, the new docks at Cessnock, all tend to make labourers scarce, masons and bricklayers especially. Their wages have never been as high in this part of the country as now. Joiners have been more easily obtained, the unfortunate strike on the Clyde and the general depression in shipbuilding throwing a large number of them into the building trade. Plumbers still continue brisk—thanks to the Health Committee, who are still pursuing their water-closet reform with vigour. The other departments of the trade share the general prosperity and the outlook for the coming year is certainly good.

THE MASTER WRIGHT AND THE ARCHITECT.

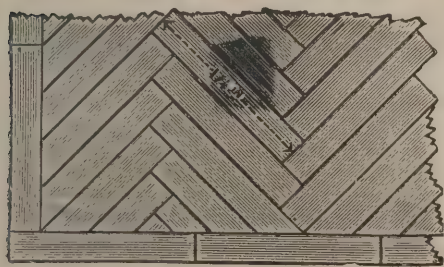
AN address was delivered by Mr. William Forrest Salmon, president of the Glasgow Institute of Architects, at the quarterly meeting of the Glasgow Master Wrights' Association. He said: Since agreeing to take the opportunity which you so kindly afforded me of addressing you, a few thoughts have occurred to me in regard to the relationship of the master wright to the architect, and these I will try to put before you as clearly as possible. I will speak, first, "Of the affinity of the master

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wright with the architect"; second, "Of man's earliest efforts at building"; third, "Of the evolution of architecture"; and fourth, "Of the aims of the architect and the builders."

It will be readily acknowledged by you that a close affinity exists between the architect and the master wright. An architect here and there may be possessed of so much practical knowledge that without the aid of a master craftsman he can select material and direct workmen; but, as a general rule, an architect has not so much knowledge, and even if he had, experience has proved that it is not the best way for him to use his talents. It is the universal practice now for architects to employ their gifts in designing, preparing working drawings, choosing materials and supervising their works. The architect's duties are thus confined within certain clearly-defined boundaries. Outside of these boundaries lie vast fields of work in which other men must labour before any building can be erected. There may be as many as fifteen or twenty different crafts engaged in one building alone, and over each of these there must be a wise, experienced and responsible head. One of these (and in many buildings the chief one) is the master wright, and it is about him that we are concerned to-night. If a building is to be successfully carried out the master wright must bear a very important share in the responsibility. A building may be very carefully designed and most carelessly put together. The knowledge, the experience and the judgment of the master wright must be exercised. We architects know this, and we take care to select master wrights in whom we can place reliance.

I am quite sure that you could tell me far more than I can tell you of the knowledge required, and the time taken up, and the labour entailed in the acquisition and selection of suitable timber for the several sections of the work, in the cutting of it so as to turn it to profitable account, in the choice of men for the different parts of the work, and in the setting out of work for the different men. In these, and in many other ways, your work and the architect's work lie side by side. A mutual helpfulness is demanded in order to secure a satisfactory result. Your interests and the architect's are common. To thwart the architect would be derogatory to your own interests, for you take much trouble with the buildings on which you are employed, and devote the best energies of your short life to this work. You naturally take a pride in your own productions, and we architects ought to make you recognise that the work you do is the result of your own skill and devotion. It may gratify you to know what is a fact, that

when an architect visits a fellow-architect's building, an almost invariable question is, Who was the mason and who was the joiner? More particularly is this question put when the work is good, and the architects praise the good tradesmen without stint. I have thus shown very clearly that the master wright is in close affinity with the architect, and it is in the interests of good architecture to make not only the master wright but the master in each trade conscious that he has a large share of the work and the responsibility, and that each piece of work he does will be to his credit or to his discredit. We are all fellow-workers, and architecture is the result of our joint labours.

I have spoken of the present close affinity that exists between master wrights and architects, and I should like now to refer to their historical affinity. Man in his earliest efforts at building took the material which was most easily procured, viz. the timber of the mighty and dense forests which lay around him. No doubt primæval man took shelter in caves and even formed caves in the earth and built mud huts, but the earliest efforts at serious and skilful construction were with timber, where such could be procured. The door-posts and lintels, the roof carried on the upright walls, the framing of several timbers together so as to support one another, demanded careful consideration and invention. Man was compelled thus to design, and the first start was made in architecture. I am not sure that Mr. Ruskin would quite agree with me in this statement. In his "Seven Lamps of Architecture," he says:—"Architecture is the art which so disposes and adorns the edifices raised by man for whatsoever uses, that the sight of them may contribute to his mental health, power and pleasure." This general statement of Mr. Ruskin's is very good, but he goes on to enlarge upon it as follows:—"It is very necessary in the outset of all inquiry to distinguish carefully between architecture and building. To build—literally to confirm—is by common understanding to put together and adjust the several pieces of any edifice or receptacle of a considerable size. Thus we have church-building, house-building, ship-building and coach-building. That one edifice stands, another floats and another is suspended on iron springs, makes no difference in the nature of the art, if so it may be called, of building or edification. The persons who profess that art are severally builders, ecclesiastical, naval, or whatever other name their work may justify; but building does not become architecture merely by the stability of what it erects; and it is no more architecture which raises a church or which

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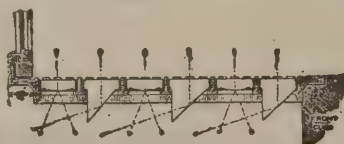


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fits it to receive and contain with comfort a required number of persons occupied in certain religious offices than it is architecture which makes a carriage commodious or a ship swift. I do not, of course, mean that the word is not often or even may not be legitimately applied in a sense, as we speak of 'naval architecture'; but in that sense architecture ceases to be one of the fine arts, and it is therefore better not to run the risk by loose nomenclature of the confusion which would arise, and has often arisen, from extending principles which belong altogether to building into the sphere of architecture proper." Mr. Ruskin is endeavouring to guard the sacred term architecture from abuse, and I have no desire to nor would I contradict him. I would not have you imagine that every building is an architectural production. What I wish to show you is, that the early attempts at building were the first stages of architecture, not man's first attempts at architecture as that is understood now. My position is, that man's earliest efforts at building were the first steps which led him to discover the art of architecture which was as yet unrevealed.

Well, then, who made these first efforts? Who cut and shaped the timber and framed it together? Were they not your progenitors? Shall we call these designing men the master wrights of those days? During the early centuries of the Christian era, before the light of the Gospel was brought to the shores of Britain, many of the wild residents of this island built their dwellings in the lakes to protect themselves against sudden attack. These lake dwellings, or crannogs, were constructed of timber. There was one unearthed about twelve years ago at Mid-Buiston Farm, near Kilmaurs, in Ayrshire. I remember visiting it. The lake has disappeared, but the contour of the country shows where the lake was. A large part of a wooden platform, nearly circular, about sixty feet diameter, still exists, fixed partly to stakes driven into the mud and partly on a foundation of tree trunks laid together horizontally in courses, with brushwood between. Upon this platform the former dwelling or dwellings had been built. A number of flint implements, arrow and spear heads of metal, combs and other objects of bone, rings of gold, bronze objects and pottery were found. I am not sure where these are preserved, but if you take the trouble when next in Edinburgh to visit the Antiquarian Museum, you will see many such objects found at similar lake dwellings in Scotland.

The point I wish to enforce to-night is, that these structures were designed by master wrights, and that skill and designing power had to be exercised before they were erected. But not

only in this country were the busy and fruitful-brained master wrights at work, for in all countries the same thing was going on. Even to this day in barbarous and semi-barbarous countries, and in countries which new settlers are now possessing, the same process is going on. The master wright is the pioneer of the architect, and by-and-by he develops into the architect. The opinion might quite reasonably be held that the first men who thought of other materials, such as brick, stone, marble, &c., were the master wrights, and that from their ranks the earliest architects came. It is interesting to notice that in those early times, although there was no timidity shown in the employment of timber, brick and stone were used with great caution; the walls and pillars were made exceedingly massive, as if fear was entertained that wind or floods would carry them away unless they were enormously strong.

Perfect freedom and abandonment in stone construction was not indulged in until about the twelfth and thirteenth centuries of the Christian era—thousands of years after stone construction was first attempted. At that time those lovely cathedrals in France were erected, where grace and refinement were carried so far that there is no beyond to struggle for. Had mason-work developed first, man might have reached that refinement in stone building at an earlier date, but timber construction developed first, and the architects were for a very long time exceedingly timid in their use of the new and untried material. When certain building laws are agreed upon, or when a certain style of building is adopted, centuries pass before great changes are ventured upon, and no doubt we are greatly indebted for the changes and developments of the styles to the gradual discoveries which were made of the possibilities of the various materials which came to be used for building purposes.

I think I have succeeded in showing that the master wrights have had their share in the development of architecture, which in many ways is the greatest and most wonderful of all the arts. If you acknowledge and allow this, then I wish you to place yourselves in a position of responsibility. Your predecessors, if my historical ideas are correct, were the founders of architecture. Their early efforts marked the beginning of the art of building, and those with the sense of beauty more strongly developed marking how the sunlight scintillated on the projections and cast shadows under the eaves, and how the groups of buildings added a new beauty to the surroundings, strove to enhance the loveliness with added grace. Thus the art grew, and now it is so

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great, and the labourers in it are so numerous and so various, and their interests are so isolated, that grave dangers assail its fair fame. In the great struggle to keep architecture pure and free from blemishes you master wrights must bear a part. The architects have to prepare the designs and supply the drawings, but the masters in the different trades have to buy the materials, see that these are in proper condition, shape out the work and direct the workmen. Your work, then, is of high importance. You cannot too highly regard it, and it is the architect's duty to inspire every one engaged with him in the production of a building with the feeling that he is doing an important part of the work, and that to him will a share of the credit be due. To quote Ruskin again:—"There is no action so slight nor so mean but it may be done to a great purpose and ennobled, therefore, nor is any purpose so great but that slight action may help it." So, then, you master wrights and we architects are fellow-workers, and in our respective callings we ought "to provoke one another to love and to good works"—to love our art, and to efforts to produce good art. There always have been architects who have striven to do so, but there have been a great many who have failed completely, sometimes for lack of effort and sometimes for lack of ability.

At the present moment there exists a strong tendency to advance in architectural development. A spirit of dissatisfaction with the later productions is everywhere manifesting itself and a true appreciation of what architecture is appears to be taking possession of a thoughtful section of the public. Those practising architecture have become aware that it will not suffice to plan a building, and then clothe its nakedness in the architectural details of a Greek temple or a Gothic cathedral, but that each building must be a living expression of its own uses. If it is to exist as an abiding work of art it must tell its story not only to its own generation, but to the generations following. To be an architect in these circumstances is a difficult and hard thing, and if an architect's endeavours are in such directions he ought to be surrounded by master masons, master wrights and masters in all the various trades that will help him and not hinder him. That such masters are to be found we are well aware, but they are not so common as they should be, and since you have asked me to address you to-night from the architect's standpoint, I would have you take seriously into your consideration the situation as I have presented it to you. There are earnest, good architects, and there are earnest, good craftsmen. The good architects will, as a rule, get the good

work to do, and they will seek for the good craftsmen to carry it out. The architect and the craftsman have the same choice put before them. If they would be entrusted with good work they must show themselves worthy and fit for it. The aims of a good architect are to design his buildings appropriately and artistically, and to get them carried out by honest and skilful hands. The aims of a good craftsman are to carry out the work he undertakes with the best material and in the best manner. The work thus cut out for the architect is an arduous one that will tax his energies to the utmost, and the work for the craftsman is not less arduous. His knowledge of material must be thorough. He must devote careful attention to its selection. He must employ the best workmen. He must be so educated in architectural details as to be able to interpret and give expression to the architect's drawings. In this way the craftsman takes a high rank.

We architects begin to feel more and more that in order to produce architecture worthy of the name, we must not only have honest craftsmen, but art craftsmen. It is desirable for you master wrights and for your workmen to have art instincts and art knowledge. A man with an instinctive love of art will impart an added grace to the piece of work he produces, and this quality of beauty in it will appeal to the artistic and cultured mind. It is not only the great masses of a grand old building which command attention; the very chisel-marks often exhibit the workings of the devoted heart, the earnest soul, and call forth admiration. Let me counsel you, therefore, to seize every opportunity you have to enlarge your knowledge of art generally and of architecture particularly, and to encourage your workmen to do the same. It appears to me that the time when you might influence your workmen most successfully in this way is during their apprenticeship. I rather fear that during the five long years apprentices are kept pretty closely at their ordinary work from early morning till dewy eve, and that if any of them attend classes it is after their hard day's work is over, and independently of their masters. Would it not be well for you masters to consider in what way you could inspire higher thoughts in your workmen at this initial stage? They are then easily influenced by you, and if you drew up a curriculum they would no doubt be anxious to pass through it and learn as much as possible. At all events, the members of this association might take this suggestion into their serious consideration. We have an excellent art school in Glasgow which ought to be taken advantage of. The Institute of Architects is taking a deep interest in this school

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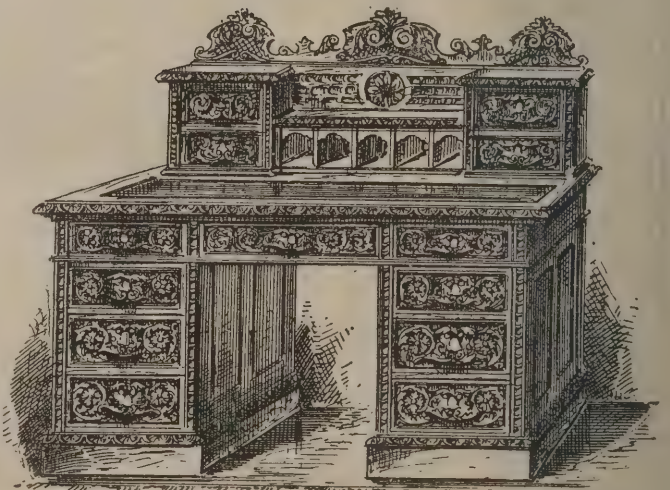
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and there are architects on the governing body whose influence is considerable in directing its affairs. We should like to see its classes filled to overflowing. We think the masters of all the building trades should encourage their apprentices and their workmen to attend the classes.

I feel sure that the master wright's success in the future, as well as an architect's, will turn largely on this very question of art. The craftsman who understands and appreciates art will come to the front, and the buildings which are artistic will live and be carefully preserved and handed down as treasures to the future generations. We will die and be forgotten, but our work, if it is worthy, will live. The care and thought of the architect will be ever manifest, and the labour and devotion of the craftsman will continue to tell its story. In one of Ruskin's eloquent passages, where he is defending richly ornamented buildings, he says:—"It is not less the boast of some styles that they can bear ornament than of others that they can do without it; but we do not often reflect that those very styles of so haughty simplicity owe part of their pleasurable contrast, and would be wearisome if universal. They are but the rests and monotonies of the art; it is to its far happier, far higher exultation that we owe those fair fronts of variegated mosaic, charged with wild fancies and dark hosts of imagery, thicker and quainter than ever filled the depth of midsummer dream; those vaulted gates trellised with close leaves; those window labyrinths of twisted tracery and starry light; those misty masses of multitudinous pinnacles and diadem tower, the only witnesses, perhaps, that remain to us of the faith and fear of nations. All else for which the builders sacrificed has passed away—all their living interests and aim and achievements. We know not for what they laboured, and we see no evidence of their reward. Victory, wealth, authority, happiness—all have departed, though bought by many a bitter sacrifice. But of them and their life and their toil upon the earth one reward, one evidence is left to us in those grey heaps of deep-wrought stone. They have taken with them to the grave their powers, their honours and their errors. But they have left us their adoration." But we must not be carried away altogether by the soul-stirring and loving language of this great writer, nor imagine that it is only in enduring works of architecture that man's labours are well spent, for every life that has been faithfully lived, every act of whatever sort that has been done in a true spirit, and every word that has been fitly spoken, has shed its light and stamped its truth upon our human race. There have not only been earnest and true labourers in the sphere of

architecture, but in every sphere which man has yet discovered. We rejoice, however, that there have been high-souled men in the ranks of architects and builders in the past, and it is for us so to act that we shall help forward the noble cause of truth and virtue. It matters not whether we be architects, master wrights, or workmen—

All service ranks the same with God,
With God whose puppets best and worst
Are we: there is no last nor first.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

24380. William Nicol, for "Improvements applicable to window-sashes."

24422. Edward Eugene Dulier, for "An improvement in apparatus for destroying smoke."

24447. Ernst Hohnbaum, for "Improvements in apparatus for indicating the levelness or extent of inclination of surfaces."

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EAST GRINSTEAD.—Jan. 31.—Designs are invited for an Isolation Hospital. Premium £5 5s. Mr. W. Alsten Head, Clerk to the Union Sanitary Authority.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb 28.—For Scheme of Water Supply and Sewerage. Premium of 40% is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150% and 50%, premium to merge. Mr. H. H. Hicknott, Town Clerk

RUNCORN.—Jan. 19.—For Water Supply Schemes. Premium of 5%. Mr. John Ashton, 71 High Street, Runcorn.

SOUTHEND-ON-SEA.—Jan. 31.—For Designs for Shelters, Sea-baths, Photographic Studio and Shops. Mr. W. Gregson, Town Clerk, Southend.

CONTRACTS OPEN.

BARNSTAPLE.—Jan. 13.—For Building Parish Rooms in Connection with Church of SS. Peter and Paul. Mr. W. C. Oliver, Architect, Bridge End, Barnstaple.

BARRY.—Jan. 17.—For Building Presbyterian Chapel. Mr. T. G. Williams, Architect, 3 Cable Street, Liverpool.

BLACKBURN.—Jan. 29.—For Building Pauper Lunatic Asylum. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BOWNESS.—Jan. 24.—For Building Residence. Mr. Stephen Shaw, Architect, Kendal.

CARISBROOKE.—Jan. 29.—For Building Boundary Walls for Extension of Cemetery. Mr. W. C. Way, Surveyor, Newport, Isle of Wight.

CHELMSFORD.—Jan. 16.—For Building Dwelling-house. Mr. Fred Chancellor, Architect, Chelmsford.

CHELTENHAM.—Jan. 23.—For Supplying Electric Lighting Machinery. Mr. Joseph Hall, C.E., Municipal Offices, Cheltenham.

CORK.—Jan. 16.—For Building Catholic Church. Mr. G. C. Ashlin, Architect, 3 Lower Merrion Street, Dublin.

CORK.—Jan. 29.—For Building Wesleyan Church and Sunday Schools at Barrackton. Mr. Robert Walker, Architect, 17 South Mall, Cork.

CRADLEY.—Feb. 9.—For Building Police Station, Cells, &c. Mr. Henry Rowe, County Surveyor, Worcester.

DEPTFORD.—Jan. 16.—For Supply of Materials for Paving Bingley Place and Creasey's Alley. Mr. J. Spencer, Clerk to Board of Works, Greenwich.

DEWSBURY.—Jan. 31.—For Construction of Embankments, &c, for Forming Two Reservoirs. Mr. G. H. Hill, Engineer, 3 Victoria Street, Westminster.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

DOVER.—Jan. 22.—For the Erection of New School of Art, Science and Technology. Mr. E. Wollaston Knocker, Castle Hill House, Dover.

DRAX.—Jan. 23.—For Rebuilding School and Alterations. to others. Mr. H. B. Thorp, Architect, Goole.

EAST HAM.—Jan. 16.—For the Supply of Flat Norway or Cornish Granite Kerb. Mr. C. E. Wilson, Public Offices, Wakefield Street, East Ham.

FULHAM.—Jan. 17.—For Making-up and Paving Dona Road and St. Alban's Terrace. Mr. W. J. H. Denselow, Town Hall, Walham Green.

FELIXSTOWE.—Jan. 19.—For Building Five Dwelling-houses for the Coastguard. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

GLASGOW.—Jan. 22.—For the Various Works in Building Family House, St. Andrew Street. The City Engineer, 64 Cochrane Street, Glasgow.

HAMMERSMITH.—Jan. 16.—For Supply of New Steel Pontoon and Alterations and Additions to Steamboat Pier. Mr. H. De la Hooke, Clerk to London County Council, Spring Gardens.

HANLEY.—Jan. 29.—For Electric Light and Fittings for Corporation Buildings. Mr. Joseph Lobley, Borough Engineer, Town Hall, Hanley.

ISLINGTON.—Jan. 14.—For New Installation of Washhouse Metals, Drying Closets, Steam Engines and Machinery, Hot, Cold Water and Steam Supplies, and Waste Pipes to the Baths and Washhouses and Heating Pipes for General Warming of the Whole Establishment, for their New Baths and Wash-houses. Mr. A. Hessel Tiltman, 70 Torrington Square, W.C.

KIDDERMINSTER.—Jan. 17.—For Construction of Engine Pump-room and Tank, Laying Drains, &c. Mr. Arthur Comber, Borough Surveyor, Town Hall, Kidderminster.

LEEDS.—Jan. 15.—For Erection of Public Baths. Mr. Walter Hanstock, Architect, Branch Road, Batley.

MACCLESFIELD.—Jan. 22.—For Building Isolation Hospital. Mr. Stanhope Bull, County Surveyor, 84 Northgate Street, Chester.

MANCHESTER.—Jan. 31.—For Building Stores, Show-room and Workshop. Mr. C. Nickson, Superintendent of the Gas Department, Town Hall, Manchester.

MANGOTSFIELD.—Feb. 6.—For the Construction of Main Outfall and Branch Sewers, Precipitation Tanks and Filter Beds, Erection of Sludge Pressing Buildings, Chemical Stores and Erection of Sludge-pressing Plant and Mixing Machinery. Mr. S. F. Andrews, Keynsham Union, Keynsham.

MANSFIELD.—Jan. 16.—For Sinking Well near the Mansfield and Southwell Turnpike Road. Mr. R. J. Parsons, Town Clerk, Mansfield.

NEWPORT, ISLE OF WIGHT.—Jan. 23.—For Building an Asylum at Whitecroft. Mr. B. S. Jacobs, Architect, 88 Bishops-gate Street Within, E.C., and Hull.

ORMSKIRK.—Jan. 23.—For Building Engine-shed. The Engineer, Hunt's Bank, Manchester.

PARLIAMENT HILL.—Jan. 16.—For Building Refreshment Room. The Architect's Department, County Council Offices, 13 Spring Gardens, S.W.

PONTYFRIDG.—Jan. 20.—For Constructing Brick Gas-holder Tank. Mr. Thomas Newbigging, Engineer, 5 Norfolk Street, Manchester.

PORTSMOUTH.—Jan. 30.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

ROMFORD.—Jan. 18.—For the Supply of 900 Tons of Blue Guernsey Granite and 400 Tons of Belgian Granite. Mr. Geo. Bailey, Local Board Offices, Romford.

SHEFFIELD.—For Building Nineteen Houses, Queen's Road. Mr. E. Winder, jun., Architect, Wharf Street, Sheffield.

SHEPTON MALLET.—Jan. 24.—For Constructing Reservoirs, &c. Mr. H. A. Budd, 27 Peter Street, Shepton Mallet.

SOUTHPORT.—Jan. 16.—For Construction of Five Slaughter-houses and Five Lairs at Blowick. The Borough Surveyor.

STEVENTON.—Jan. 24.—For Building School and Teacher's Residence. Mr. J. Gibson, Architect, New Street, Basing-stoke.

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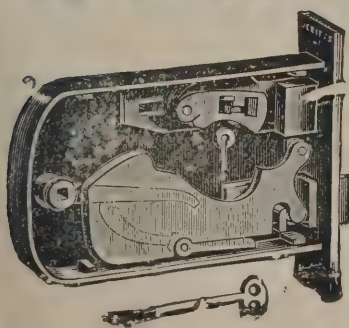
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THURSO.—Jan. 27.—For Construction of Pier at Island of Stroma and at Dwarwick Head. Mr. James Barron, Engineer 7 Union Terrace, Aberdeen.

UPPER EDMONTON.—Jan. 16.—For Supply of Iron Bridges at the Strand Union Workhouse Buildings in Silver Street. Mr. C. F. Dorrell, 15 Henrietta Street, W.C.

WALMER BRIDGE.—Jan. 17.—For Building Primitive Methodist Chapel. Mr. W. H. Dinsley, Architect, 20 High Street, Chorley.

WALSALL.—Jan. 16.—For Alterations to Board School. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WALTHAMSTOW.—Jan. 24.—For the Erection of Public Library Buildings. Mr. Gilbert Houghton, Town Hall, Walthamstow.

WANDSWORTH.—Jan. 22.—For Extension of Works and Supply of Materials in the Various Parishes in Wandsworth District for One, Two or Three Years. Mr. Henry George Hills, Clerk to Board of Works, East Hill, Wandsworth.

WATERTVILLE, Co. KERRY.—Jan. 30.—For Building Coast-guard Station. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

WOTTON-UNDER-EDGE.—Jan. 17.—For Works of Water Supply, Reservoir, &c. Mr. A. P. I. Cotterell, Engineer, Lonsdale Chambers, Baldwin Street, Bristol.

TENDERS.

BIRKENHEAD.

For First Section of Hoyle Office.	Mr. THOMAS W
CUBBON, Architect, Birkenhead.	
W. H. Bleakley & Co., Birkenhead	£1,165 0 0
J. Shaw, Birkenhead	1,139 0 0
Brown & Backhouse, Liverpool	1,088 0 0
Holme & Green, Liverpool	1,069 10 0
Hughes & Stirling, Liverpool	1,065 0 0
J. Merritt, Birkenhead	1,063 0 0
Smith Bros., Hoylelake	1,040 0 0
Raffle & Campbell, Liverpool	1,025 0 0
T. Lee, West Kirby	988 7 6
W. W. Christian, Hoylelake	984 1 2
W. H. Ford, Birkenhead	978 0 0
T. F. HILL & Co., Woolton, near Liverpool (accepted)	936 0 0

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For Painting and Decorating Public Market Hall, Birkenhead, for the Corporation. Mr. CHARLES BROWNIDGE, Borough Surveyor.

J. Russell, Birkenhead £397 0 0

For Painting Courts, Offices, Rooms and Corridors in the Sessions Court Buildings, Birkenhead, for the Corporation. Mr. CHARLES BROWNIDGE, Borough Surveyor.

McLachlan & Batkin, Birkenhead £309 7 10

BOLTON.

For Building Fireproof Mill and Appurtenances at Moses Gate, for the Bolton Textile Mill Company, Limited. Mr. SIDNEY STOTT, Architect, York Chambers, Oldham.

Accepted Tenders.

J. Partington, Chadderton, near Oldham, Building and Reservoir.

B. Walmsley, 14 Mawdsley Street, Bolton, Rolled Steelwork. Hick, Hargreaves & Co, Limited, Soho Ironworks, Bolton, Cast Ironwork.

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J. Morton & Co., Halifax	217 16 1
S. Evers & Co., Stourbridge	189 17 2
G. K. Harrison, Stourbridge	189 5 4
Bowens, Limited, Stourbridge	185 2 4
Harris & Pearson, Stourbridge	182 8 4
Harper & Moore, Stourbridge	181 14 10
B. Gibbons, jun., Dudley	178 7 5
Trotter, Haines & Corbett, Stourbridge	176 3 5
Mobberley & Perry, Stourbridge	175 0 8
Mobberley & Bayley, Limited, Stourbridge	167 15 1
Hickman & Co., Stourbridge	165 2 3
King Bros., Stourbridge	162 19 3
TIMMIS & Co., Stourbridge (accepted)	146 0 11
J. White & Co., Widnes (bricks only)	50 5 4

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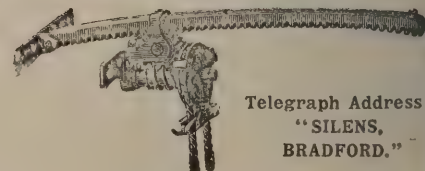


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D. Rowell & Co., Westminster	540	15	6
Economic Fencing Co., London	522	10	0
Hill & Smith, Brierley Hill	498	11	6
Walker Bros., Walsall	426	0	0
C. Wilcox, Limited, Tipton	425	0	0
Rubery & Co., Darlaston	410	0	0
Johnson Bros & Co., Walsall	393	15	0
Bayliss, Jones & Bayliss, Wolverhampton	375	0	0

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W. Wistance, Walsall	479	0	0
Bradney & Lloyd, Wolverhampton	350	0	0
Rowland Bros., Fenny Stratford	299	0	0
C. Linford, Cannock	257	0	0
Rudder & Son, Birmingham	252	1	0
J. H. Walford, Birmingham	249	0	0
M. B. Anderson, Cannock	230	0	0
J. REYNOLDS, Cannock (accepted)	212	0	0
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For Building Baths, Winter Garden, &c., Harrogate. Messrs. BAGGALLAY & BRISTOWE, Architects, 66 Conduit Street, Regent Street, London, W. Quantities by Mr. HOFFMAN WOOD and Mr. LINLEY OLDROYD, Leeds.

Isaac Gould, Leeds, excavator, bricklayer, mason, carpenter and joiner	£46,500	0	0
H. Braithwaite & Co., Leeds, plumber, glazier, smith and ironfounder	14,500	0	0
J. T. Pollard & Son, Leeds, painter	1,326	0	0
S. Johnson & Son, Mirfield, plasterer	1,627	18	5
J. Shepherd, Harrogate, slater	747	3	0

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For Construction of Turkish Baths at Broad Street House, Old Broad Street, E.C., for Messrs. J. & H. Nevill. Mr. G. HAROLD ELPHICK, Architect, Broad Street House. Quantities by Messrs. BATSTONE BROS., 110 Cannon Street, E.C.

Paramor & Sons	£5,750	0	0
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W. H. Lascelles & Co.	5,024	0	0
Macfarlane Bros.	5,020	0	0
Woodward & Co.	4,840	0	0
Colls & Sons	4,731	10	0
WILLIAM DOWNS (accepted)	4,670	0	0

For Building Public Baths and Washhouses, Tibberton Square, Islington, N. Mr. A. HESSELL TILTMAN, M.R.I.B.A., Architect, 70 Torrington Square, W.C.

	A.	B.
Tylor & Sons	£8,657 18 0	£350 0 0
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Purcell & Nobbs	6,859 0 0	340 0 0
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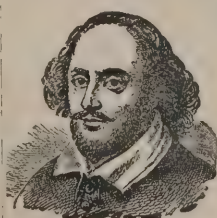
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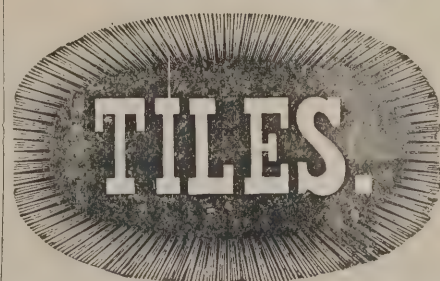
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Dabbs, London	1,692	7	0
W. Downs & Co., London	1,644	6	0
Roome, London	1,624	5	0
Clarke & Bracey, London	1,589	4	0
Scrivener & Co., London	1,564	3	0
J. Marsland, London	1,545	2	0
Baalam Bros., London	1,406	1	0

For Alterations to Shop Front and Fittings, &c., to No. 16 Cornhill, for Mr. A. V. Neville. Messrs. WADMORE, WADMORE & MALLETT, Architects, 35 Great St. Helen's, E.C.

Clarke & Bracey	£1,409	0	0
F. Sage & Co.	1,365	15	0
W. H. Lascelles & Co.	1,145	0	0
Scrivener & Co.	1,125	0	0
DREW & CADMAN (accepted)	1,106	0	0
Ashby Bros.	995	0	0

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Jenkins & Sons, Porth	£1,000	0	0
Jones & Davies, Dinas	995	10	0
W. Williams, Pontypridd	876	0	0
T. MORGAN, Penygraig (accepted)	850	0	0
Architect's estimate	833	0	0

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For Reconstruction of Sewer in Athenæum Street. Mr. J. PATON, Borough Surveyor, Plymouth.

J. Shaddock, Plymouth	£877	1	6
E. Duke, Plymouth	859	15	9
W. Shaddock, Mannamead.	819	0	0
Westlake & Waldron, Stonehouse	788	19	9
C. L. DUKE, Plymouth (accepted)	784	16	6

NEWCASTLE-ON-TYNE.

For Building the Burt Hall and Offices, for the Northumberland Miners' Association, in Northumberland Road. Mr. JOHN W. DYSON, Architect, 18 Grainger Street, Newcastle-on-Tyne.

W. C. Tyrie, Gateshead	£6,552	2	0
J. & W. Lowry, Newcastle	6,376	14	0
Middlemiss Bros., Newcastle	6,271	18	0
T. Weatheritt, Newcastle	6,071	3	7
J. Ferguson, Newcastle	5,612	0	0
S. B. BURTON, Newcastle (accepted)	5,422	16	8

Plumbing.

A. Scott, Newcastle	535	4	5
J. T. Hobson, Newcastle	532	16	7
Threlkeld & Wallace, Newcastle	532	11	9
H. Walker & Son, Limited, Newcastle	475	17	2
M. Gibson, Newcastle	474	5	6
S. PERCY, Newcastle (accepted)	468	12	10

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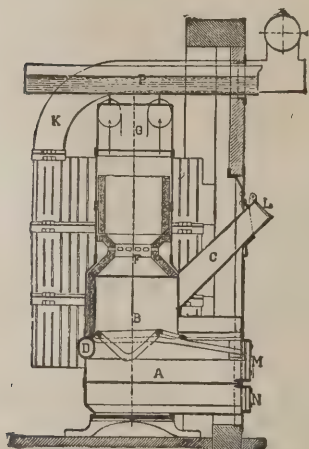
For New Vicarage, Christ Church, Paignton, Devon. Messrs. GEO. SOUDON BRIDGMAN, M.S.A., and NORMAN G. BRIDGMAN, A.R.I.B.A., Architects, Torquay and Paignton.

W. Goss, Torquay	£1,811	0	0
R. Yeo, Torquay	1,775	0	0
Rabbich & Brown, Paignton	1,647	0	0
G. Webber & Maunder, Paignton	1,622	0	0
E. P. Bovey, Torquay	1,620	0	0
E. Westlake, Paignton	1,612	0	0
Drew Bros., Paignton	1,599	0	0
H. Webber & Sons, Paignton	1,597	0	0

PORTSMOUTH.

For Alterations and Additions to Board School, Penhale Road, Portsmouth. Mr. ALFRED H. BONE, Architect, Portsmouth. Quantities by the Architect.

T. W. Quick, Portsmouth	£11,500	0	0
E. A. Knight, Portsmouth	11,385	16	2
W. W. Learmouth, Portsmouth	10,800	0	0
H. Willcock & Co., Wolverhampton	9,995	0	0
J. W. Perkins, Portsmouth	9,970	0	0
E. & A. Springings, Portsmouth	9,960	0	0
T. P. Hall, Portsmouth	9,900	0	0
J. Biden, Portsmouth	9,897	0	0
H. JONES, Portsmouth (accepted)	9,782	0	0



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For Additions and Alterations to Shop, Windsor Road, Penarth, for Messrs. Nulton & Fennell. Mr. HAVELOCK CORNISH, M.S.A., Architect, 43 Windsor Road, Penarth.
M. H. TAPE, Penarth (*accepted*) £344 10 0

RUSHDEN.

For Building Boot and Shoe Factory, New Street, Rushden, for Mr. J. Northern.
H. Knight £360 0 0
For Building Three Houses, Queen Street, Rushden, for Mr. C. Burfield.
T. & C. Berrill £584 10 0
R. Marriott 575 0 0
T. Willmott 568 0 0
H. KNIGHT (*accepted*) 558 0 0

SALE.

For Improvement Works, Palmer Street, and Passages adjoining, for the Sale Local Board. Mr. A. G. M'BEATH, Engineer.
M. Naylor & Sons, Manchester £318 10 0
W. Barton, Hale 260 0 0
G. BOZSON, Ashton-on-Mersey (*accepted*) 220 0 0

SOUTHEND.

For Improvement Works, Harrington Road. Mr. C. T. COPLEY, Borough Surveyor, Southend.
Bensted & Luke £704 2 0
W. Griffiths 610 15 1
J. Dupont 605 17 0
W. Buxton 602 7 4
E. Iles, South Wimbledon 559 0 3

TORQUAY.

For New Banking Premises for the Devon and Cornwall Banking Company, Limited, Torquay, Devon. Messrs. GEO. SOUDON BRIDGMAN, M.S.A., and NORMAN G. BRIDGMAN, A.R.I.B.A., Architects, Torquay and Paignton.
J. Finch, Plymouth £4,090 0 0
C. & R. E. Drew, Paignton 3,643 0 0
E. Westlake, Paignton 3,595 0 0
H. Webber, Paignton 3,578 0 0
J. Chubb, Torquay 3,179 8 0
E. P. Bovey, Torquay 3,166 15 0
J. Smerdon, Torquay 3,098 10 0
Rabbich & Brown, Paignton 3,036 0 0
VANSTONE & MUMFORD, Torquay (*accepted*) 2,995 6 0

SOUTHOWRAM.

For Main Drains, with Manholes, Lampholes, &c., Marsh Lane, Common Lane, Law Lane, School Lane, Marsh Delves Lane, Construction of Filter Tanks, &c., for the Southowram Local Board. Mr. W. H. D. HORSFALL, Surveyor, 9 Harrison Road, Halifax.
J. Bateman & Co., Elland £1,581 10 8
A. Bland, Halifax 1,480 14 2
T. Kitchen, Halifax 1,443 19 1
H. Tyson, Halifax 1,307 5 2
M. Hall, Bradford 1,251 2 11
B. & T. H. Riley, Halifax 1,221 14 0
H. Barraclough, Brighouse 1,194 14 5
J. Wells, Halifax 1,184 11 8
G. Pearson, Cleckheaton 1,135 2 10
J. Balmford, Elland 1,126 10 0
Waddington Bros. & Holmes, Oxenhope 1,123 11 4
R. Hopkinson, Halifax 1,071 13 2
HEMMINGWAY & MARSHALL, Southowram (*accepted*) 1,057 9 11

WALTON.

For Construction of Stone Bridge over the River King, at Dove Cote Ford, in the parish of Walton, Cumberland. Mr. G. J. BELL, County Surveyor, The Courts, Carlisle.
T. TELFOUR, Langholm (*accepted*) £963 0 0

WOLVERHAMPTON.

For Drainage Works, Newbridge District.
H. HOLLOWAY (*accepted*) £4,349 0 0

TRADE NOTES.

MR. F. S. HAM, the well-known representative of Messrs. J. Stone & Co., Deptford, for London, South and West of England and Wales, has resigned his appointment, and commences business as manufacturer of fittings for water supply and sewerage, under the style of Ham, Baker & Co., Municipal Engineering Works, 13 Grosvenor Road, Westminster.
THE Corporation of Halifax have presented a clock with Cambridge chimes and four illuminated dials to St. Jude's Church, Skircoat Moor, which is used as a health resort and

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recreation-grounds. The necessary work in the making and erecting of the same has been carried out by Messrs. Wm. Potts & Sons, of Leeds, and the builders' work by Messrs. Charnock & Sons and Edward Foster & Sons, of Halifax.

THE Workhouse, Grimsby, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE minutes of the Waterworks Committee, submitted at the meeting of the Bradford County Council, included a recommendation to accept the tender of Messrs. Morrison & Mason, Limited, of Glasgow, for the construction of a main aqueduct from the river Nidd to Chellon Heights, a distance of $3\frac{1}{2}$ miles, together with branch aqueducts and other work in connection, for 286,259*l.* 7*s.* 10*d.* Mr. Holdsworth, chairman, said the tenders were close on the estimate of the engineer.

THE Runcorn Rural Sanitary Authority have decided to accept the tender of Messrs. E. Timmins & Sons, Limited, Runcorn, amounting to 3,100*l.*, for the construction of waterworks for Frodsham.

THE new fire engine purchased by the Southport Corporation from Messrs. Merryweather has just been submitted to its first public trial in front of the Cambridge Hall. The mayor, Dr. Wood, performed the initial ceremony of lighting the furnace, and in 8 minutes 20 seconds a steam pressure of 100 lbs. was registered. With a single jet, measuring $1\frac{1}{2}$ of an inch in diameter, a fine volume of water taken from the public fountain by means of suction pipes was sent over the Cambridge Hall, and other successful experiments were made with $1\frac{1}{2}$ inch, $2\frac{3}{8}$ of an inch jet; also three jets playing simultaneously.

THE Leamington Town Council have accepted for the construction of a new reservoir for the Lillington water supply works the tender of Mr. Bowen for 1,492*l.*

THE Harrogate Town Council have accepted tenders amounting in the aggregate to 64,701*l.* for the erection of the new Montpelier Baths.

MESSRS. COMYN CHING & CO., of London, the patentees and proprietors of the original Thomas Boyle's patent "Mica" flap ventilator, have added a very important patented improvement, doing away with any fault that could be found with the original. By the introduction of a shield plate at back with intermediate baffle plates, arranged in accordance with

scientific principles, it will be found that whilst a free flow of air passes through the ventilator, the direct pressure is taken off the flaps, and they are now entirely protected from the smoke in the chimney, and the reverse action has been entirely overcome. The improved ventilator can, it is claimed, be confidently fixed in any air-shaft or smoke-flue; its action is steady and continuous, requires no attention when once fixed according to directions, is a sure preventative of back-draught, and is smoke-proof and absolutely noiseless in action. The smoke or dust cannot reach the valves, so that no corrosion of the hinges takes place from this cause, and the material is all incombustible; hence these ventilators are practically everlasting.

AT Dudley an inquiry has just been held respecting the application of the Town Council for sanction to borrow 8,653*l.* for public improvements of Netherton and Woodside, and 1,600*l.* for the completion of the new road from Dudley to Netherton. The estimated cost of the Netherton public hall is 2,797*l.*, the Netherton and Woodside public buildings 1,166*l.* and 1,000*l.* respectively, and the two free libraries 3,500*l.*

FOR a long time the Southend Town Council have been considering the drainage of the borough, and they have adopted a scheme prepared by Mr. Mansergh, C.E., for the perfecting and completing of the system.

THE Wolverhampton Town Council have accepted the tender of Mr. Herbert Holloway, of Bilston Road, amounting to 4,349*l.*, for the execution of work in connection with the main drainage of the western portion of the borough in the Newbridge district.

WE have received a letter from Mr. Charles H. Rosher in regard of a notice that appeared in our issue of the 22nd ult., entitled "Steam Jet Pumps." Mr. Rosher says:—"The 'Rain-bow' water raiser was the first to make a market, and among numerous rivals which have sprung up in imitation of it, still holds its own. I have used it and similar appliances for the last ten years for the purpose of heating and circulating water for baths, laundries, &c., and for warming air of buildings by hot-water circulation, and know others who have done likewise, and for this reason am surprised to read of the coming revolution." As the introducer of the "Rosher system" of heating and circulating large bodies of water in swimming baths, &c. (a system which was used at "Venice in London" and is now in use at "Constantinople at Olympia" on a very large scale), he protests against the pretensions of the notice in question claiming to describe a novelty.

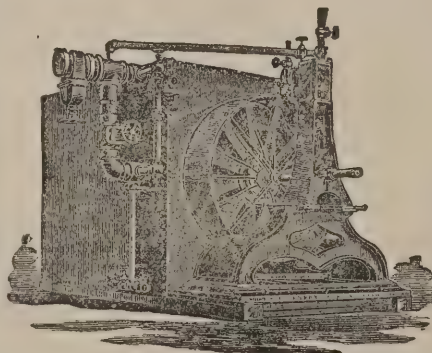
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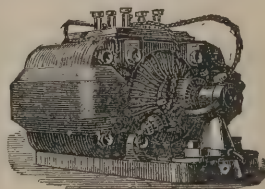
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BUILDING AND BUILDERS.

THE *Glasgow Herald* says:—Mr. Quarrier, of the Orphan Homes of Scotland, announces another gift of 1,000*l.* from a friend in Glasgow. The gift is the second one of 1,000*l.* from Glasgow, besides several smaller sums, and also 1,000*l.* from Liverpool, as well as 3,000*l.* from the East of Scotland, to build one of the homes.

At the meeting of the Metropolitan Asylums Board, a recommendation of the General Purposes Committee to erect a hospital at Shooter's Hill, to accommodate 500 patients, at an estimated cost of 220,000*l.*, with 300 nurses attached to it, was referred back for further consideration.

THE Tipton School Board have decided to purchase a plot of land situated on the Toll End Road, consisting of 4,500 square yards, at 3*s.* per yard, for the proposed new school for Ocker Hill.

THE *Leeds Mercury* says:—One of the oldest inhabitants of Hartlepool, Mr. J. Bridges, the sanitary inspector of the borough, has passed away, after a lengthy illness, at the age of seventy-two. After being apprenticed to Mr. Grainger, of Newcastle as a builder and joiner, Mr. Bridges came to Hartlepool as foreman joiner to the late Alderman Todd. Subsequently he went into business for himself, and in 1864 was joint-contractor for the erection of the Town Hall and Court House, and at a later period was in partnership with Mr. John E. Robson, as a saw-mill proprietor.

AN isolation or fever hospital is to be erected at Towyn, near Rhyl, from the designs of Mr. James Hughes, of Denbigh.

THE Albert Palace, Battersea, appears to be doomed to demolition, for notices have been set up announcing that the ground is to be sold for building purposes.

VARIETIES.

THE *British Medical Journal* says:—"The practice of keeping carbolic acid in bottles without labels or other distinguishing mark has been the cause of two more cases of accidental poisoning, one of them ending fatally. At a Christmas Eve party in Hull the acid was poured out in mistake for rum, and in one instance swallowed at a draught. We take this opportunity of expressing the hope that this

matter will receive speedy attention from the authorities, whose approval of the recommendation to place carbolic acid in the 'poison' schedule is requisite for making precautionary measures compulsory." We might add that the above paragraph merits attention, as the primary object of sanitary preparations is to aid the chances of life by removing unhealthy conditions that are prone to engender illness or endanger life. The only thing to be said is that those who have fallen victims of carbolic acid, wrongly used, had no lingering illness to endure before death.

THE Melton Mowbray Local Board have decided to adopt the International system for the purification of their sewage, and have instructed Mr. Edmund Jeeves, C.E., architect and surveyor, of Melton Mowbray, to prepare plans for the works.

At the meeting of the Filey Local Board it was resolved to apply for powers to borrow 5,600*l.*, in addition to the 12,000*l.* already borrowed. Of this 3,000*l.* are required to complete the sea-wall, 1,600*l.* for drainage works, and 1,000*l.* for the land and buildings for the Local Board Offices.

A PROPOSAL has been suggested in the Municipal Council of St. Petersburg for an international exhibition to be held in that city in 1903, on the occasion of the 200th anniversary of the foundation of the capital by Peter the Great.

THE Liverpool Architectural Society will hold its fourth ordinary meeting on Monday, the 15th inst., when Mr. W. H. Bidlake, M.A., will read a paper entitled "Imagination in Planning."

MR. JOHN CHESSELL BUCKLER, of Melbury, Cowley, St. John's, Oxford, who completed his 100th year on December 8 last, has just died. He was the eldest son of Mr. John Buckler, F.S.A. Inheriting his father's taste for the study of architecture, he practised as an architect till the ninetieth year of his age. He published a volume of "Etchings of the Cathedrals of England and Wales" in 1822, "An Account of Eltham Palace," "Remarks upon Wayside Chapels" and a "History of the Architecture of St. Albans Abbey Church."

THE Fulwood Local Board in a Parliamentary bill ask for further powers for the improvement of their existing water supply. They propose to construct a reservoir at Goosnargh-with-Newsham, with a conduit or line of pipes connecting it with the existing reservoir, and to take water from the streams flowing into the Wyre. The Board propose to raise 30,000*l.* for the repayment of loans authorised by previous Acts,

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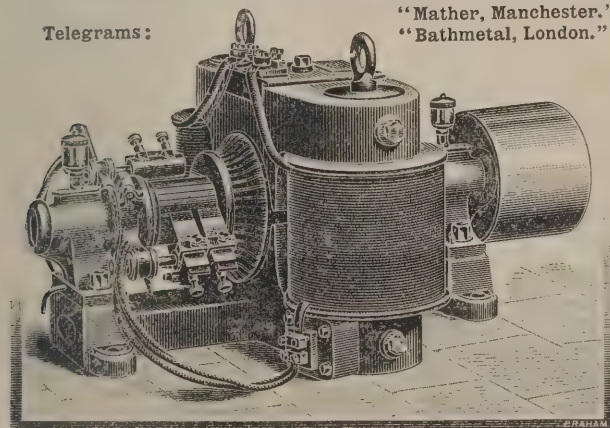
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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10,000*l.* for waterworks purposes and 5,000*l.* for sewerage purposes.

At a meeting of the Wakefield Chamber of Commerce, Mr. Charles Clay, J.P., of Walton Grange, who presided, brought before the chamber the question of a ship canal between Wakefield and Goole. The idea was favourably received.

At Stratford-on-Avon an inquiry has been held by the Local Government Board with reference to an application of the Town Council to borrow 8,500*l.* for the purchase of land, &c., in connection with the water-supply, 500*l.* for the provision of water-meters and 450*l.* for works of street improvement.

At the meeting of the Widnes Town Council attention was called to the dangers of the level crossings in the borough. It was also agreed that the arrangements both as regards train service—particularly through traffic—and station accommodation were totally inadequate to the requirements of the borough, and that in failing to comply with the reasonable requirements of the Corporation, the directors of the I. & N.W. Railway Company had treated the public wants with a lack of consideration, and that the Town Clerk be instructed to request the directors to give the matter their further attention.

The Bury Corporation have submitted a parliamentary Bill which proposes to authorise that body to construct new sewers and sewage works, the cost of which is estimated at 110,000*l.*, and to raise 50,000*l.* for gasworks purposes, 10,000*l.* for fire brigade purposes, and 3,000*l.* for additions and alterations to the refuse destructor. Among the provisions of the Bill is one which empowers the Corporation to compel the registration of gasfitters, and prohibits a gas consumer from employing any but an "authorised gasfitter" under penalty of a discontinuance of the supply, while other clauses authorise the Corporation to contribute to the maintenance of public bands of music and to provide seats for public use in the parks, gardens, &c.

At the meeting of the London City Commissioners of Sewers, it was stated that since the recent snowfall 2,000 of the unemployed had been engaged at a cost of 400*l.* to clear away the snow; 25 extra carts and horses had been hired in the work, which involved the cartage of 10,000 loads of snow.

MESSRS. EARLE'S SHIPBUILDING COMPANY of Hull have successfully launched a twin-screw steamer, which they have built for the Great Eastern Railway Company's continental service between Harwich and the Hook of Holland. This vessel, which was named the *Berlin*, is a steel twin-screw

steamer 302 feet in length by 36 feet beam, and has two separate sets of triple-compound engines, which are expected to give a speed of about 18 knots per hour. The cabin accommodation is similar to the *Chelmsford*, which was built by the same firm for the Hook of Holland route last summer, the *Berlin* being a sister-ship, with the exception that she has a little more length and beam. The Great Eastern Railway Company intend to have four boats of this type to perform the service.

MR. GEORGE ALMOND, of Burnham, Bucks, writes to us as follows:—Reading in *The Architect and Contract Reporter* for last week the account of "Early Pavement Tiles," I commenced making bricks here, and I am of opinion that there was a tile works here in ages past, as we met with floor tiles when ploughing up the land and making the clay. The tiles are 4 and 4½, and patterns and glaze are still perfect. We have discovered flint formations which may be remains of a kiln. We have met with a few Roman bricks, and I suppose they were about 9½ by 4½ by 1½. But I think it was more of a floor and tile works. Our church had some of these tiles previous to its restoration, and Hitcham Church close by contains some still; and a few years back a lot were dug up on the site of the old abbey here.

THE *Standard* says:—The series of accidents, many of them fatal, that have occurred during the last few days in connection with the bursting of kitchen boilers, demonstrates the existence of a danger as yet imperfectly apprehended, and perhaps still less understood. It is self-evident that if the supply of water is cut off from a boiler and steam continues to be generated without any outlet, an explosion must, sooner or later, ensue, the steam liberating itself by rending in pieces the vessel that contains it. A plug of ice in a communicating pipe will be quite sufficient to set up this perilous condition of things, providing there is no proper arrangement to meet such a contingency. In the case of the more serious class of explosions there is generally a species of high-pressure boiler in use, intended not only to serve the ordinary wants of the kitchen, but to supply hot water to the floors above. In all such cases there should be an exhaust pipe, to provide an outlet for superfluous steam. There are kitchen boilers, especially in the better class of houses, which are distinctly of the high-pressure type, and these demand a safety-valve of some kind.

THE *Leeds Mercury* says:—Mr. W. S. Braithwaite, architect, writes to us as follows:—Very few tenants living in houses

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fitted and supplied with hot-water circulation have any idea how to manage the same. The maid or mistress under ordinary circumstances draws hot water from the tap, without the least knowledge as to how the hot water gets there. Special legislation is needed to enable the local authorities to compel builders to place the cisterns in rooms where they can be seen, and not in the false roofs, attic ceilings, and such places, where they are exposed, and where it is impossible for them to be examined. I would go further, and instruct children in the rudiments of hot-water circulation, that they may teach their parents. How many householders even know how to prevent their rooms being inundated with water when a thaw sets in, believing that the thaw causes the bursting of pipes, when the burst has, in fact, been caused by the expansion of ice in the pipes during the frost.

At the meeting of the Works Committee of Edinburgh and District Water Trust, a letter was submitted from Mr. Reid, of Messrs. J. & A. Leslie & Reid, engineers to the Trust, intimating that he had assumed Mr. Wilson, who is at present connected with the Greenock Corporation Waterworks, as a partner in his business, owing to the death of Mr. A. Leslie.

ELECTRICAL.

OWING to increase of business of the Electrical Installation Company, Limited, 64 Victoria Street, this company are extending their premises and announce that they are moving into additional offices at 66 Victoria Street, to which number their "general office" will be moved on Monday, the 8th inst. They have also started works in Pimlico, where they are manufacturing some of their specialties, *inter alia*, their new patent "Vauxhall" arc lamp, their patent "Britannia" automatic projector for marine and photographic purposes and apparatus for the application of their new system of electric heating.

THE Stirling Town Council, by the casting vote of the chairman, have resolved not to grant the application of the Caledonian Electric Supply Company for a provisional order to supply the burgh with the electric light. It is understood the company will nevertheless proceed with their application, which was supported by a petition signed by 171 shopkeepers and 217 residents, including nearly all those in the new part of the town.

At the meeting of the Gas Committee of the Aberdeen Town Council the rates to be charged for electric meters were settled. It was resolved that the charges should vary from 5s. to 30s. per quarter. It is expected that the meter that will be most commonly used will be the one on which the rate is 7s. 6d. per quarter.

At the meeting of the Liverpool Watch Committee a letter was read from the Gas Company stating that from the 1st inst. the charge for the supply of gas to the public lamps would be increased by 4d. per 1,000 cubic feet. The town clerk was instructed to write to the company expressing a hope that a reduction would be made in the price for the supply to the public lamps.

WORTHING is about to be the scene of experiments in the shape of sewage disinfection by means of electrolysed sea water. The Town Council have voted a considerable sum of money to enable M. Hermite, the French sanitary engineer, whose method of electrical sanitation has proved so successful at Havre, Lorient, &c., to get to work during the present month to demonstrate the efficiency of his system for the first time in an English town. If the system proves as successful as M. Hermite fully anticipates, it will be a very valuable solution of a problem which intimately concerns the welfare of every seaside community in the kingdom.

OPTIMUS 100-GUINEA PHOTOGRAPHIC COMPETITION, 1893.

WE have received from Messrs. Perken, Son & Rayment, a list of the awards in this competition:—

Class I.—Sub-class A, Transposed; sub-class B, J. H. Avery, W. Crofton Hammons. Class II.—Sub-class A, W. Galloway, J. C. Oliver, J. Wickens. Class III.—Geo. Reade, for a set of prints; Mrs. S. F. Clarke, for a set of prints. Class IV.—Transposed. Class V.—Sub-class A, Miss E. R. Marcus; sub-class B, transposed. Class VI.—A. F. Jarvis, for a set of prints; A. T. Bucknall, J. W. Morgan, T. G. Gamlin, R. Laverack, for a set of prints. Class VII.—J. H. Gear. Class VIII.—Transposed. Class IX.—E. Brightman.

In accordance with proviso on entry forms several prizes have been transposed to classes other than those originally named, the judges deciding such a course advisable.



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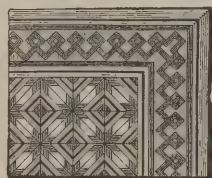
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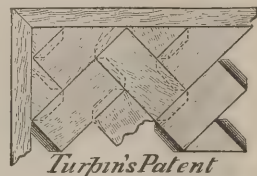
5.16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

ARTISTIC



OAK BLOCK FLOORINGS

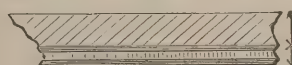
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Also in Pitch Pine, Teak, Deal, &c.



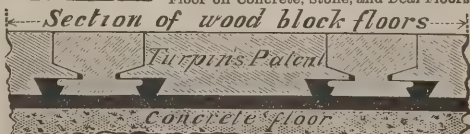
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ILLUSTRATIONS.

ST GEORGE

GROVE HOUSE, HARROGATE

HALTON, HERTS.—FOOT OF GRAND STAIRCASE.

PATENT LAWS.

THE Glasgow and Scottish section of the Society of Chemical Industry have held a meeting in Glasgow to discuss the Patent Laws of the country. Mr. Charles A. Fawsitt presided, and said there could be little doubt that an inventor had often very great difficulty in getting legitimate or fair protection. He no sooner patented something of value than there were many who tried to take the wind out of his sails, although not actually coming into collision with him. A system of research, if originated, might be of great practical use, and no doubt it would be very valuable if a body of men could be found to sift out those patents which had been anticipated, but there was always the suspicion that among these men there might be some who had an interest in a patent. There were very few who could judge clearly of the value of a patent, and although Chambers of Commerce had been suggested for such a purpose, he did not think that, as at present constituted, they were competent to judge upon such matters. Mr. J. S. Macarthur said he would rather have the British Patent Laws than those of Germany or America. He suggested a scheme whereby examiners should be appointed to look into the specifications of inventions, and report the result of their researches to the applicant for the patent. He thought it was absurd that the Government should place such high tax upon alcohol, as it allowed the inventors of other countries to get far ahead of this country in the matter of aniline (dyes and such things. Mr. G. T. Beilby thought there should be some method of restriction based upon proofs of practical success in attaining the objects aimed at, before an old patent should be allowed to stand in the way of a new application. Other speakers gave the meeting the benefit of their experience, and it was agreed to remit the information obtained to the committee of the society charged with the consideration of the subject.

THE ANTWERP EXHIBITION.

IN a letter Mr. De Courcy-Perry, the British Consul at Antwerp, says that few people in England realise the extent and importance of the approaching Antwerp exhibition. So far as regards the size of the grounds and the dimensions of the main buildings, it will be about one-third the size of the Columbian exhibition. Jackson Park has an area of nearly 600 acres, and the main buildings covered 80 acres. The park in which the Antwerp exhibition will be held is 200 acres, and the main buildings will enclose 25 acres.

The smaller buildings, which will be erected in the grounds, will be at least equal in beauty to those that adorned the American exhibition. As regards the importance of this exhibition, it is sufficient to say that France and Germany, Austria, Italy, the United States, Canada and other foreign countries will be largely represented, and that the industries of Belgium will be well displayed. There have been placed at the Consul's disposal, in the very best part of the building, for the use of British exhibitors, about 60,000 square feet (5,900 square metres), exclusive of the maritime display, which is under another organisation, so that there is ample room for British manufacturers to make a representative show. As no grant has been made to defray expenses, and as the exhibition authorities levy a tax on space, it is necessary to make a charge per square foot to exhibitors, this charge varying according to the importance of the location. This drawback is, however, compensated by the privilege accorded to exhibitors to sell for current delivery on payment of a small tax. The Foreign Office has authorised the Consul to accept the position of Commissioner-General, an appointment carrying with it full and complete control of the section, and not a little grave responsibility on account of the absence of a grant. The official headquarters of the British section are in Antwerp, and the Consul will have the advantage of the counsels of an advising committee, known as the Antwerp Committee, that meets in Antwerp or London, as may be most convenient. He has, further, the great advantage of the assistance of the London Chamber of Commerce, that has, under the chairmanship of Sir Albert Rollit, formed an executive committee, whose function is to interest manufacturers and induce them to come forward as exhibitors. All applications received by this committee, as well as those coming through the independent agencies, will be referred to the Consul for allotment, which will be made as quickly as possible.

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Chicago Exhibition, 1893.

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informing British manufacturers on every point connected with the exhibition, the Consul hopes that the British section will hold its own against those of France and Germany.

IMPROVED FOLDING PARTITIONS FOR SCHOOLS, PUBLIC BUILDINGS, &c.

CONSIDERING what has been accomplished during the past few years in the way of improvements in machinery and patents of different kinds, one wonders what fresh fields there are for further developments, and the question arises, "Will they have to stop?" But when, day after day, we see and hear of this patent and that invention, we are forced to the conclusion that there are no bounds to the inventive ingenuity of the mind.

One of the ideas which often strikes one on seeing a new invention for the first time is, "How is it this has not been thought of before?" It appears so simple, and at the same time just what is required to supply a long-felt want."

Architects and others have been greatly puzzled in the past to find out the best and simplest method of dividing a large hall, public building or schoolroom by a temporary or movable partition easily moved, simple and reliable in construction. Many systems have been employed for this purpose, none of which have been altogether satisfactory. Among others may be mentioned the old-fashioned revolving shutters to coil up in a box in the ceiling, and movable slides which have to be taken down and refixed whenever the shutters are used. Other difficulties in connection with this arrangement are that an ordinary door and lock cannot be used, neither can glass be introduced for light and supervision; and further, the shutters are not rigid enough, nor are they sound-proof.

Panelled framing has been used in a variety of ways, too numerous to mention in detail. One plan adopted by some School Boards is to fix a piece of panelled framing one-third of the width of the school, and running two other sections behind it, the two loose sections sliding in grooves with pulleys. The great objection to this contrivance is the breaking of the sight line by a permanent obstruction, which renders the school useless for a large or public meeting—a system which we should strongly condemn. The invention to which we wish more particularly to call the attention of our readers is the improved folding partition, the sole makers of which are Messrs. Peace & Norquoy, of Port Street, Manchester. This partition is designed for dividing public buildings, schoolrooms,

warehouses, hotels, theatres, &c.; in fact, it seems to adapt itself to every place where a division of any kind is required—whether plain or artistic, wood or iron. No more schools need be cut up with brick or lath-and-plaster walls, or other primitive arrangement.

We take the following extract from the specification:—"This invention relates to the movable partitions or screens which are employed to screen off a portion of a room or to divide a large room into two or more smaller rooms, and are adapted to be moved when desirable, so as to give access from one division to another or to convert the two or more comparatively small rooms into a larger room. In the class of partition to which this invention relates, each partition is formed in sections or units, which are suspended and are adapted to be moved horizontally out of the way. The sections are suspended from carriages which run upon rails as usual, but in place of the sections being disconnected they are hinged together or the sections constituting the entire partition are divided into two or more sets, and the sections of each set hinged together. The sections are hinged together so that they can be folded one upon another similarly to an ordinary lap screen. When closing up the screen the outer meeting sections would be pushed away from each other right and left, and the sections would fold together. When thus folded the two parts of the partition would occupy comparatively small space. In some cases the partition would extend across the opening in one part, the said one part consisting of hinged sections. When the partition would be drawn out or pushed towards the side of the opening, the hinging together of the parts would insure parallelism of movement of the flaps composing the screen.

"The partitions are usually made in 2-inch panelled and moulded framing, with wood or glass panels, in sections about 3 feet 6 inches wide, hinged together with 3-inch steel back-flap hinges, and fixed in position with steel-faced flush bolts. Doors when required in partitions are hung with 4-inch steel butts, and fitted with rebated mortice lock and brass flush furniture. A groove is cut in the floor when fixing, and no previous preparation is necessary."

The inventors claim that this arrangement supersedes all other methods for dividing and subdividing rooms. By its means a large hall can be divided, or the partition, by an easy, gliding motion, folded back against the wall in two minutes, without leaving any obstruction on the floor. These partitions are being approved and specified by architects in the erection of new schools, and adopted by various School Boards.

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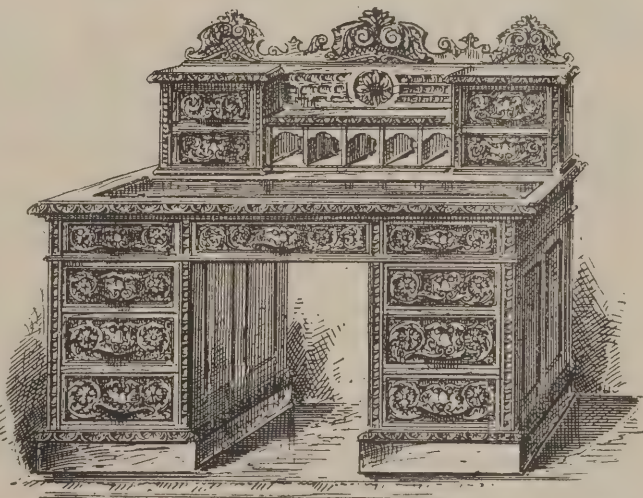
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LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE annual dinner of the Leeds and Yorkshire Architectural Society was held on Monday night in the Queen's Hotel, Leeds. The chair was occupied by Mr. George Bertram Bulmer, the president. After dinner the Chairman referred to the demise of the late Mr. W. J. Mettam, who had acted as hon. secretary to the society. Mr. George Cobson proposed "The Army, Navy and Volunteers," and Colonel E. Wilson responded. "The City and Commerce of Leeds" was proposed by Mr. Leonard Cooper, and responded to by Alderman Hepworth, president of the Leeds Mechanics' Institute. The toast of "The Royal Institute of British Architects and the Allied Societies" was proposed by Mr. W. H. Thorp. He said the Institute and allied societies existed largely for the purpose of promoting intercourse between the various members of the profession, in bringing subjects of architectural interest before them by means of papers read at the meetings of the various societies. They also kept in view the education of the younger members of the profession. The Institute of British Architects might be looked upon in the light of a sort of university. It was not an educating body, but it was an examining body. Those examinations had been largely taken advantage of by the younger members of the profession. Mr. William Emerson replied in the first instance. He alluded specially to the meeting held in Liverpool, the outcome of which was the establishment of a scheme to assist young gentlemen who proposed to enter the profession, and who were situated at long distances from the large towns, and found difficulty in obtaining the means of study. The Institute and the allied societies now formed a centre for the purpose of supplying information to the younger students, and there was every hope that the effort would yield good fruit. At the present day the motto was "Union was strength"; but there was a certain number of professional men who, for some reason, held themselves aloof from their brethren, and indulged in gibes and sneers at them. Such conduct did not advance architecture or the profession of the architect. There were clergymen, too, who wrote for the ostensible purpose of educating the public, and in their writings showed how little they knew about the subject. Those things showed how much need there was for architects to unite to uphold the honour and dignity of their own profession. Mr. Edward Solomons said the idea the public had as to the means

the architect had at his disposal to produce the buildings he did was quite extraordinary. They must let the public know that there was something in the architect beyond the mere builder. It was said that the difference between the architect and the builder was that one carried a wooden two-foot rule and the other carried an ivory two-foot rule. If the public could be initiated into the mysteries of their profession it would do them good, and it would do good to the architects. Mr. Edward Mitchell-Gibbs said he was disappointed to find that so little had come of the proposal to establish a chair of architecture for the northern societies. In his opinion, the only way to meet the difficulty of the education of architects was to establish in some part of the country an architectural college, possibly in the northern district, by a combination of such provinces as Liverpool, Manchester, Leeds, Sheffield and Nottingham, all of which were within easy railway communication of each other. The Royal Institute should, as soon as it could, abandon its position as an examining body, and undertake the teaching of the architects of the country. To him there was nothing more painful in the present style of architecture than the want of proportion. Some architects did not seem to have the slightest notion of it. As an example of noble proportion, he cited the Leeds Town Hall, which, in his opinion, was one of the master productions of the present century—remarkable for its splendid outline and masterly restraint, a standing protest against the present style of architecture, with its affectation of irregularity and of plan. The toast was responded to by Mr. Alfred Henry Paget and Mr. Wm. Hepper. Mr. William Emerson proposed "The Leeds and Yorkshire Architectural Society." In the course of a short speech he expressed disapproval of Mr. Gibbs's suggestion that the Institute should be an educational body. It was, he thought, quite an unreasonable suggestion, and he was of opinion that the education of architects should take place before they had anything to do with the Royal Institute of British Architects. The Chairman alluded to the success which had attended the operations of the Society. It was established eighteen years ago, he said, by a band of young men who were desirous of improving the road along which they had to travel. The tide of success on which they flowed had been fed by the three streams of patience, perseverance and discretion. Their membership had been gradually increasing and it was now over a hundred. "Literature, Science and Art" was proposed by Canon Scott and responded to by Mr. J. J. Wilson and the Rev. J. H. Dudley Matthews.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

ARGAND " 44 " " " " " "

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The last toast was "Our Guests," proposed by Mr. E. J. Dodgshun and responded to by Mr. John Harrison, the town clerk.

PUBLIC WORKS AT HARROGATE.

AT the monthly meeting of the Town Council just held, the borough surveyor was instructed to prepare plans and estimates for the repurchase and laying out of a portion of the Crescent estate; for alterations and extension of the Victoria Baths; for new pump-room and improvements in the Boys' Fields; for additions on the Corporation Farm, street improvements, purchase of property in Robert Street, steam fire-engine and escape; alteration to market, &c., in respect of the application to the Local Government Board for sanction to loans. Out of forty-four applicants Mr. J. Dodsworth, London, was appointed assistant-surveyor. It was also decided to proceed with the erection of the Montpellier Baths forthwith at a cost not to exceed 65,000*l.*, and tenders accepted which amounted to 64,701*l.* 18*s* 5*d*. A building committee was appointed.

HEATING APPLIANCES.

THE night of Thursday, the 4th inst., and the following day will often be quoted by meteorologists as a sample of a sudden and severe set in of cold weather. The temperature in the southern portion of England averaged 20 degrees of frost, and in some suburban districts of London the thermometer showed 22 degrees of frost—that is, 10 degrees Fahrenheit above zero. During the past few years occasionally 17 degrees and 19 degrees of frost have been registered, but the late cold snap came with scarce any warning on householders, and the inconvenience experienced by "old Father Frost" cutting off the domestic supply of water has been felt by numbers. There are numerous systems, however, available for the general public to counteract the erratic changes of our climate, all good in their way. Offices, warehouses, public buildings, private houses, &c., that we visit are supplied with some system, or occasionally with only a makeshift system. Entering from the outer air, the excellence or defects of the heating agent is readily perceivable. With regard to hot-water apparatus, we should say, from experience of premises we have entered during cold weather, other systems may equal, but cannot certainly excel, the small-

bore tube and low-pressure system. The purity of the air, genial warmth, with entire absence of stuffiness, was remarkable, and though our visit to the premises in question had nothing to do with subjects of heating and ventilation, as a matter of curiosity information asked for as to the system used was forthwith afforded. It was the small-bore tube and low-pressure system. Mr. Saunders (S. Saunders, late J. McIntyre & Co.), 93 and 95 Upper Moss Lane, Hulme, Manchester, has been working very thoroughly in this particular system of heating apparatus, and by his years of experience has been able to afford valuable improvements on an already reliable system. Presuming that our readers are aware of the merits of the small-bore and low-pressure system, we would call attention to the great advantage obtained by the improved tubes—a manifest gain which will be appreciated by our readers and those of the public generally, who, if they would not care to be called experts, at any rate have convictions founded on experience. What should now also appeal to many is the expedient whereby the freezing of pipes is obviated. Saunders's improved tubular boiler is well worth calling attention to, one desideratum being obtained among others, viz. uniformity of heat. We would recommend our readers to apply to Mr. Saunders for his pamphlet and catalogue. Though the weight of the two combined is just below four ounces, the information given in the text is very useful. Moreover, as it is concise there is nothing redundant admitted to waste the reader's time or obscure the meaning of the compiler.

AT the meeting of the Literary and Philosophical Society, St. Andrews, N.B., Colonel Bailey delivered a lecture on "Forestry in Great Britain." He observed that Scotland had always taken the lead in this question. He showed that the continuance of our present supplies of timber from abroad could not be relied on, and urged that we should look to our home resources and plant up a portion of the land which is unsuited for agriculture. He alluded to the recent revision by the Board of Agriculture of the orders relating to the use of home-grown timber in the erection of buildings under the Land Improvement Act, and to the facilities now afforded for the planting of trees under the provisions of that Act. He spoke of the recent storm, and explained how the effects of such storms might to some extent be modified. He concluded with some remarks on the effects of growing timber in open woods.



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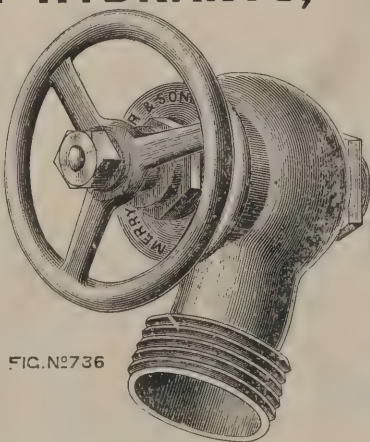


FIG. N2736



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SOCIETY OF ARTS.

THE ordinary meetings of the Society of Arts will recommence after the Christmas recess on Wednesday evening, the 17th inst., when Mr. A. P. Laurie will read a paper on "White Lead Substitutes." The arrangements for the succeeding Wednesdays are as follows:—January 24, "American Carriages," by Mr. G. Herbert Thrupp; January 31, "Californian Wines," by Mr. Charles P. Oldham; February 7, "Reproduction of Colours by Photography," by Captain Abney; February 14, "The St. Pancras Electric Light Installation," by Mr. Henry Robinson; February 21, "Electric Signalling without Wires," by Mr. W. H. Preece. The next course of Cantor lectures will be delivered on Monday evenings, January 22, 29, and February 5, 12, by Professor Frank Clowes, the subject being "The Detection and Measurement of Inflammable Gas and Vapour in the Air." Mr. Hugh Stannus will give a course of Cantor lectures on "The Decorative Treatment of Traditional Foliage," on February 19, 26, and March 5, 12. Further Cantor lectures will be delivered by Captain Abney on "Photometry," and by Mr. H. C. Jenkins on "Typewriting Machines."

THE HEIGHTS OF CORNER BUILDINGS.

IN obedience to another summons, Messrs. Lawrance & Co., who erected the block of buildings at the junction of the Kensington Road with Kensington Court, appeared at the West London Police Court on Tuesday. The alleged offence was the old one of exceeding the prescribed rules about height without the consent in writing of the London County Council. Originally the magistrate held that the building was in Kensington Road, and dismissed the summons. A case was taken to the High Court, where the judges expressed an adverse opinion, and held that the building was in Kensington Court, a new street of less width than 50 feet. The magistrate reheard the summons, and imposed a penalty with costs, at the same time stating that if there were any future proceedings a fine of the smallest coin in the realm would be sufficient. The summons heard on Tuesday was taken out by the London County Council. Mr. Horace Avory, who supported it, stated that the building was 75 feet in height. It was a serious matter to the Council, who had instructed him to press the magistrate to enforce the Act to the fullest extent, as it was

probable that the parties were prepared to pay the penalties rather than comply with it, because it suited their pockets better. There was a penalty of 5*l.* with a continuing penalty of 40*s.* a day. There was no other remedy and no power to order the building to be pulled down. He submitted that the defendant was liable to the continuing penalties since October 15, 1892. Mr. Poole, on behalf of the defendant, argued that a builder was not liable to the continuing penalties after he had given up the building. It was given up by the defendant in February of last year, and the London County Council was acquainted with the name of the owner, but they thought it wise to go against the builder. He pointed out that it was a *bona fide* mistake, it being the first case under the Act. Mr. Horace Avory, in reply, said the person who committed the offence was liable. Mr. Curtis Bennett suggested that the defendant would have no power to pull the building down now that he had given it up. Mr. Horace Avory: He should not have put it up. In the course of the arguments, Mr. Poole said a penal notice had been served on the owner, and therefore it was likely that other proceedings would be heard at that Court. Mr. Curtis Bennett in the end adjourned the summons *sine die*.

THE TOWER BRIDGE.

A REPORT has been prepared by Colonel Haywood, the engineer to the City Commissioner of Sewers, on the references as to the sufficiency of the northern and north-western approaches of the Tower Bridge, and the desirability of acquiring ground on the site rendered vacant recently by the fire in St. Mary Axe, with the view to forming a new street in that direction. He states that with regard to a new western or north-western street from the Tower Bridge, he is of opinion that a large portion of the traffic which will cross the new bridge will be that which goes between the south-east and north-east of the metropolis, avoiding the City altogether, and thus relieving London Bridge, Gracechurch Street and Bishopsgate Street, as well as Fenchurch Street, Eastcheap, Great Tower Street and Lower Thames Street. Some carriage traffic which crossed the Tower Bridge would, however, turn westwards into the City, and it was therefore necessary to consider what were the existing streets which would accommodate that traffic. As to Lower Thames Street, Tower Street

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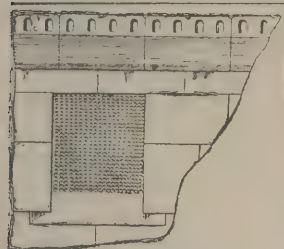
and Eastcheap, vehicles could pass by way of Postern Row and Tower Hill, and by the same line traffic could reach Crutched Friars by way of Trinity Square. Crutched Friars could also be approached by the Minorities and John Street, both of such ample width that double the present traffic passing along them could be accommodated. Fenchurch Street and Liverpool Street might be reached by the Minorities or by John Street and Jewry Street. Traffic going more northwards could do so by the Minorities and Houndsditch, which lead to Bishopsgate Street and Liverpool Street, and also by Duke Street, Bevis Marks and Camomile Street, which in recent years have been connected and widened by the Commission. The traffic in Aldgate between Fenchurch Street and the Minorities is no doubt frequently impeded, but that could only be cured by a very extensive improvement or by the formation of a new street running from Holborn right through the City north of the Bank. With these existing thoroughfares it appeared to Colonel Haywood somewhat premature to enter on the consideration of a new line of western streets from the Tower Bridge. When the bridge has been open for two or three years the extent and direction of the traffic would be ascertained, and it would be seen whether a new street was wanted or not. No doubt a street leading in a north-west direction would be of advantage, but the same remark would apply to a new street to be formed in any part of the City; nor did it follow that a new western approach street, if needed, should take the direction of the ground in St. Mary Axe recently made vacant by the fire.

THE MANCHESTER GASWORKS.

THE members of the Gas Committee of the Manchester Corporation paid a visit of inspection to the gas station in Bradford Road on Monday. The Gas Committee, it may be remembered, says the *Manchester Guardian*, recently obtained from the Local Government Board power to borrow the sum of 500,000*l.* for gasworks purposes, and of this sum it is proposed to devote to the Bradford Road station something like 114,000*l.* Inclusive of the land already built upon, the Corporation have at Bradford Road about 52 acres of land. At the time the purchase was made there were many members of the Council both in and out of the Gas Committee who doubted the wisdom of it, but now it is pretty generally agreed that the transaction has proved highly advantageous to the Corporation and the

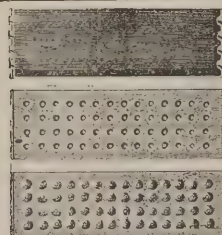
ratepayers. While the station at Rochdale Road is crowded with buildings and apparatus in a way that is, to say the least, very inconvenient, there is land enough and to spare at Bradford Road for such extensions as the increased consumption of gas may from time to time render necessary. According to the books of the Corporation the value of the Bradford Road station at the close of the last financial year was as follows, viz. :—Land, 124,963*l.*; buildings, 128,410*l.*; apparatus, 184,678*l.*; total, 438,051*l.* When the extensions now in progress and in contemplation are completed the value will, of course, be considerably increased. The extensions will bring the productive power of the station up to 8,500,000 cubic feet of gas per day, and by the erection of one additional gasholder, the largest out of London, the storage capacity will be increased from 6,000,000 to 13,000,000 cubic feet. With these and other additions the gas-making capacity of the whole of the city gasworks will be increased to 21,000,000 cubic feet and the storage capacity to 25,000,000 cubic feet.

The principal object of this visit was to inspect the stoking machinery which has been erected at the works by West's Gas Improvement Company, Limited, of Miles Platting. With the view of securing the latest and most improved machinery for stoking purposes, the Gas Committee some time ago visited the South Metropolitan Gasworks in London and other leading gasworks in the country, and as a result of their inquiries and deliberations they decided to adopt the complete plant of the West Company for one of the large retort-houses. The apparatus does not merely take the place of the hand stokers, as its name suggests, but brings the coal and cannel from the stores, breaks the material up into small pieces by four powerful machines each driven by a steam-engine, and by an ingenious automatic arrangement conveys it into the retort-house, where it charges the retorts in such a way as to secure the best result in the form of a large yield of gas. The machinery is worked by compressed air supplied by a stationary air compressor, in which there are many novel features. It is said that the total cost of the machinery is about 8,000*l.*, and if the expectations of the makers are realised this amount will be saved within the first year the machinery is in operation through the economies that will be effected. Seen in operation, it appeared to work with remarkable smoothness and efficiency. Its adoption will displace a considerable amount of manual labour, and it is satisfactory to learn that the workmen have taken to it in a friendly spirit and with every disposition to work it as well as they can.



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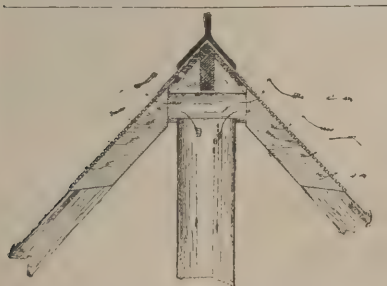
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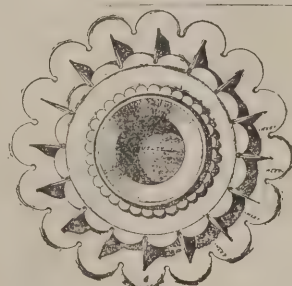


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THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the meeting of this Society on Thursday, the 4th inst., Mr. R. Nelson Boyd, M.I.C.E., F.G.S., &c., read a paper. After alluding to the formation of peat in nature, its origin, localities and characteristics, the author referred to its anti-septic qualities, and the valuable products obtained from it by destructive distillation. Its great value, however, lay in the possibility of converting it into a useful fuel. The author then described some of the machinery in use for preparing peat for fuel in different countries, and mentioned the reports made on the value of peat to Government in this country, as well as the result obtained in practical experiments on railways and steamers. Having given various analyses of peat and its products, the author described the system invented by Mr. Blunden, by which the peat is forced out of the machines used in the form of thick drain tiles or tubes. Mr. Blunden's general process was then described and the cost of his plant stated. The economic value of peat was considered, first as a fuel, secondly as to the products from it by distillation, and, thirdly, as to the coke or charcoal produced. At present the two latter have a value in the markets, as the distillation produces a fair amount of sulphate of ammonia, and the coke or charcoal has a special value owing to its freedom from impurities. It was also pointed out that eventually the large deposits of peat will have a greater value as the cost of coal increases, which it must do in course of time.

BUSINESS PREMISES, EDINBURGH.

AN excellent start has now been made with the building of the new business premises for Messrs. Charles Jenner & Co. at the corner of Princes Street and South St. David Street. The builders are already considerably above the street level with the outer walls, and the handsome polished granite pillars which form the supports of the imposing arcading of the windows, both on the south and east fronts, give already some indication of the character of the edifice which is to be reared on this prominent site. The architects have designed the building in a free Renaissance style, partaking both of the characteristics of the Jacobean architecture of England as practised by Inigo Jones and Wren, and also of the French Renaissance of the Valley of the Loire. The most striking features of the design are the shop arcading and a great octagon tower at the angle of Princes Street and St. David

Street. The arches of the shop arcade rise to a height of 22 feet above the pavement of Princes Street and on that frontage of 80 feet there are six bays. On St. David Street there are twelve bays, and the arcade becomes lower in consequence of the rise in the street northwards. The shop-windows are recessed 2 feet between the piers of the arcade, so that those looking into them may do so without being jostled by the passing traffic. The pier bases are of dark blue granite, simply moulded, and the piers themselves consist of large blocks of rich red Aberdeen granite from the Hill o' Fare Quarry, all beautifully polished. The pier capitals and the arches are in yellow freestone from Craggs Quarry, Northumberland, and are handsomely moulded and carved in the style of the building. The main doorways from Princes Street and St. David Street have deeply-recessed porches floored and lined with marble and granite, and the exteriors are pedimented and carved. The angle tower rises to a height of 120 feet above Princes Street, and is decorated with statuary upon the first and fifth floors. The second, third and fourth floors have the Orders of architecture and projecting balconies and panellings richly carved, and the tower is finished off with flying buttresses, arcaded windows, carved parapets and a stately tourelle at the north-east corner, by which access is obtained to the platform roof and flagstaff. The late Mr. Jenner, it may be recalled, bequeathed a sum of 8,000*l.* to his trustees for the purpose of suitably embellishing the exterior of the new building. It was to be a free gift, and not to be taken into account in the value of the property. He also desired the introduction of caryatides or female figures into the scheme of decoration, to show symbolically that women are the support of the house, and these injunctions the trustees are now taking steps to have carried into effect. It might also be mentioned here in connection with the description of the exterior of the elevation that, at Mr. Jenner's request, the Jacobean features introduced into the elevation have been studied by the architects from the Bodleian Tower, Oxford, a beautiful masterpiece by Inigo Jones, which Mr. Jenner saw and admired when on a visit to that city more than twenty years ago. The building throughout will be entirely fireproof. In the construction of the walls brick has been largely used in preference to stone; all the internal beams and standards carrying the various doors and roofs are of the best steel, and the floors themselves are of Portland cement concrete, faced with either marble or wood-block paving. The roofs are also of steel and concrete, covered externally with slates or Val de

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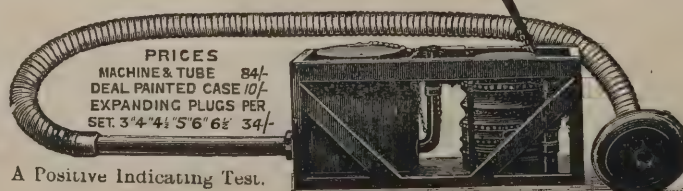
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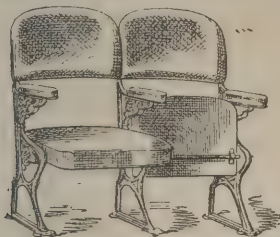
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Travers asphalt. Further, in pursuance of the same fireproof scheme, the building is divided into a Princes Street and a St. David Street block, separated from foundation to roof by a thick fireproof wall, all the openings in which are protected by fireproof doors. The staircases are also of fireproof material, those within the business premises being covered with marble, and those for the upper floors with red concrete. The Princes Street block contains a shop, 80 feet by 70 feet and 24 feet high, with a basement flat below of considerably larger size, as it extends outwards below Princes Street and St. David Street. The basement is excavated 13 feet below the street level, and is lined throughout with enamelled brickwork in harmonious shades of colour. On the west side of the shop there is a gallery floor, containing restaurant, reading-room, writing-room, parcel office, telephone-box and lavatories for the exclusive use of the firm's customers. On east side of shop there is a similar gallery floor, containing the counting-room and the partners' private rooms. The first and second floors of the Princes Street block are extensive warerooms, while the three upper floors are occupied as the assistants' boarding establishment and workrooms. The St. David Street block contains a shop fronting that street, 90 feet by 40 feet; a central hall, 90 feet by 37 feet; and a back wareroom, 82 feet by 20 feet. The central hall rises to a height of 60 feet, and has two tiers of galleries, giving access through handsome arcading to the first and second floor ware-rooms of this block. There is a grand staircase at the north end of the central hall, and the various floors of the shop, warerooms and workrooms are connected by four elevators, of which two will be used by customers and two by the employes. In addition, there will be a powerful hydraulic platform lift for taking in heavy goods from Rose Street, and a hydraulic crane for taking furniture to the upholstery department. The four upper floors of the St. David Street block will be occupied as the assistants' boarding establishment, while the Rose Street block to the back will be occupied as workrooms. The whole establishment will be lit with the electric light, and will be heated and ventilated upon a general system, under which it is anticipated that not only will warm fresh air be supplied in winter, but that fresh air artificially cooled will be supplied to the warerooms and workrooms during hot summer weather. The architects for the new building are Messrs. George Beattie & Son, Edinburgh. The contractors for the mason and brick-work are Messrs. James Young & Son, Polwarth Terrace; the steelwork, Messrs. Mather & Son, Fountainbridge; the fire-proof work, Stuart's Granolithic Company, London; the granite

work, Mr. Wm. Keith, jun., of Aberdeen. The other contracts are not yet settled. If the winter is a reasonably open one, it is anticipated that Messrs. Jenner & Co. may be in possession of their shop premises before the end of 1894.

MUNICIPAL UNDERTAKINGS IN LEEDS.

NOWHERE in the county, says the *Leeds Mercury*, is the future being more confidently anticipated than in its chief industrial centre. The remarkable growth of Leeds during the last thirty or forty years still characterises the city. Even in the darkest hour of the recent depression expansion was manifest, and, as in former periods of adversity, Leeds has suffered less than perhaps any other part of the country. Everything seems to indicate that the city is destined to hold its present position among the great towns, advance as they may, if not to take a higher one. Such being the case, the Corporation cannot, if it would, fold its arms. On the contrary, strenuous efforts are demanded of it. The remarkable development has exceeded its powers of achievement, and it has considerable work to do ere it can say that the altered conditions are fulfilled. The task requires keen appreciation of public needs, and the difficulty is all the greater because what will suffice to-day will, in all probability, be totally inadequate a short time hence. Improvements, if they are wisely designed, must therefore be carried out on a comprehensive scale. They are of two kinds—those required in the interests of health, and those which must be made if the Corporation is to facilitate and direct the development which comes from industry, enterprise, advantageous situation and the like. Neglect with reference to the principal thoroughfares has made the burden of to-day much heavier than it would have been otherwise. The city fathers in the past were easy-going men. What was probably less to their discredit, they did not foresee that almost within the span of a life their big village would become a great city. On no other ground can one account for so many narrow, irregular thoroughfares, and the absence, amongst the older ones, of anything stately and gratifying to the eye. The children must atone for the shortcomings of the fathers, and one of several important works which the Corporation is taking up is the widening of some half-dozen of the chief arteries of the city. These are Duncan Street, Vicar Lane, North Street, Meadow Lane, Park Lane and Lands Lane. The last-mentioned, which has been in hand a long time, is



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partly done. There are many other improvements of a like character which might have been more advantageously carried out, but if only for the sake of obliterating a piece of patch-work, which has entailed a considerable outlay that is yielding no adequate return, and which is satisfactory from no other point of view, the widening of the street ought to be finished without further delay. The tinkering in Lands Lane will have been of some good, however, if it convinces the Corporation of the folly of such a policy. The North Street, Vicar Lane and Duncan Street widenings are essential to a good tramway service. That is to say, the cars ought to enter the city from the Chapel Town and Meanwood sections by that route, and leave by way of Briggate. There are other considerations, such as the extension of the markets at some future time and the clearance of insanitary property in the district, which it may also be well to bear in mind in connection with this most important part of the street projects. All these may not be commenced during the year. There is, no doubt, much to be said in justification of the policy. If expectations are realised a good deal of work will be begun almost immediately.

Then there is the laying out of City Square, in front of the new General Post Office. The year should see that accomplished, though nothing has yet been decided as to how it is to be done. It is intended to cut off the wedge-shaped corner of Wellington Street and Quebec Street, so as to open out the square to Aire Street, and probably that will precede the laying out, though it need not necessarily do so.

The overhauling of the tramways will form an important part of the work of the Corporation during the year. The transfer of the undertaking, now that an agreement between the Corporation and the Tramways Company has been effected, cannot be much longer delayed. Then will commence, no doubt, the relaying of the sixteen miles of the track. The system of traction to be adopted is still under consideration. It is almost safe to say, however, that electricity will be the motive power, and if so, that will entail the early erection of the station and the laying down of the necessary plant. It is difficult to conceive of anything which will contribute more effectively to the development of the city than a well-organised tramway system. During many years no project has more thoroughly tested the business capability of the Corporation than this one will do, and it is encouraging to find that the character of the enterprise is being recognised.

The schemes already noticed would be a sufficient tax upon the energy and judgment of the city fathers, but there are

other and no less important duties to which they must as promptly give attention. The West Riding Conservancy Board intends to discharge its responsibilities, which means that every city, town and village that has hitherto been polluting the rivers and other watercourses of the Riding will have to cease doing so. This alone will account for no small part of the present activity of the sanitary authorities, and the enforcement of the law relating to the matter will undoubtedly entail a very large expenditure throughout the Riding. In Leeds more extensive sewage works must be provided. It is intended to have a sewage farm at Rodley, and the main sewers on that side of the borough will have to be carried thither. This will obviate the fouling of the canal in that district, which the Canal Company are not disposed longer to tolerate. But the Rodley Farm will not nearly meet the requirements. It will only take the sewage of about 20,000 inhabitants—a mere drop in the bucket. How is the remainder of the sewage of the city, whose population is fast approaching 400,000, to be dealt with? It is no secret that the works at Knostrop are insufficient. And this is not the gravest part of the situation. Any scheme of sewage purification adopted must be such as will meet the requirements of Leeds when its population is much larger than at present, for, as will be readily understood, land in the district suitable for the purpose is a rapidly declining quantity. It is extremely doubtful whether it would be wise to extend the Knostrop works. What has happened again and again when the river was in high flood indicates that their location is not a good one. The matter is now under consideration, and we shall doubtless learn more about it before long, for it is one that cannot be deferred. It may be assumed, however, that the carrying out of any adequate scheme, whether for the treatment of the sewage on the Knostrop system, or on some extensive tract of agricultural land at a distance, will entail a very large expenditure.

Some extensions of the waterworks must also be undertaken in order to make provision for the increasing requirements of the city. The construction of one of the large service reservoirs projected some time ago will in all probability be undertaken during the year. This will be situated at Harehills, opposite the Gipton Inn. Plans and estimates for it are about to be submitted to the Waterworks Committee. The repair of Eccup reservoir is still affording work for several hundreds of men, and a year or two more must elapse ere the engineering mistake in the construction is remedied. It will thus be seen that the Leeds Corporation has its hands full.

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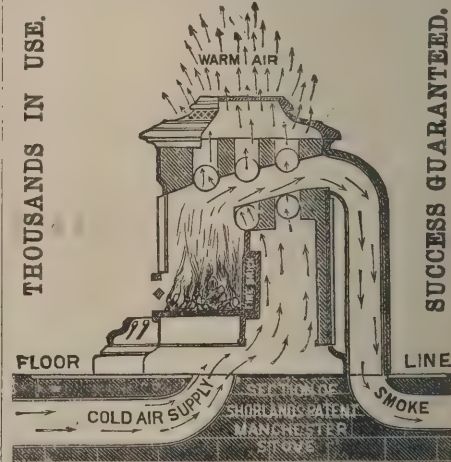
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MANCHESTER.

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THE SCOTTISH PIG-IRON TRADE.

IN their annual report on the pig-iron trade, Messrs. William Jacks & Co. write :—For the year which has just opened, the prospects of the pig-iron trade do not seem to us to be particularly bright. Scotch warrants are again in a somewhat abnormal position. Just before the coal strike in the Midlands began, two or three operators bought large quantities of Scotch warrants in the expectation, it is supposed, that the outbreak of the strike would be followed by an advance in price. This expectation was not realised, but the holders have since supported the market by adding continually to their purchases, with the result that while Cleveland and hematite stand at exactly the same as at the commencement of the strike, Scotch warrants are more than a shilling higher. In consequence of this Scotch warrants have become too dear to be employed by consumers, as is proved by the fact that though since the Midland strike began, nearly six months ago, no G.M.B. iron has been made in Scotland, yet the total withdrawals during these months from Connal's stores have amounted only to about 15,000 tons, and of this a very large portion was not, properly speaking, G.M.B. iron at all, but consisted of Carnbroe, Almond, and one or two other superior brands, of which only a few thousand tons altogether now remain in store. Scotch warrants are, in fact, now in exactly the same position in which they stood when the London syndicate maintained the price for so many months at 47s., for though the actual price is lower the relative price, compared, that is, with Cleveland and hematite, is higher now than then; and it seems obvious that Scotch warrants can have no interest except as speculative factors until either Cleveland and hematite have advanced or Scotch have fallen to a figure which will enable the iron to come again into consumption. Leaving, however, the special position of Scotch warrants out of view, what is the outlook for the pig-iron trade as a whole? During the last month or two a more hopeful feeling has sprung up in regard to the future of pig-iron prices; but this feeling is based not so much upon any belief that trade is improving—for statistics seem to show that business in all branches of the iron trade is still unfortunately contracting rather than expanding—as upon the hope that higher prices may be expected on account of, first, the cost of production, and second, the smallness of the stocks.

1. The high cost of production, when, as is the case at present, it is sufficiently serious to limit the make, has undoubtedly a most important effect upon prices; but it must

not be forgotten that the high price of coal, while it tends to diminish the production, tends at the same time, and in at least an equal degree, to diminish the consumption of pig-iron. In illustration of this we would point to the present position of the steel trade. The price of steel for shipbuilding is now about 7s. 6d. per ton cheaper than in 1886, the year when prices were at the lowest point which, before the present period of depression began, had ever been touched; but in 1886 hematite was being delivered at the Scotch steel works at from 5s. to 6s. per ton cheaper than the present price. Serious, therefore, as the high cost of production is for the ironmaster, it is still more serious for the steelmaker, who suffers in an equal degree from the dearthness of coal, and is at the same time handicapped by the very high price which, in comparison with what he can get for his steel, he has to pay for his pig-iron. It is not, however, by diminishing the home consumption only that the high cost of production adversely affects the demand for pig-iron. The present prices of British pig-iron, though in themselves moderate, are very high when compared with the prices of German, French and Belgian irons, which compete with us on the Continent, and therefore until our prices fall, or the prices of our competitors materially advance, we can hardly look for any improvement in the foreign demand.

2. The smallness of stocks, it seems to us, is scarcely an argument in favour of an advance in price. It is rather a ground for expecting that when an advance does take place it will be both rapid and important. So long as the production of pig-iron equals the consumption, the surplus stock is not required, and it is of comparatively little importance whether it be small or large. In estimating, therefore, the extent to which prices are likely to be influenced by the smallness of the stock, the important thing to consider is whether the stock will probably increase or diminish; and, looked at from that point of view, we must say that we can see no reason for expecting that the stock of pig-iron during the coming year will grow smaller. Last year, in spite of the strikes which so seriously interfered with the production, the stock of pig-iron in the three districts—Cleveland, Scotland and Cumberland—combined increased to the extent of 108,000 tons, without taking into account the increase, which must have been very considerable, in the stock of the hematite in the Cleveland district, as well as in the Cumberland rail works, and during the coming year we see nothing to prevent that increase from continuing. Of course, we quite realise that the position often

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changes very quickly, and if trade were to improve, the smallness of the stocks, both in the public stores and in the consumers' yards, would do much to cause a rapid advance; but, as far as we can judge them, the present indications do not point to an early revival in trade, and we fear it will be some time yet before we come to an end of the present period of depression.

Messrs. R. Feldtmann & Co. write:—The year which has just closed ranks among the most unfavourable in the commercial history of this country, and will be a memorable one from the numerous causes which have contributed to aggravate the already existing severe strain of depression in almost every branch of business. The financial panic in Australia, the silver crisis in the United States, the continued "money famine" in the South American Republics, the intestine war in Brazil, and last, but not least, the numerous and determined struggles between capital and labour in the coal trade of this country, entailing losses, suffering and dislocation of all our staple trades—all these have had a most serious effect on the commerce of the country, and more particularly on the iron and steel trade. The latter is not only one of the most important of our industries, but also one of the most sensitive to external influences—the first to grow and develop in the sunshine of prosperity; the first likewise to wither and droop on the approach of clouds of adversity. But there are still other causes which have militated against our trade; the large market we used to find for our iron products in the United States is now, except under abnormal conditions, practically closed to us, as, fostered by protective tariffs, the Americans have largely developed their own vast natural resources of coal and iron, and are now able to fully supply their own wants. On the continent of Europe, too, our markets have been considerably curtailed by high protective tariffs, which, however onerous to the countries choosing to tax themselves thus, have enabled them at least to build up big iron and steel industries, capable of not only supplying their own requirements, but even of sending some of their surplus manufactures to our markets, and, as a consequence, seriously injuring our export trade in these materials. The closing of so many of our old outlets has not yet been counterbalanced by the opening up of new markets on a large scale, and, as a result, all classes of the community are at present suffering. Having nothing to offer foreign nations as a *quid pro quo* for a reduction of their import duties, our hope of commercial salvation must lie principally in the development of railway construction in

India, Burmah and South Africa, especially the latter. The main feature in favour of the iron trade at present is that stocks are low and prices moderate, so that we may confidently look for an immediate favourable influence on our market when the first promising symptoms of revival appear.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 24825. George Oulton, for "Improvements in or connected with nozzles and valves."
- 24828. Alfred Lovekin, trading as Rea & Neale, for "An improved spanner or wrench."
- 24832. Thomas Garforth Rhodes, Fred Rawson and Raymond Gaunt, for "An improved valveless syphon for draining cisterns, tanks and the like."
- 24834. Richard Leopold Kirelew, for "Flues, ventilating and chimney shafts."
- 24852. Mark Bartlett, for "Improvements in grates of register stoves and other stoves."
- 24887. Honor Georgina Basset, for "Improved measuring device or gauge."
- 24971. Ernest Gilby Allison, for "An automatic closing and retaining valve."
- 24981. Thomas Saunders and Thomas Haddon, for "Improvements in the construction of lock and latch staples."
- 25037. Thomas Downie, for "Improvements applicable to window-sashes."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co. Patent Agents, 37 Chancery Lane, London W.C.

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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

COMPETITIONS OPEN.

EAST GRINSTEAD.—Jan. 31.—Designs are invited for an Isolation Hospital. Premium £5 5s. Mr. W. Alsten Head, Clerk to the Union Sanitary Authority.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLETH.—Feb 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

RUNCORN.—Jan. 19.—For Water Supply Schemes. Premium of 5l. Mr. John Ashton, 71 High Street, Runcorn.

SOUTHEND-ON-SEA.—Jan. 31.—For Designs for Shelters, Sea-baths, Photographic Studio and Shops. Mr. W. Gregson, Town Clerk, Southend.

CONTRACTS OPEN.

ABERDEEN.—Jan. 24.—For Additions to Stable Offices, Breda, Alford. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

ALNWICK.—Jan. 24.—For Additions to Star Hotel. Mr. G. Reavell, jun., Architect, Alnwick.

BELFAST.—Jan. 23.—For Building Six Houses and Shops. Messrs. Young & Mackenzie, Architects, 7 Donegall Square East, Belfast.

BELFAST.—Jan. 24.—For Building Public Baths. Mr. Robert Watt, Engineer, 77A Victoria Street, Belfast.

BLACKBURN.—Jan. 29.—For Building Pauper Lunatic Asylum. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BOWNESS.—Jan. 24.—For Building Residence. Mr. Stephen Shaw, Architect, Kendal.

BRADFORD.—Jan. 23.—For Building Four Through Houses and Shop, House and Stabling. Mr. J. H. Holmes, Architect, Dudley Hill, Bradford.

CAMBERWELL.—Jan. 22.—For Paving Varcoe Road, Dulwich. Mr. C. William Tagg, Vestry Hall, Camberwell.

CARDIFF.—Jan. 27.—For Extension of Board School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

CARISBROOKE.—Jan. 29.—For Building Boundary Walls for Extension of Cemetery. Mr. W. C. Way, Surveyor, Newport, Isle of Wight.

CHELSEA.—Jan. 25.—For Supply of Materials and Execution of Works for a Period of Twelve Months. Mr. Thomas Holland, Town Hall, King's Road, Chelsea, S.W.

CHELTHENHAM.—Jan. 23.—For Supplying Electric Lighting Machinery. Mr. Joseph Hall, C.E., Municipal Offices, Cheltenham.

CHELTHENHAM.—Jan. 24.—For Laying Pipe Sewers and Works in Connection. Mr. Rowland Ticehurst, Clerk to the Rural Sanitary Authority, Essex Place, Cheltenham.

CONGLETON.—Jan. 27.—For Building Infant School. Mr. J. M. Bannerman, St. Stephen's Vicarage, Congleton.

CORK.—Jan. 29.—For Building Wesleyan Church and Sunday Schools at Barrackton. Mr. Robert Walker, Architect, 17 South Mall, Cork.

CRADLEY.—Feb. 9.—For Building Police Station, Cells, &c. Mr. Henry Rowe, County Surveyor, Worcester.

DEWSBURY.—Jan. 31.—For Construction of Embankments, &c., for Forming Two Reservoirs. Mr. G. H. Hill, Engineer, 3 Victoria Street, Westminster.

DONCASTER.—For Building Co-operative Stores. Mr. H. Athron, Architect, Dolphin Chambers, Doncaster.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

DOVER.—Jan. 22.—For the Erection of New School of Art Science and Technology. Mr. E. Wollaston Knocker, Castle Hill House, Dover.

DRAX.—Jan. 23.—For Rebuilding School and Alterations to others. Mr. H. B. Thorp, Architect, Goole.

FELIXSTOWE.—Jan. 19.—For Building Five Dwelling-houses for the Coastguard. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

GLASGOW.—Jan. 22.—For the Various Works in Building Family House, St. Andrew Street. The City Engineer, 64 Cochrane Street, Glasgow.

GOLBORNE.—Jan. 29.—For Building Methodist Chapel. Mr. W. Graham, 121 Leigh Street, Golborne.

HANLEY.—Jan. 29.—For Electric Light and Fittings for Corporation Buildings. Mr. Joseph Lobley, Borough Engineer, Town Hall, Hanley.

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TRADE MARK



TRADE MARK

HASTINGS.—Jan. 22.—For Supply of Cast-iron Water Mains. Messrs. Jeffery & Skillier, 11 Wellington Square, Hastings.

HORSHAM.—Jan. 31.—For Building Police Station and Weights and Measures Office. Mr. C. Adcock, County Surveyor, 5 Queen's Square, Bognor.

KENDAL.—For Building Business Premises and Alterations to House. Mr. J. Thompson, Architect, 8 Lowther Street, Kendal.

LEEK.—Jan. 26.—For Additions to Boys' School. Mr. J. G. Smith, St. Edward Street, Leek.

LITTLE HARWOOD.—For Building Infants' School. Mr. J. W. Shorrocks, Architect, 3 Simmons Street, Blackburn.

LLANDUDNO.—Feb. 5.—For Bench of Retorts. Mr. E. P. Stephenson, Engineer to the Improvement Commissioners, Llandudno.

LLANDUDNO.—For Proscenium and Decoration of Pavilion and Supply of Tip-up Seats. Mr. A. Conolly, Church Walks, Llandudno.

MACCLESFIELD.—Jan. 22.—For Building Isolation Hospital. Mr. Stanhope Bull, County Surveyor, 84 Northgate Street, Chester.

MANCHESTER.—Jan. 25.—For Construction of Intercepting Sewers (2,445 Yards of Brick Sewer). Mr. J. Allison, City Surveyor, Town Hall, Manchester.

MANCHESTER.—Jan. 31.—For Building Stores, Show-room and Workshop. Mr. C. Nickson, Superintendent of the Gas Department, Town Hall, Manchester.

MANGOTSFIELD.—Feb. 6.—For the Construction of Main Outfall and Branch Sewers, Precipitation Tanks and Filter Beds, Erection of Sludge Pressing Buildings, Chemical Stores and Erection of Sludge-pressing Plant and Mixing Machinery. Mr. S. F. Andrews, Keynsham Union, Keynsham.

MARLBOROUGH.—Jan. 26.—For Providing and Laying Cast-iron Water Mains, Irregular Pipes, Valves, Hydrants and Consumers' Service Pipes. Mr. Ed. Llewellyn Gwillim, Town Clerk, Marlborough.

NEWPORT, ISLE OF WIGHT.—Jan. 23.—For Building an Asylum at Whitecroft. Mr. B. S. Jacobs, Architect, 88 Bishopsgate Street Within, E.C., and Hull.

NORTH-EASTERN RAILWAY.—Jan. 24.—For Goods Warehouse, Felling. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

ORMSKIRK.—Jan. 23.—For Building Engine-shed. The Engineer, Hunt's Bank, Manchester.

PONTYPRIDD.—Jan. 20.—For Constructing Brick Gas-holder Tank. Mr. Thomas Newbigging, Engineer, 5 Norfolk Street, Manchester.

PORTSMOUTH.—Jan. 30.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

RAMSGATE.—Jan. 29.—For Removal of Albion Hotel. Mr. H. B. Hammond, Clarence Baths, Ramsgate.

ROMFORD.—Jan. 18.—For the Supply of 900 Tons of Blue Guernsey Granite and 400 Tons of Belgian Granite. Mr. Geo. Bailey, Local Board Offices, Romford.

SALFORD.—Feb. 5.—For the Erection of a Higher Grade School in Victor Street. Mr. Ogilvie Duthie, School Board Offices, Salford.

SHEPTON MALLET.—Jan. 24.—For Constructing Reservoirs, &c. Mr. H. A. Budd, 27 Peter Street, Shepton Mallet.

STEVENTON.—Jan. 24.—For Building School and Teacher's Residence. Mr. J. Gibson, Architect, New Street, Basingstoke.

STROOD, KENT.—Feb. 1.—For Supply of Convertible Iron and Deal Tables, for the Dining-hall of Union Workhouse. Mr. G. Wilkinson Prall, Clerk's Office, Strood Union, Kent.

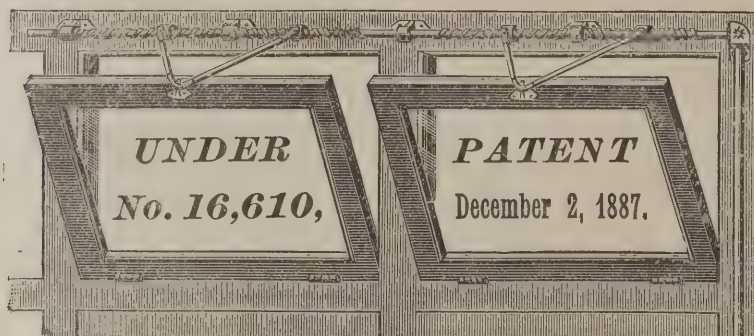
THURSO.—Jan. 27.—For Construction of Pier at Island of Strom and at Dwarwick Head. Mr. James Barron, Engineer 7 Union Terrace, Aberdeen.

WALTHAMSTOW.—Jan. 24.—For the Erection of Public Library Buildings. Mr. Gilbert Houghton, Town Hall, Walthamstow.

WALTON-ON-THAMES.—Jan. 29.—For Laying-out, Enclosing and Draining a New Cemetery, with the Construction of Stoneware Pipe Drains and Sewer. Mr. W. F. Vinter, A.M.I.C.E., 3 Little George Street, Westminster.

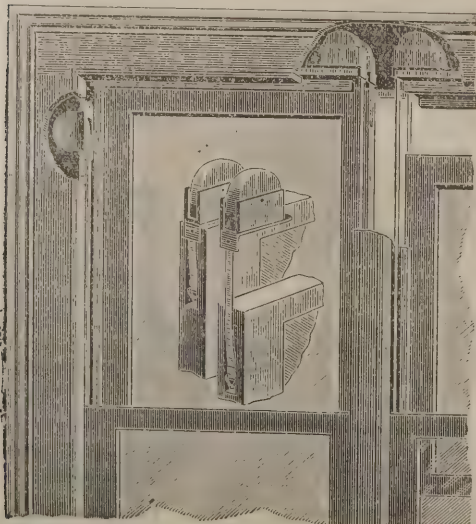
WANDSWORTH.—Jan. 22.—For Extension of Works and Supply of Materials in the Various Parishes in Wandsworth District for One, Two or Three Years. Mr. Henry George Hills, Clerk to Board of Works, East Hill, Wandsworth.

WATERVILLE, Co. KERRY.—Jan. 30.—For Building Coast-guard Station. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.



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B. E. Nightingale, Albert Embankment	12,939	0	0
F. J. Coxhead, Leytonstone	12,787	0	0
W. Shurmur, Clapton	12,780	0	0
W. Maddison, Canning Town	12,739	0	0
Harris & Wardrop, Limehouse	12,469	0	0
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Estimate No. 1.

	A.	B.
G. Bowles, Colchester	£1,397	0 0
H. Everett & Son, Colchester	1,360	0 0
F. G. Bloice, Colchester	1,320	0 0
C. E. Orfeur, Colchester	1,300	0 0
F. Shead, Colchester	1,295	0 0
F. Dupont, Colchester	1,270	0 0
G. Dobson, Colchester	1,250	0 0
W. Chambers, Colchester	1,249	0 0
R. Beaumont, Colchester	1,236	0 0
A. Diss, Colchester	1,115	0 0

A. For a Brick Wall.

B. Extra if Portland Cement Mortar and Concrete.

Estimate No. 2.

	A.	B.
C. E. Orfeur, Colchester	£1,295	0 0
F. Shead, Colchester	1,278	0 0
F. Dupont, Colchester	1,258	0 0
F. G. Bloice, Colchester	1,250	0 0
G. Bowles, Colchester	1,247	0 0
R. Beaumont, Colchester	1,185	0 0
H. Everett & Son, Colchester	1,160	0 0
G. Dobson, Colchester	1,140	0 0
W. Chambers, Colchester	1,120	0 0
A. Diss, Colchester	1,018	0 0

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B. Extra if Portland Cement Mortar and Concrete.

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T. Linshill, Harrogate, joiner	1,200	18	8
Slater & Sons, Leeds, plumber	316	7	10
Wm. Pennington, Leeds, plasterer	221	9	8
J. Shepherd, Harrogate, slater	77	10	0

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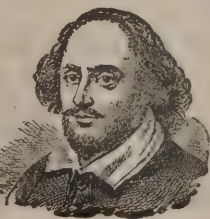
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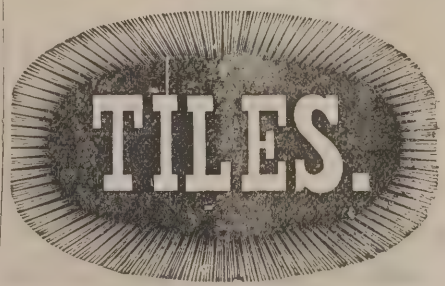
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EDMONTON.

For the Erection of Fire Escape Bridges at the Strand Union Workhouse, Silver Street, Upper Edmonton, for the Guardians of the Strand Union. Mr. WILLIAM S. CROSS, Architect, 18 Outer Temple, Strand. Quantities by Mr. BERNARD SWINSTEAD.

Lion Foundry Company, Queen Victoria Street	£2,824	13	7
Hall, Beddall & Co., Waterloo Bridge, S.E.	2,560	0	0
West Hampstead Foundry Company	2,498	7	10
Howard & Co., Russell Street, W.C.	2,470	0	0
McLachlan & Son, Duke Street, W.C.	2,392	0	0
T. W. Cole, Burdett Road, E.	2,359	0	0
G. Double, Ipswich	2,307	0	0
Handyside & Co., Queen Victoria Street	2,250	0	0
Jukes, Coulson & Co., Clement's Lane, E.C.	2,248	0	0
St. Pancras Ironworks Company, Euston Road	2,230	0	0
Constructional Ironworks Company, Bow, E.	2,210	0	0
Patman & Fotheringham, Theobald's Road	2,159	0	0
Clark, Bunnett & Co., King Street, E.C.	2,135	13	4
H. Young & Co., Pimlico	2,038	0	0
J. & F. MAY, High Holborn (accepted)	1,950	0	0

GREAT YARMOUTH.

For Building Electric-lighting Central Station. Mr. J. W. COCKRILL, Borough Surveyor, Great Yarmouth. Quantities by the Borough Surveyor.

M. Barnard, Southtown	£3,656	0	0
R. Eastoe, Yarmouth	3,346	17	0
G. T. Flaxman, Yarmouth	3,124	10	0
T. Howes, Yarmouth	3,093	0	0
G. Beckett, Yarmouth	2,858	10	0
Carter & Wright, Yarmouth	2,817	0	0
F. Grimble, Yarmouth	2,800	0	0
G. W. Beech, Yarmouth	2,768	10	0
T. F. W. BRAY, Yarmouth (accepted)	2,626	0	0
W. Cork, Yarmouth	2,510	0	0
J. W. Rand, Yarmouth (withdrawn)	2,485	0	0

GREENOCK.

For the Re-causewaying Cathcart Square. Mr. A. J. TURNBULL, Burgh Engineer, Greenock.

W. Steel, Greenock	£496	0	2
W. Lang, Gourrock	411	5	0
R. AITKENHEAD & SONS, Greenock (accepted)	320	7	4
Engineer's estimate	355	0	0

GREENOCK—continued.

For Improvement Works, East Crawford Street. Mr. A. J. TURNBULL, Burgh Engineer.

W. Steel, Greenock	£162	1	6
R. Aitkenhead & Sons, Greenock	150	7	9
W. LANG, Gourrock (accepted)	147	4	2
Engineer's estimate	155	0	0

HAYWARD'S HEATH (SUSSEX).

For Construction of 1,143 Yards of 9-inch Pipe Sewer and other Works, at the East Sussex County Lunatic Asylum, Hayward's Heath. Mr. HENRY CARD, County Surveyor, County Hall, Lewes.

J. Neave, Forest Hill	£2,848	0	0
Holman & Co., Brighton	2,089	0	0
G. E. Chapman, Newhaven	1,694	0	0
Box & Turner, Ardingley	1,596	0	0
E. Steed, East Grinstead	1,499	0	0
J. R. Hunt, Hayward's Heath	1,404	0	0
P. Peters, Horsham	1,300	0	0
W. H. Wheeler, Southwark	1,255	0	0
M. S. Kitteringham, Sonning	1,193	0	0
D. Porter, New Cross	1,175	0	0
W. Meats, Sandgate	1,136	0	0
H. J. SMITH, Maidstone (accepted)	1,096	0	0

ILFORD.

For Road Improvement Works, Ilford. Mr. P. WAKINS, Surveyor.

Lagdon & Crawford, Canning Town	£4,500	0	0
J. Jackson, Plaistow	4,439	0	0
T. Adams, Wood Green	4,345	0	0
W. Griffiths, Kingsland	4,335	0	0
J. Burrill, Manor Park	4,062	0	0
D. T. Jackson, Barking	3,889	0	0
R. STROUD, Ilford (accepted)	3,532	14	6

LIVERPOOL.

For Heating St. Alphonsus's New Schools, Stanley Road. JOHN METCALF (accepted).

LONDON.

For Heating Convent of the Holy Child, Cavendish Square. JOHN METCALF (accepted).

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LONDON—continued.

For the Erection of a New Landing-stage at Hammersmith Bridge, for the County Council.		
R. & H. Green	£2,260	2 6
G. Double	1,664	6 5
For Refreshment-house at Parliament Hill, for the County Council.		
E. J. Raybould & Co.	£655	0 0
L. Faulkner & Sons	591	0 0
Hill & Smith	528	16 5
W. Parham	527	0 0
M. McKey	499	17 9

For Supply and Erection of Dwarf Wire Fencing at Battersea Park, for the County Council.		
M. Patrick & Son	£1,553	0 0
W. Smith	1,400	0 0
C. Godbolt	1,380	7 3
F. Gough & Co.	1,258	0 0
W. Gibbin & Son	1,238	16 8
Howard & Co.	1,232	0 0
H. Eddy	1,222	8 9
H. Wall & Co.	1,197	9 0
J. H. Newman	1,195	0 0
Stimpson	1,180	0 0
S. Hipwell	1,158	10 4
W. J. Ballard	1,087	1 8
J. W. Miller	1,078	0 0
A. Wallis	1,059	1 11

LUTON.

For Paving and Other Works, Luton. Mr. T. R. ROSCOE, C.E., Borough Surveyor.		
<i>Pondwicks Road.</i>		
G. Wimpey & Co., Hammersmith	£662	5 0
Victoria Stone Company, Limited, Kingsland	582	2 0
T. Adams, Wood Green	576	6 7
A. T. Catley, London	541	18 4
G. Kingham, Luton	522	0 0
W. Lee, High Wycombe	424	8 4
<i>Bury Park Road.—Section No. 1.</i>		
A. T. Catley	1,308	11 8
G. Wimpey & Co.	1,275	0 0
G. Kingham	1,218	15 0
T. Adams	1,198	14 1
W. Lee	994	10 0

LUTON—continued.

<i>Bury Park Road.—Section No. 2.</i>		
G. Wimpey & Co.	£525	0 0
Victoria Stone Company, Limited	502	12 6
T. Adams	475	14 5
A. T. Catley	471	18 4
G. Kingham	436	5 0
W. Lee	387	4 4

A. W. Perryman, 3s. 11d. per super yard.

Waldeck Road.

G. Wimpey & Co.	368	0 0
Victoria Stone Company, Limited	353	18 4
A. T. Catley	332	0 0
G. Kingham	328	10 0
T. Adams	311	10 0
W. Lee	279	1 4

NEWBURY.

For Supply of 800 Tons of Cast-iron Pipes, Diameter from 9 inches to 16 inches, Newbury, for the Town Council.		
Staveley Coal and Iron Company	£4,286	19 0
Oakes & Co., London	3,747	5 0
Clay Cross Company, Chesterfield	3,591	6 8
Cochrane & Co., Dudley	3,462	17 0
Stanton Iron Company	3,237	12 9
ROBERTS & Co., West Bromwich (accepted)	3,202	0 10

LEAMINGTON.

For Construction of Service Reservoir in Brick and Concrete of 100,000 Gallons Capacity, Providing and Laying Pipes, Valves and Hydrants. Mr. W. DE NORMANVILLE, Engineer.		
S. Hipwell, Wisbech	£2,010	0 0
Caffin, Milverton	1,956	3 0
Woods & Currie, Northampton	1,741	11 3
J. Biggs, Birmingham	1,572	0 0
Porter & Harrison, Aldershot	1,569	0 0
BOWEN, Leamington (accepted)	1,492	0 0
Jenkins & Son, Leamington	1,460	0 0
C. A. Walker, Grimsby	1,423	10 0

SALFORD.

For Heating Guard-room and Cells, Salford Barracks.		
JOHN METCALF (accepted).		

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PARKSTONE.

For Works, Queen's Grove Road, Parkstone. Mr. JOHN ELFORD, Borough Surveyor, Poole.

W. Guy, Parkstone	£189	2	0
G. T. Budden, Parkstone	157	0	0
T. C. Rigler, Poole	156	0	0
W. BRIXEY, Parkstone (accepted)	139	0	0

POOLE.

For Heating Guildhall by Hot Water, for the Town Council. Mr. J. ELFORD, Borough Surveyor.

T. C. Williams & Son, Reading	£153	10	0
W. Parham, Bath	143	17	0
W. Wheeler, Parkstone	120	0	0
Boone & Giblett, Poole	117	10	0
Bayley & Sons, Poole	111	10	0
BACON & Co., Poole (accepted)	99	10	0

WOLVERHAMPTON.

For Building Electric Lighting Station, Wolverhampton. Mr. A. PAULL BREVITT, Architect, Wolverhampton. Quantities by the Architect.

Henry Willcock, Wolverhampton	£4,985	0	0
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ELECTRICAL.

At the meeting of the Southampton Harbour Board it was reported that the two electric cranes now being fitted on the Town Quay were completed, and had stood all tests. These are the first of the kind ever erected in any part of this country, and are an improvement on those now in use at Hamburg. The total cost of the cranes amounts to 2,480*l*. It was unanimously agreed to light the Town Quay and offices with electricity instead of gas, as at present.

THE sub-committee of the Edinburgh Town Council in charge of the matter of electric lighting in the city have accepted an estimate for the removal of the buildings on the site of the proposed supply station to be erected at Torphichen Street, and generally approved of the plans for the station submitted by the burgh engineer. The plans show a building of considerable extent in the Renaissance style of architecture, so far ornate as considerations of economy will allow.

TRADE NOTES.

THREE tenders have been received by the Sedbergh Rural Sanitary Authority for the construction of outfall sewers and sewage-disposal works at Sedbergh, in Yorkshire. The tender of Messrs. Brassingham Bros. & Carney, of Settle, in Yorkshire, amounting to 1,973*l*., has been accepted. The works consist of a small sewage farm and outfall sewers following the contours of the hilly ground. Several brooks and springs which entered the old sewers are to be disconnected from the system, so as to reduce the quantity of sewage to a minimum. The engineer to the works is Mr. W. H. Radford, C.E., of Nottingham, and his estimate was 2,478*l* 8*s*., so that there has been a considerable saving on the estimate.

THE Kilmarnock Water Committee have been empowered to accept offers for the laying of piping in connection with extensions, and to borrow 10,000*l*. to carry out the work.

AT the municipal meeting, Dunblane, a correspondence was read between the engineer and the contractor for the drainage, the contractor claiming 4,551*l*., while the engineer would only certify for 4,087*l*. Rather than go to arbitration the Commission agreed to offer 125*l*. above the engineer's statement, but it was to be without prejudice.

VARIETIES.

WE have received from the Rugby Portland Cement Company a calendar mounted on a large card in bold style, which should prove useful for hanging on office walls. Each monthly sheet has on the reverse side a calendar for the whole year of 1894 and also 1895, with postal information in addition. There are also several pages of "Facts in regard to the use of Portland Cement worth Keeping." The card on which the calendar is mounted gives ten views, showing a general view of the works, parts of the quarry, working operations, laboratory, test room, kilns and their working, pump houses and inclined tram line, fitters' shop and a general view of the quarry. The geological section across the country from Holyhead to Dover is also delineated.

THE *Leeds Mercury* says:—Under the grant of the Leeds City Council for technical instruction, arrangements have been made for two courses of four lectures, each to be delivered in the Fine Art Gallery, on Thursday evenings, from January 18

"SPHINX" PORTLAND CEMENT.



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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"ECLIPSE" PORTLAND CEMENT. Quick-setting; test, 3 parts. Standard Testing Sand, 250 lbs. per square inch. 28 days. The finest, most plastic, best sand-carrying and cheapest Cement in the market.

Specially adapted for laying encaustic tiles, making joints in sanitary pipes, internal stucco, concrete foundations, &c.

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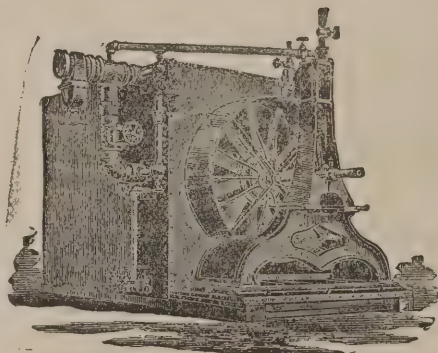
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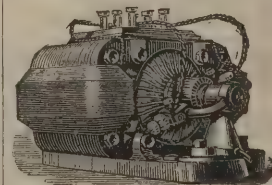
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SILVER MEDAL, PARIS, 1881.

ESTIMATES FREE.



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to March 8. The first course, commencing on January 18, will be given by Dr. J. B. Cohen, of the Yorkshire College, on "The Air of Towns," and will comprise (1) close rooms; (2) smoke; (3) town fog; (4) the germs of the air. The second course, commencing February 15, will be delivered by Mr. Frank Suddards, also of the Yorkshire College, on "Pictorial Art," comprising (1) pictures, and how to understand them; (2) characteristics of modern art; (3) the influence of nature on art; (4) mural pictures and fresco paintings.

THE building of the great tower at Wembley Park, London, is so far advanced that the legs of the structure are now finished, and the steel work rises to a height of 150 feet. It is hoped that the tower will be completed in the coming spring.

The Wembley Tower is, however, to have a competitor in a gigantic wheel and towers, after the Chicago model, at Earl's Court. Messrs. Maudslay, Son & Field, of the Westminster Bridge Road, are the engineers. The wheel will be 300 feet high, and have attached to its circumference forty passenger carriages, each to hold forty persons. The four steel column supports will have eight platforms, fitted with restaurants, dining halls and ball-rooms. The Chicago wheel, made in twenty weeks, cost over 140,000*l*.

THE Harrogate Town Council have decided to spend 63,000*l*. in the erection of a grand bathing establishment, winter-gardens, pump-rooms, &c. In addition, 8,000*l*. is to be spent upon the repurchase and the laying-out of the Crescent Estate and improvements at the Victoria Baths; 3,000*l*. for house, greenhouse and improvements to the Bog Valley Gardens; 2,500*l*. for farmhouse and works on the Corporation farm; 2,500*l*. for street improvements, 3,000*l*. for purchase and provision of a town's yard; 250*l*. for a public lavatory, 1,000*l*. for sanatorium, 700*l*. for steam fire-engine and fire-escape, and 700*l*. for alterations at the market. Altogether, a total of 110,000*l*. will have to be provided in the next four or five years.

THE Manchester Corporation are seeking powers to borrow 250,000*l*. for the purpose of extending the gasworks of the city, and a Local Government Board inquiry has been held with respect to the matter. The Lord Mayor mentioned that the Corporation had spent 2,000,000*l*. on Thirlmere Waterworks and 750,000*l*. on sewerage works, and over and above this had lent 5,000,000*l*. to the Ship Canal Company.

In connection with the Aberdeen University extension the City Chamberlain (Mr. P. M. Cran) has received a cheque for

12,000*l*. as the instalment for 1893 of the Government grant of 40,000*l*. towards the cost of the university extension. It is intimated that the contribution for this year will be 10,000*l*. Dr. Mitchell, Newcastle, has sent a further instalment of 2,000*l*., making 7,000*l*. paid of his subscription.

AT the meeting of the Edinburgh Merchants' Association the proposal that a ship canal should be constructed between the Forth and the Clyde was revived.

THERE is a movement on foot at Bangor for the construction of a pier, and a meeting of ratepayers has been held in the Penryn Hall to discuss the desirability of promoting a Parliamentary bill for the purpose.

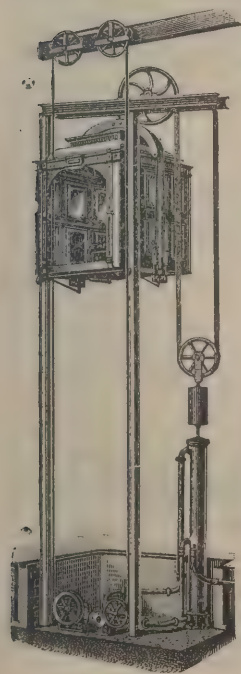
AN inquiry by the Local Government Board has been opened at Hanwell with reference to an application by the urban authorities of Acton, Chiswick and Hanwell for the provision of an isolation hospital. As it is proposed that the site should be in Perivale, one of the most picturesque hamlets in the vale of Middlesex, the scheme is opposed.

AT the meeting of the Leamington School Board a letter was read from Mr. T. G. Cundall, architect, requesting that the preparation of the building plans for the proposed new schools might be thrown open for competition amongst local architects, and not confined to one, as heretofore. The clerk explained that the proposed schools would be the completion of a block of which the plans had already been drawn. The chairman suggested that in future the Board might give other architects an opportunity of competing for the preparation of these plans.

AT a meeting of the Glasgow University Court it was announced that the Bellahouston trustees had resolved to grant 10,000*l*. for the erection and equipment of a laboratory for the chair of engineering on condition that a like sum is obtained from other sources, or if a larger sum be raised the trustees would contribute a similar proportion, the total contribution not, however, to exceed 12,500*l*. The trustees would also give 5,000*l*. for the erection of a classroom and laboratory for the chair of botany.

THE Vestry of St. George, Hanover Square, have just opened to the public the new sanitary building which they have erected in Hyde Park, on the edge of the park close to the Marble Arch. It is of handsome design, and the various fittings appear to be as perfect as they can be made. With tiled walls and floor, stained-glass windows, and both gas and electric light, the interior is decidedly cheerful. Hot and cold

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BELLS AT: Craig-y-Nos Castle (Mad. Patti), Eddystone Lighthouse, Birmingham Municipal Buildings, Hove Town Hall, Burnley, Holy Trinity Church, Crawley Parish Church, Corbridge-on Tyne Parish Church, Windermere Church, S.A., Eiffel Tower, Paris.
GOLD MEDALS—Huddersfield, 1885, London, 1885.
SILVER MEDAL—PARIS, 1889.

water will be found in the lavatories. The work has been carried out by Messrs. Bywater from the plans of Mr. George Livingstone, C.E., surveyor to the vestry.

THE Walsall Board of Guardians have adopted a report of their Building Committee, recommending the erection of an infirmary at the rear of the workhouse to accommodate 120 patients—60 males and 60 females—in four wards, the buildings to be of a plain and unpretentious character, but of the best materials, and plans and specifications to be obtained by open competition.

At the meeting of the Prescot Board of Guardians, the Building Committee pointed out that further accommodation at the workhouse was absolutely and urgently needed, and suggested that the necessary steps should be taken for the accommodation of about 250 additional cases by building upon the land adjoining the workhouse, and that plans be drawn so as to provide for any further extension as may be necessary in future. The architect had submitted plans showing schemes for both hospital and ordinary workhouse accommodation to the committee.

THE report that Boxhill is in danger of falling into the hands of the speculative builder is, it is stated, arousing the keen attention of the Mid-Surrey residents, and particularly of the members of the Dorking Town Improvement Association, recently formed to make more widely known the beauties of this practically suburban town.

BUILDING AND BUILDERS.

THE Royal Liverpool Golf Club have decided to erect new club buildings on the Hoylake links at a cost of about 8,000l.

CONTRACTS have been entered into for the erection of a large new distillery adjoining the Muirtown Wharf, Inverness. The new distillery, which is to be known as the Glen Mor, will be fitted up with the most improved appliances.

AN offer has been made by the London and North-Western Railway Company to give a site for the erection of a Cottage Hospital, near the Queen's Park, Crewe, which the company previously gave to the town in the Jubilee year. Mr. F. W. Webb (chief mechanical engineer at Crewe) has intimated his willingness to give 1,000l. towards the erection of the buildings, and two further sums of 1,000l. each are promised.

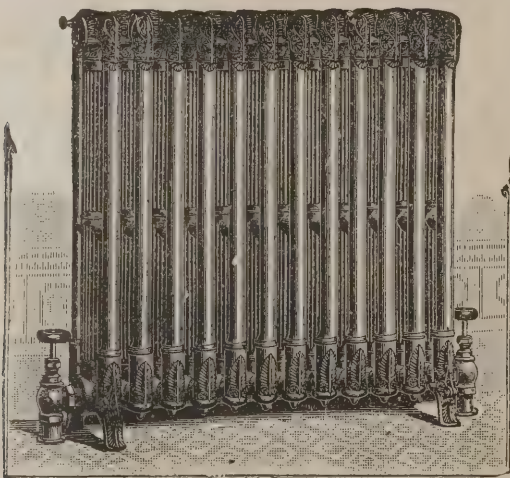
SHEFFIELD SOCIETY OF ARCHITECTS.

THE ordinary monthly meeting of the Society was held at the School of Art on Tuesday evening, the 16th inst. Mr. E. M. Gibbs presided, and there was a good attendance. A paper was read by Mr. H. W. Lockwood on "Symbolic Architecture," which was of a light and amusing character, and in which no attempt was made to trace symbolic forms to their origin, this more serious treatment being reserved for a future occasion. The writer, taking some of the most recent and best-known architectural works in the city, attempted to deduce from their design evidence of symbolic intentions on the part of their designers. The line of argument pursued was ingenious and interesting, especially to those present whose works were used for illustration. In conclusion, it was urged that, to be thoroughly successful, a building should by its design tell the beholder for what purpose it was designed. From the discussion which followed, it transpired that the symbolism discovered in the buildings had had no existence in the minds of the designers. On the motion of Mr. J. Smith and Mr. T. Winder, a vote of thanks was accorded to the writer of the paper.

The President announced that lectures had been promised by Professor Ripper, of the Technical School, on "Tests of Materials," and by Mr. Johnson, of the Electric Lighting Company, and by Mr. J. Smith.

SEWAGE DISPOSAL.

A MEETING was held in the Town Hall, Ripon, to hear the first of a course of four lectures on sanitary science by Mr. William Spinks, Assoc. M.Inst.C.E., Lecturer on Sanitary Engineering at the Yorkshire College, the lectures being given free to the public in connection with arrangements made by the Corporation with the County Council and the Yorkshire College. The Mayor (Ald. Smith) presided, and said the subject of the lecture, "Sewerage and Sewage Disposal," was of great interest to Ripon, seeing that the Corporation contemplated the adoption of some scheme for the disposal of the city sewage. Sanitary science was making great progress, and the Local Government Board were far more stringent now than in any previous period. Mr. Spinks, in the course of an interesting and instructive address, said the subject was one of paramount importance, seeing that the Rivers Pollution Act had



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put in an appearance, not only in the district, but throughout the land. No doubt it might appear hard for the people of Ripon to have to provide works for the prevention of the pollution of the river, seeing what an enormous volume of water was daily passing down it; but they were not singular in that respect, for towns of similar geographical situation in other parts of England were being dealt with precisely in the same way. The self-purifying action of rivers had been demonstrated by scientific investigation in Germany and America, but the Local Government Board took no notice of the self-purifying action of a river. Mr. Spinks examined in detail the various systems of dealing with sewage, and said the question was one in which the knowledge of the chemist must be combined with the practical work of the engineer, as different kinds of sewage required different treatment. The Local Government Board required that an acre of land for every 2,000 of population should be set apart for even the most economical sewage works, and a threepenny rate was the average of the working expenses. Most towns had to pay a rate of a shilling or fifteenpence for no particular benefit to themselves, but for the benefit of their neighbours. A vote of thanks was given to Mr. Spinks, on the motion of the Mayor, seconded by Mr. Husband, chairman of the Sanitary Committee.

PEN AND PENCIL CLUB, EDINBURGH.

At the December meeting of the Pen and Pencil Club the committee reported that an anonymous donor had entrusted them with a sum of 100*l.*, to be expended in affixing memorial tablets to the houses in Edinburgh in which eminent literary men and artists had been born or had resided. The chief conditions attached to the gift were that the men first honoured in that way should be Scott, Burns, Adam Smith, David Hume and Raeburn, and that for the future no man should be so commemorated until he had been dead for at least twenty years. The club, on the advice of the committee, resolved unanimously and cordially to accept the gift and to thank the donor, and remitted to Dr. Scott Dalglish and Mr. John Harrison, as a sub-committee to report on the best means of carrying out the object of the trust. The report of this sub-committee was submitted to the general meeting of the club, and was unanimously approved. It may be interesting to note what has already been done in the way of indicating memorable houses

in Edinburgh. About six years ago a handsome mural monument was put up by the Corporation at the corner of Chambers Street and Guthrie Street, to mark the site of the house in which Sir Walter Scott was born. De Quincey's lodging in 42 Lothian Street is indicated by a tablet affixed to the house some years ago by Mr. J. R. Findlay. A tablet affixed to the first storey of 58 High Street, at the head of South Gray's Close, marks the birthplace of Henry Erskine, and of his brother Thomas, the Lord Chancellor. The reputed house of John Knox is a little lower down on the opposite side of the street. At the corner of St. Mary Street and Boyd's Entry, a tablet indicates the site of Boyd's Whitehorse Inn, where Johnson and Boswell lodged during their visit to Edinburgh. There is a weather-worn and scarcely decipherable board over the first-floor windows of Allan Ramsay's house in the High Street, on the north side, a few doors below North Bridge Street, and this the secretary of the club (Mr. W. W. Macfarlane) has generously offered to renew. A similar board has been affixed to the birthplace of David Roberts at Stockbridge, by Bailie Dunlop, to whom the property now belongs. The lodging of Charles Darwin, when a student at the University, is indicated by a round plaque over the doorway of No 11 Lothian Street, put up by Mr. Ralph Richardson.

BUILDER'S CLAIM.

THE case of Nightingale v. Sir C. Nicholson and others (the London, Liverpool and Globe Insurance Company) was resumed before Mr. P. E. Pilditch, sole arbitrator, at the Surveyors' Institution, on the 16th and 17th inst. The claim is one by a builder for a considerable sum for reinstating a large block of warehouses at Rotherhithe, against the insurance company who undertook the reinstatement. For the plaintiff (the builder) appeared Mr. F. R. G. Radcliffe, instructed by Messrs. Mackrell, Maton & Godlee; and for the insurance company, Mr. Dickens, Q.C., with whom was Mr. Cecil Chapman, instructed by Messrs. Lee & Pembertons. In addition to the professional gentlemen who previously gave evidence on behalf of the plaintiff, Mr. Nightingale (the plaintiff) and Mr. James Frazer gave evidence on the builder's behalf, and were under examination and cross-examination during the whole of the sitting. The further hearing of the case was adjourned until January 24 and 25 instant.

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LONDON BUILDINGS BILL.

THE following suggestions to the above Bill are offered by Mr. Frederick Meeson, architect, district surveyor for East Hackney North:—

Sects. 40, 45, 64 and 185 (sub-sect. 20). These sections read together, as they must be, present difficulties. Two buildings may have for a small area a wall in common, that being undoubtedly a party wall, whilst the walls extended in the same plane as that party wall are actually external walls, but are to be deemed party walls, for any distance laterally and in height to 10 feet above the roof of the lower building. Then either an opening could not be made in these external walls—which lawyers would probably regard as absurd—or an opening could be made immediately above the roof of the lower building, which it is apparently the aim of sect. 45 to prevent.

Sect. 47. This section has the defect of allowing a horizontal chise 14 inches wide and 4½ inches deep for nearly the whole length of a party wall 13 inches thick.

Sect. 50, sub-sect. 4. It might be better to substitute a definite height for the closing words of this sub-section.

Sect. 55, sub-sect. 1 (b). The height of 8 feet 6 inches appears excessive, and is a great increase from 7 feet, which is required by the present law.

Sect. 58. This section needs modification to meet cases in which the building and passage, though in one occupation, or without occupation at the time of their construction, are afterwards let separately. Ties should be specified to the arches.

Sect. 60. The projection of 3 feet might be increased a little.

Sect. 68. Seems to require a statement that an enclosed railway arch shall be deemed to be a building.

Sect. 127. It might be better to describe the notice mentioned in sub-section (b) as "building notice."

In any case in which a building notice shall have been given, the district surveyor would not have his present power of requiring work to be laid open, should a wrongful act or omission be suspected but not be known.

It also appears that, as hitherto, a notice of irregularity cannot be served after the completion of the works, but it is most desirable that the district surveyor should have power to serve a notice of irregularity within one month after completion, or after discovery, of an irregular building or work, and it may be that a magistrate would hesitate to inflict a penalty under sec. 179, in any case in which another mode of proceeding would seem to be prescribed by the Act.

Sect. 131. The desirability of remunerating district surveyors by salary instead of fees is recognised in this Bill as in the present Act, but the step should have been taken, for who can doubt the impropriety of their receiving their daily bread at the hands of those whose work they have to overlook, and how can they without some loss of dignity do the business of a tax-gatherer? This question should be looked at only from the point of view of what is best for the public service.

Sect. 169. Under this section the district surveyor could only make one survey of a completed irregular building.

Sect. 180, sub-sect. 18. One small detached greenhouse to each dwelling might be exempted.

THE SHOOTER'S HILL HOSPITAL.

At the meeting of the Board of Guardians of the City of London Union on Tuesday, the *City Press* says that Mr. Lile asked if it was correct that the Asylums Board was about to build at Shooter's Hill a hospital costing 220,000*l.*, for 500 patients, which meant 450*l.* per bed? Mr. Lobb also asked whether this enormous expenditure arose mainly from the conditions imposed by the Local Government Board with regard to space? Mr. Lindsey said that owing to illness he was unable to attend the last meeting of the Asylums Board, but he believed the statement of Mr. Lile was perfectly correct. He had been present on the previous day at a meeting of the General Purposes Committee of the Asylums Board, when the committee considered the matter which had been referred back to them. He thought that as a result the expenditure would be reduced to 193,000*l.*, a reduction of about 27,000*l.* With regard to Mr. Lobb's question, there was no doubt that the Board had been considerably restricted by the Local Government Board. The Local Government Board did interfere, and when it did give its consent, after some tardiness and considerable delay which had resulted in great suffering and inconvenience to the poor, it insisted upon many

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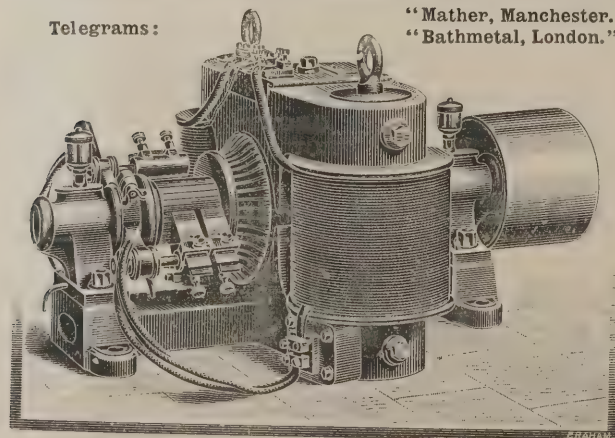
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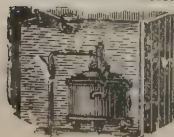
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restrictions. These referred, for instance, to the number of cubic feet to each patient, the wards being a certain distance from the roadway, and in this case from the Herbert Hospital, and no doubt these restrictions interfered very much with the economy that might be exercised. He thought this 193,000*l.* might be further reduced, as he had pointed out to the General Purposes Committee, by another 5,500*l.* This was the cost of the installation of electric lighting. He utterly failed to see—he was only one by himself on the committee—how electric lighting could benefit fever patients, seeing that there must necessarily be an installation of gas as well. It might save trouble to the attendants, perhaps, but that was all. He was afraid that if the electric light was granted in this case all the other hospitals would ask for it, and the consequent expense would be very great. Mr. Willmott said he had gone very carefully through the plans for the new building with the architect, and he might say that not a sixpence was to be spent in ornamentation. A plainer, more Quakerish looking building could not be conceived. The architect had shown him that it was impossible with the necessary efficiency to avoid the expense, which was not extravagant when it was considered that the building would be for over 500 patients. There was every desire to keep expenses down. The work would be put up to contract in such a way that a fair portion should go among the medium-sized builders. It was the large contractors who made the big profits. The thing was in very good hands, and when the work was done the ratepayers would be satisfied. Mr. Loxley asked whether it was a fact that 300 nurses would be appointed? Mr. Lindsey replied that the number had been reduced by one-half, namely, to 150.

THE Corporation of Bolton is engaged in an important series of public improvements, including alterations to the Market Hall (by the conversion of the exterior into shops), involving a cost of 8,000*l.*; the establishment of a new scavenging depot at Back o' th' Bank, for which 30,000*l.* has been borrowed; and the laying down of an electric installation, which, when complete, will have cost about 40,000*l.*; and the redecoration of the Town Hall, at an expenditure of some hundreds of pounds. The postal authorities are also engaged in extensive structural improvements at the central post-office, at a cost of 3,000*l.*

NORWICH MAIN DRAINAGE.

A VERY important contract has just been placed in the hands of Mr. F. H. Brook, of 171 Queen Victoria Street.

The Corporation of the City of Norwich have been for some time anxious to replace the existing old and unsuitable sewers by an entirely new system of main drainage, which will be in accordance with the latest and most scientific views of the day and which will also provide for the future requirements of the city. For this purpose there will be required about 52,000 feet, or say ten miles, run of stoneware pipes, bends and junctions, ranging in size from 6 inches to 21 inches diameter, and which Mr. Brook has been selected to supply. As the Norwich Corporation intend that their new system of drainage shall be a perfect one, it was indispensable that all the pipes and materials chosen should be of the most enduring quality and the most perfect construction. By entrusting so important an undertaking to Mr. F. H. Brook the Corporation are only expressing the confidence which is generally felt in his capacity and the excellence of his ceramic productions.

THE INSTITUTION OF ELECTRICAL ENGINEERS.

At the ordinary general meeting of the Institution of Electrical Engineers, on the 12th inst., Mr. Alexander Siemens, the president for this year, delivered his inaugural address. After reviewing the history of the legislation during recent years in connection with electrical development, he said that during the past twenty-two years their profession had changed its character and become much more intimately connected with the everyday life of the general public. The result of the legislation had been to create a number of difficulties in the establishment of distributing systems in the United Kingdom, but the financial success which had invariably attended the municipal electrical enterprises had relieved the rates at the expense of the wealthier classes in a perfectly legitimate manner, and the more electricity became one of the common necessities of life the better it was that its supply should be in the hands of the community, and not in those of monopolists. The principal hindrance to the development of electrical engineering must be looked for in the exaggerated expectations that were raised, either by ignorance or by design, when the

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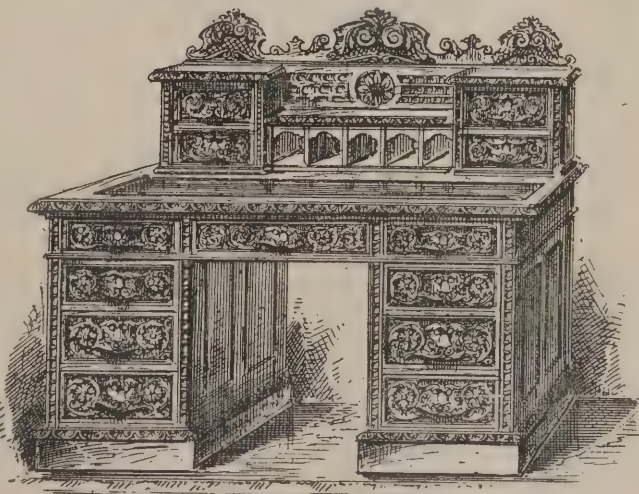
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general public first seriously thought of regarding electricity as a commodity for everyday use. In its first stage the development of the electrical industry was closely connected with telegraphy; the second step might be said to have been taken when electric lighting was introduced; and now it seemed that transmission of power was to be the problem which electrical engineers had to grapple with in the near future. The success of electric tram-lines had undoubtedly contributed to direct general attention to the transmission of power by electricity, but great care would have to be exercised so as not to start in a direction that could lead to no practical results. Many schemes had been started to introduce electricity as the motive power on the main lines of railway, and to accelerate at the same time the speed of the trains, even up to 200 miles an hour. It would be rash to say that such a speed would not be attained some day, but in his opinion none of these schemes could be carried out on a commercial basis with the means at present at disposal. The conclusion of the address was devoted to the improvement which had within recent years taken place in the education of electrical engineering students, and emphasis was laid upon the importance of workshop experience.

SANITARY APPLIANCES.

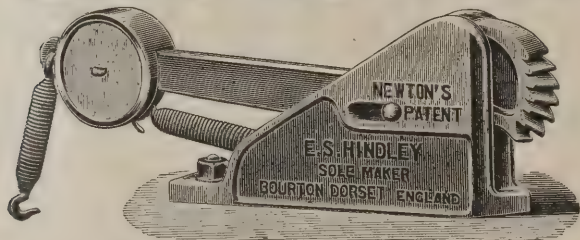
AN illustrated supplementary catalogue for 1894, dealing particularly with improved specialties in water-closets, has just been issued by Mr. George Jennings, of Lambeth. One of the principal features in the catalogue is Jennings's improved "closet of the century," with syphonic discharge, a combination water-closet, urinal and slop-sink. This appliance is intended to combine the simplicity of the ordinary "flush-down" cottage basin and trap with the advantages of a valve closet, having a full basin of water 6 inches in depth, a seal of 3 inches, a surface area of 12 by 10 inches, and being entirely free from mechanism of any kind. It may be had in white or decorated earthenware, strong fireclay or enamelled iron, at prices to suit any class or style of building, high-class buildings included. The basin is secured against the possibility of being syphoned by discharge of slops, while the complete removal of contents after use is insured. It has a special form of patented outlet joint, securing an air-tight connection to the lead trap below or above floor level. There is a special flush and an after-flush. The cistern, of simple construction, is quick-

filling and noiseless. The service pipe from the cistern has two connections to the closet, one leading into the basin in the usual manner, and the other to the syphon pipe. The flush is by this means divided into two streams. The one flushes the basin, the other stream expels the air through a puff-pipe, starts the syphonic action, and empties the basin, which is refilled with clean water by a simple after-flush arrangement in the cistern. The working of the closet may be readily seen on examination of the illustrations given in the catalogue. The drawings are in section to a scale of one-eighth full size, much enhancing their usefulness. Five full-sized plates also show the "closet of the century" as adapted for different positions, various circumstances, requirements, buildings where strength is an important desideratum, &c. In price it ranges from about 5/-. By going to a little extra expense any amount of enrichment may be obtained. Jennings's "deep seal" wash-down closet is specially adapted for buildings where strength is required. It is a combination water-closet, urinal and slop-sink. The basin and trap are of one piece of glazed fire-clay, or it can be supplied in white or decorated Queen's ware of best quality. The water-surface area is 7 inches long and 5 inches wide, with a depth of 5½ inches. There is a seal of 2½ inches, yet the flush is so directed and concentrated that the contents of the basin are effectually driven through the trap into the drain and the interior of the closet thoroughly cleansed. These closets come still cheaper than the "century closet." Jennings's "1891" patent pedestal valve-closet and trap is illustrated as fitted up fully with water-waste preventer cistern. If desired, Jennings's anti-percussive regulating supply-valve may be substituted for the cistern. Jennings's "improved era" is a valve water-closet of the Bramah type with anti-percussive regulating service valve, flushing rim basin, large weir overflow, union for vent-pipe at highest point, and the iron-work is galvanised.

PROTECTION FROM FIRE.

THE British Metal Expansion Company, Limited, of 2 Lambeth Hill, E.C., have arranged in their show-rooms a series of models with a view to the practical display of the merits of their expanded metal lathing in connection with fireproof construction. This system of fireproofing is protective to speak accurately. Constructive fireproof work depending on walls, partitions, floors, staircases, &c. is formed of fire-resisting

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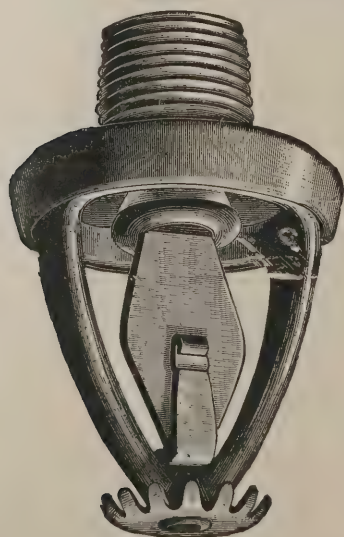


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SPRINKLER, Closed.

THE GRINNELL AUTOMATIC SPRINKLER And the Great Fire in Old Bailey.

LETTER FROM "THE TIMES."

"CASSELL & COMPANY (Limited) write to us, under date November 16, as follows:—'Will you kindly allow us to state that the fire which took place in Fleet Lane last night, and by which a portion of our premises was damaged, will not in any way interfere with the punctual issue of our magazines, periodicals and books? All our monthly magazines for December will be issued at the usual date, and our weekly periodicals, *Cassell's Saturday Journal*, *Chums*, and *Cottage Gardening*, at the ordinary time next week. This week's issue of *Work* and of the *Speaker* may be an hour or two late; but full editions have been prepared, and will be obtainable in the ordinary course. We should like to add, for the information of your readers in general, and of those interested in insurance matters in particular, that the system known as GRINNELL'S AUTOMATIC SPRINKLERS, which we adopted some years ago as a protection against fire, acted admirably on this the first occasion on which it has been practically tested, and undoubtedly did much to save our buildings from serious damage by fire.'

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materials, such as stone, brick, concrete and ironwork, whereas this system is designed as a fireproof protection for combustible materials, and is called the "Expanded Metal" lathing, the above-named company being the sole proprietors and manufacturers in the United Kingdom. One great aim has been the employment of the best material to secure the best quality of metal lathing. Mr. T. Lewis Banks, F.R.I.B.A., has issued a pamphlet descriptive of the system, in which he explains that "expanded metal lathing was discovered, rather than invented, by Mr. Golding, of Chicago. His first thought was to produce a cheap and strong open fencing by expanding incisions in thin steel, and not until he had done so did he see what an admirable substitute it would be for the ordinary wood lath, if the meshes were made smaller."

The models on view show floors, walls, partitions, ceilings, &c., both in course of construction and finished, and supply an easily understood object lesson of the value of the material for such and similar uses.

Expanded metal lathing being made from sheets of fine steel combines at once the maximum of lightness and of strength; it is obviously non-inflammable, and the interstices, being at an angle of 45 degs. with the sheet, form an admirable key for the plaster or cement applied thereto.

The model of an "open" fireproof floor, for which Mr. Banks has secured provisional protection, aptly illustrates these qualities. It is constructed of light girders, on the flanges of which rest light iron or steel centres, and on these the expanded metal for the support of concrete is laid. The centres carry the weight of the concrete until it has set, when they are only required to support the ceiling.

The tie-bars of the centres are kept horizontal by means of metal strips, which can be moved towards the centre should the weight of the concrete in course of drying cause a slight deflection. The expanded metal for the ceiling is suspended to the tie-bars by patent hooks and rods, so that no wiring is required. It can be seen that there is a space between the ceiling and the concrete floor above, which can be utilised for purposes of ventilation or for gas and water pipes, bell wires, &c. In the model of a "solid" floor, also provisionally protected, the expanded metal lathing is suspended below the iron girders by specially-designed clips and rods. On the upper side of the lathing is placed a layer of hair plaster, which is allowed to dry and harden before the space between the girders is filled in with concrete. By this method the plaster, having served its purpose as a bed for the concrete, forms a perfect

key for the ceiling beneath. A model of a solid plaster partition, 2 inches thick, shows what may be done where economy of space is a desideratum, and has the merit of being extremely light and at the same time perfectly rigid. As a protection of wood from fire, the lathing can be fixed at any desired distance from it, and as in other instances the method of fixing is very simple and no wiring is needed. Metal loops, or elongated eyes, are screwed into the joists of the ceiling or driven into the studs of the partitions, rods are threaded through the eyes on each side of the metal lathing, thus fixing it in position, and the same principle can be applied to casing wood beams and posts. The new and revised price list of the company shows a reduction in prices.

MUNICIPAL GAS SUPPLY.

OUT of the 302 municipal corporations in England and Wales only 75 have undertaken to supply gas in their boroughs. From the Board of Trade returns which have been issued this year, showing the operations of local authorities' gas undertakings up to March 25, 1893, it appears that in the United Kingdom there are 185 local authorities having their own gas-works, being an increase of three since last year. These 185 undertakings are made up as follows:—75 belonging to English and Welsh municipalities, 70 carried on by English and Welsh Local Boards or Improvement Commissioners in non-incorporated districts, 34 in Scottish burghs, and 6 in Irish towns. These 185 undertakings have borrowed 22,734,556*l.*, of which 4,767,254*l.* has been repaid, leaving their present indebtedness 17,967,302*l.*, upon which there was paid during the last year in the way of interest and instalments 994,517*l.* The net profits of the aggregate undertakings amounted to 305,040*l.*, the greater part of which was used in relief of rates, and part as rebate to the gas consumers. In the case of Leeds, the gas was supplied at 2*s.* 2*d.* per thousand feet, less discount 2½ to 5 per cent., the illuminating power being 17 candles. The total receipts in respect of the gas undertaking for the year was 305,963*l.* The expenditure on account of the works was 250,128*l.*, and the payments on capital account were—interest on loan, 42,576*l.*; to sinking fund, 10,118*l.*; total on account of capital, 52,694*l.* Profit, 3,141*l.*; tons of coal used, 251,500; cubic feet of gas made, 2,503,544,500; miles length of gas mains, 710; number of consumers, 76,200; number of public lamps, 9,471.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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ORDINARY BURNERS, 50 calories per candle per hour.

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STORAGE OF RAIN-WATER.

THE year 1893 will long be remembered for the severity of its drought. The importance of storing and preserving rain-water came home that year to many householders as a matter of urgent necessity.

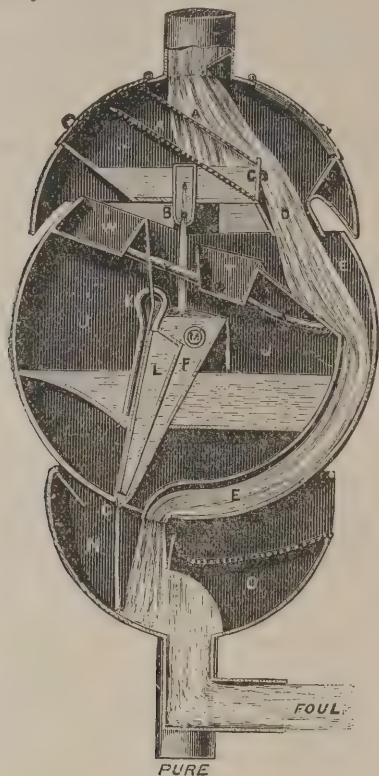


Fig. 1.—Section of Vertical Separator.
Impure Water Passing to Waste.

Rain-water Separator. Mr C. G. Roberts, of Haslemere, Surrey, has worked at this invention for many years. In 1886, and again two years later, we described and illustrated the improve-

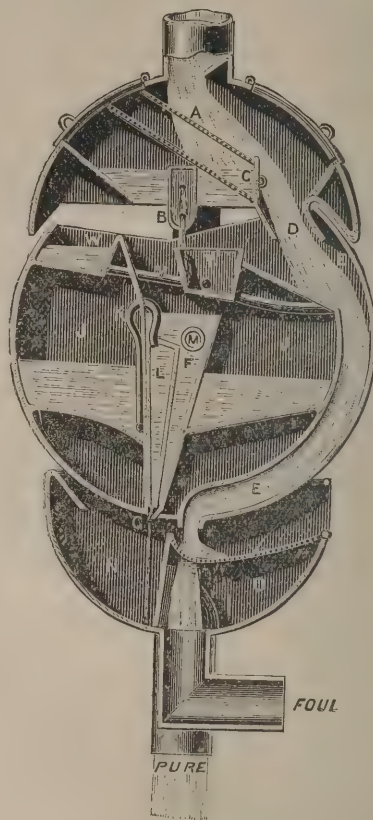


Fig. 2.—Section of Vertical Separator.
Pure Water Passing to Storage.

Now that rain-water can be stored in a pure state it is much more generally useful than it was before the introduction of the

ments that had then been introduced in the design of this ingenious automatic apparatus. No illustration has been given

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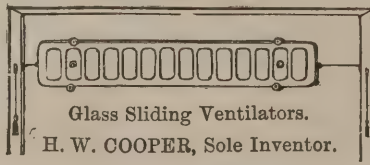
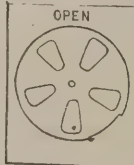
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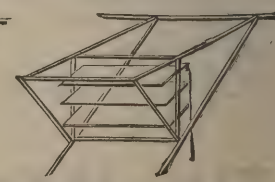
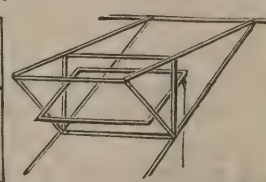
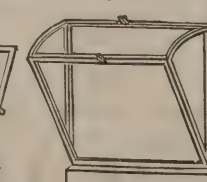
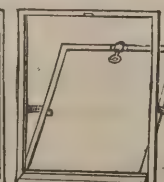
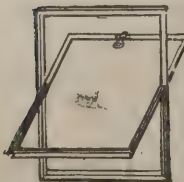
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in our pages since 1888, and as many are interested in the subject of storing pure rain-water, we now show in figs. 1 and 2 sections of the Vertical Separator, which is used where a single stack-pipe carries the water from the roof, and in fig. 3 the exterior of the horizontal form, for attachment to an underground pipe that serves to collect and convey into the tank rain-water from any number of stack pipes that may be attached to one or several independent buildings.

Fig. 1 shows the vertical separator in the position that it retains when running foul water into the waste pipe during the first part of a shower, while the roof is yet dirty. Fig. 2 represents it when it has canted and has begun to run pure water into the storage tank after the roof has become clean. The change of position is effected by the gradual accumulation of a small portion of the water in the chamber J of the canter; when the water reaches a certain height it makes the left side heavier than the right, and the canter turns a little on the pivot M that supports it, so that the water is delivered 2 inches further to the right than it was before; and, whereas it at first ran through N into the waste-pipe, it now runs through O into the storage-tank.

In figs. 2 and 3, AA are strainers removable for washing. B is a removable slide with two small holes to regulate the flow of sufficient water to work the canter. C is a sluice to be adjusted to the area of the roof. D is the outlet for surplus water. In moderately heavy rain the main volume of the water flows through this spout D into the delivery-pipe E, running round the right hand of the canter; a small proportion only passes through the strainer and out of the small holes B into the funnel F, that terminates in the small hole G.

In a very slight rain the whole of the water passes through the strainers and the hole at B into F, and when it is not enough to effectually wash the roof it all escapes through G without making the canter move. When there is more rain than can pass through the hole G, it rises in F and L, and a small quantity runs over the side of the funnel, slowly filling the chamber J. When J is filled to a certain height, it overbalances the canter and makes the water run to a storage through O, as shown in fig. 2. This change in position causes the water from B to run into T, and cease to run into F. As the water sinks in F it also sinks in L, causing the siphon K to act and empty the chamber J. Meanwhile the little chamber w is partially filled by water running through T, V, W, and Z, and its weight prevents the separator from recanting until the water ceases to run from the roof.

As soon as W is empty, the canter rights itself, ready for the next rainfall, the right-hand side of the canter being heavier than the left when it is empty. By means of the joint action of the sluice C and the holes at B and G, the flow of water in the working part of the separator is so regulated that the chamber J is filled to the canting point as soon as a certain quantity of rain (a gallon, more or less, on each 100 square feet of roof) has fallen, either quickly or slowly.

Three slides, marked 1, 1½, and 2, are sent with each separator. The one marked 1, intended for use in the country, allows about one gallon; and the one marked 2, for city use, allows about two gallons for washing each 100 square feet of roof.

The horizontal separator (fig. 3) is, like the vertical, self-acting, needing no attention except an occasional washing at long intervals. For large buildings or groups of buildings it is far preferable to the vertical form, for instead of needing a

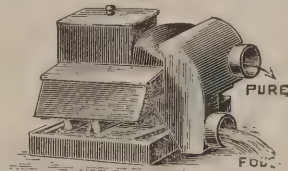


Fig. 3.—Horizontal Separator in Normal Position.

separate machine for each stack pipe a single one will serve for all the water that flows into the tank or reservoir. The cost, 3½ and upwards, is small compared to that of building the tank, which by this addition becomes a reservoir of pure soft water, instead of receiving, as it usually does, all the soot, bird droppings and other impurities from the roof.

At the meeting of the Edinburgh Water Trust, Mr. Coyne, engineer, in his monthly report stated that the number of pipes laid during December was 377, of which 316 were in extension of the system. The number of apparatus examined for the checking of waste of water was 28,803, of which 1,515 were faulty or in a state of disrepair. There were upwards of 300 burst pipes in the city owing to the recent severe frost, and that the officials of the Trust have during the last two days issued 800 notices with regard to burst pipes or defective apparatus.



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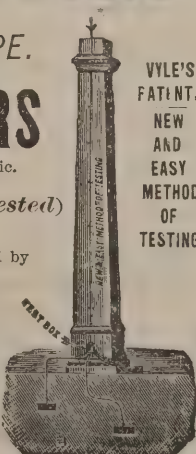
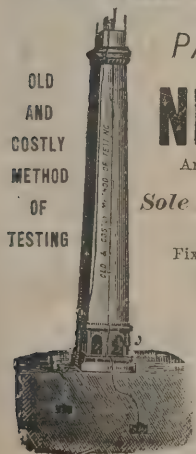
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PURIFICATION OF RIVERS.

A PAPER on "The Evolution of Opinion on the Self-purification of Rivers" was read by Mr. William Naylor, F.C.S., M.I.C.E., chief inspector of the River Ribble Joint Committee, before the members of the Association of Medical Officers, at their last monthly meeting. In the course of his paper Mr. Naylor gave an account of this evolution of opinion, dating from the proceedings of the Rivers Pollution Commissioners during the years 1868 to 1872. The Commissioners' report said:—"We are led to the inevitable conclusion that the oxidation of the organic matter in sewage proceeds with extreme slowness, even when the sewage is mixed with a large volume of unpolluted water, and that it is impossible to say how far such water must flow before the sewage-matter becomes thoroughly oxidised. It will be safe to infer, however, from the above results, that there is no river in the United Kingdom long enough to effect the destruction of sewage by oxidation." Reference was made to the subsidence of a large proportion of the grosser mechanically suspended particles which undoubtedly does take place in the quiet reaches of the Mersey and Irwell. To this partial subsidence and consequent clarification may undoubtedly be attributed the very general but erroneous belief in the rapid self-purifying power of running water. "It must be remembered, however, that the mud so thrown down is only deposited, not removed or rendered innocuous." Mr. Naylor mentioned the opinions of Dr. Tidy and Dr. E. Frankland. The latter said that "if peaty matter dissolved in river water is spontaneously oxidised at all, the process takes place with extreme slowness and cannot be accomplished to any considerable extent in the flow of a river, for our results show that peaty matter is even less oxidisable than animal matter under the same conditions." In conclusion, Mr. Naylor, after quoting other opinions, gave in effect the following:—1. Rivers deposit sediment on the banks and bed, and are thereby purified. 2. That the soluble matter in rivers is affected according to the chemical composition of the beds and banks. 3. That very little oxidation of organic matter takes place due to the direct effect of atmospheric oxygen. 4. That very considerable and appreciable alterations in the amount of organic matter are brought about by organisms in the river waters. 5. But that the length of time which must elapse before a river can become sufficiently purified from sewage is greater than afforded by the course of English rivers.

NEW BOARD SCHOOLS, READING.

NEW Board schools recently erected for the Reading Board, and to be known as "Battle" Schools, have just been opened. They have classroom accommodation for 1,136 children, with a cookery centre and caretaker's residence. The buildings are all of one storey, in three separate detached blocks. The main block is the mixed school for 768 boys and girls. The second block is for 364 infants, and the remaining block consists of the cookery school and caretaker's house combined. The arrangements of plan are on the classroom system, with central halls, the mixed school having thirteen classrooms and the infants' school six.

There is ample cloak-room and lavatory accommodation, a head-master's room and separate private rooms for the staff of teachers. The buildings are faced externally with Higgs & Sons' hand-made red bricks, with strings and other features carried out in special moulded brick, and the shaped and moulded gables form a pleasing skyline and give a distinctive architectural treatment to the external appearance of the buildings. A marked feature in the centre of the group is a lofty campanile, which serves as a ventilating shaft communicating with underground passages and culverts, through which the vitiated air is drawn from the several rooms and halls by means of a propeller worked by a gas-engine, and a constant circulation of fresh air is thus secured. The heating is by means of hot-water ventilating radiators and coils. All the windows are fitted with Leggott's gear for summer ventilation; the floors are of pitch-pine blocks, laid by the Wood-block Flooring Company; the whole of the playgrounds are paved with "Granitic" paving throughout, and the premises generally are fitted in a most complete manner, and may claim to be regarded as a pattern of a well-ordered school.

The builders are Messrs. Higgs & Sons, of Reading; Mr. R. Pratt was clerk of works, and the architect is Mr. S. Slingsby Stallwood, F.S.A., of Reading.

DRAINS IN DUBLIN.

In a letter to the *Irish Times*, Mr. Kaye Parry writes:—

I think I may fairly claim to know as much as most men about the condition of house drainage in the city of Dublin, but hitherto I have refrained from taking part in the controversy regarding the health of Dublin, as I do not think there is anything to be gained by attempting to answer all the ill-considered

AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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and irresponsible statements which are made from time to time by amateur sanitarians.

In justice to a large number of my clients I must, however, protest against one of the proposals of the Chairman of the Public Health Committee. It is suggested that all the cross-drains under the footpaths and roadways from the houses to the sewers should be made perfect, and that this should be done at the expense of the owners or occupiers.

I am fully alive to the necessity of making these branches perfect, but I think I can show that it would be a grave injustice to saddle the house-owners of Dublin with the expense.

For very many years all these branch-drains have been laid by the Corporation workmen, and no private engineer has been allowed to interfere with the method of construction or to apply any test. I have never seen any of these branch-drains subjected to any test whatever. I introduced the water test into Dublin in the year 1883, and ever since then I have made it a rule to test every house-drain in this way in cases in which I have been professionally engaged. I know therefore what this test means, and I give it as my deliberate opinion that not a single cross-drain between the front areas of the houses and the main sewers would stand this water test. If these branches are not watertight they are not perfect, and if they are not perfect they should be reconstructed. The question then remains at whose expense this should be done. Although all these connections have been made by the Corporation workmen, the house-owners have paid for the work. A sum of money sufficient to cover the expense has to be deposited in each case at the City Hall by the owner or occupier before the work is commenced.

During the last ten years, while the water test has been known and generally adopted in Dublin, the Corporation have continued to lay these branch-drains at the expense of the house owners or occupiers without testing them. If all this work has to be done again it will surely be a very great hardship to make the owners pay a second time.

I find there are 25,764 inhabited houses in Dublin. The average cost of reconstructing the cross-drains from these houses to the sewers would certainly not be less than 7½. each, and this would involve a total expenditure of 180,348½.

In my own practice within the city boundary since 1883, I have superintended the reconstruction of the drainage of some 250 houses, and in almost every one of these instances a new connection has been made with the street sewer at the expense of my clients.

As these figures, of course, only represent a small proportion of the total number of street connections laid, it is evident that the outlay necessary to remedy the defective work of even the last ten years will be very large.

RATING OF LAND VALUES.

THE following resolution was adopted at the meeting of the London County Council on Tuesday :—

"That as it is imperatively urgent that a measure should be passed next session for the taxation of ground or site values, and as this cannot be done unless the Bill be brought in as a Government measure, the Council is of opinion that all lands situate in municipal areas and whether partially or entirely covered with buildings or existing as vacant land should be made directly liable to local and other taxation, and for that purpose should be entered in a separate column in the valuation lists; and that no contract should be allowed to affect any charge falling or imposed on the land value as stated in the land value column. That, with a view to the framing and introduction of such a measure, a copy of this resolution be forwarded to the Government together with the following documents :—(a) Report of the Local Government and Taxation Committee, November 29, 1893; (b) Land Values (Taxation by Local Authorities) Bill, introduced into Parliament February 1, 1893; (c) memorandum by the vice-chairman of the Council on the subject of that Bill; (d) reports by the valuer of the Council upon the above report and Bill and the various documents therein referred to; and that the chairman and vice-chairman of the Council, the chairman and vice-chairman of the Local Government Committee, Mr. Stuart and Mr. Mc'Kinnon Wood be appointed a committee to communicate with the Government on the subject and report further to the Council."

The proposals of the Local Government and Taxation Committee of the Council are as follows :—

1. That it is necessary without further delay to provide for a taxation of site values to extend to and be leviable upon all interests which share in the site value, and that for that purpose it is desirable to provide in the valuation lists a column for site values, including vacant land, in addition to the columns already provided for.

2. That the term "site value" be defined as follows :—
"The annual rent which at the time of valuation might reasonably be obtained for the land comprised in any hereditament

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as a cleared site if let for building by an owner in fee; or, if the land be not built on or let for building, a proportion equal to 4 per cent. of the price which at the time of valuation might reasonably be obtained for the land by such owner."

3. That in cases where the occupation of land for profit has been rendered possible by drainage, embankment, or other works of an analogous nature, the Council shall be empowered to provide for an allowance to be made to the owner of the site value so described, in respect of any expenditure on such works within twenty years before the valuation, provided always that any allowance contemplated under the above resolution shall be so expressed as to be independent of past or present municipal expenditure.

4. That, without prejudice to such other uses of the site value column as Parliament may determine, a new and specific rate should be imposed upon the site value, and that the site value rate ought to be started as a specific tax of so many pence in the pound.

5. That the tax should commence at a rate (to be named in the Bill) of 1s. in the pound upon the assessments appearing in the site value column.

6. That the Council should be empowered to alter the tax from time to time by an amount not exceeding 2d. in any one year, so that the rate shall not exceed 2s. in the whole.

7. That the new rate should be collected by the local authorities for the Council, and that a proper allowance for cost of collection should be made.

8. That, for purposes of recovering arrears, the Council should be empowered at its option to make and register an order charging arrears on the site.

9. That the rules of deduction above stated be approved.

10. That the method of collection and draft forms proposed by the sub-committee and approved, by us be adopted as the basis of a scheme to be embodied in a draft Land Values Rating Bill.

11. That in any such draft Bill a clause should be included as to existing or future contracts corresponding with Clause 13 of Mr. Dalziel's Land Values Bill.

12. That in any case where the whole of the site value as defined in Resolution 2 cannot be obtained, used, or enjoyed by the persons to be charged, then the assessing authority should be entitled to take all the circumstances into consideration, both in assessing the total amount to be inserted in the site value column, and in the apportionment of the rate among the various interests.

13. That all persons alleging that the rules of deduction do not apply to their case, either because of the last resolution or otherwise, should have power of appeal to the assessment authority in the first instance against the apportionment.

14. That any person alleging that the rules of deduction do not provide for his case should have a summary right of appeal to the new Valuation Court proposed to be created, or to any corresponding tribunal.

15. That the proposed Land Values Rating Bill should be applicable to all municipal areas in England.

16. That these resolutions, together with this report and the further papers circulated to the Council, be referred to the Parliamentary Committee, with instructions to prepare a draft Bill on the lines indicated.

THE INSTITUTION OF CIVIL ENGINEERS.

At the last ordinary meeting held, Mr. Giles, president, in the chair, the subject of the "Concentration and Sizing of Crushed Minerals" was dealt with in a paper by Mr. Robert E. Commans, Assoc. M. Inst. C.E.

The author first referred to the object of concentration, which was to remove impurities with which minerals were associated and to render them marketable. He then enumerated the several stages of handpicking, crushing and dressing, through which the minerals had to pass. The first two operations were briefly dealt with. Handpicking underground was carried out in order to avoid raising more waste rock than was absolutely necessary, and to pick out the very rich lumps to prevent them from being knocked about and broken. Owing to lack of light and the limited time at the men's disposal, this form of separation was naturally of a rough character and was usually followed by more careful handpicking on the surface. Where large quantities of coal had to be examined horizontal endless belts were generally employed. These were composed of steel plates or wire netting, and had a width of 4 feet to 4 feet 6 inches. When travelling at a rate of 40 to 50 feet per minute they had a capacity of 30 to 40 tons per hour. Revolving picking-tables were mostly used for ore, the pickers sitting round the periphery. To keep down the dust from the ore which had been previously crushed to about $1\frac{1}{4}$ inches size, it was washed with a spray of water. These picking-

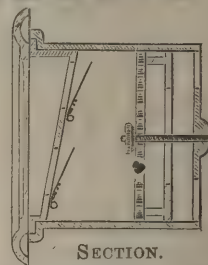
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tables had an outer diameter of 10 feet and a width of 20 inches, and revolved at a rate of from 30 to 40 feet per minute.

The machines, stone-breakers, rolls and stamps used for ore-crushing were fully described in a paper by Mr. A. H. Curtis, read before the Institution in 1892.

For reducing lump-coal prior to mechanical separation, fluted or toothed rolls were commonly employed. When crushing ore or coal the greatest care had to be taken to avoid all unnecessary pulverisation and, as far as practicable, the ore or coal ought never to be reduced beyond the point at which the pieces of mineral were freed from their rocky matrix. The first operation, after crushing, was the careful sizing of the material. This was usually performed by means of screens. The limit to which crushing and sizing should be carried must be determined in each special case. For sizing lump-coal it was the practice to employ some form of bar-screen. One of the most improved mechanical screens, known as the "Coxe" screen, and used for screening anthracite at the Cross Creek Collieries, Pennsylvania, was fully described. This screen resembled somewhat the well-known "Briart" screen, but differed therefrom in that the outer end of the bars only moved up and down half the stroke of the eccentrics, and thus lessened the tossing action and the tendency to break the lumps. Another ingenious screen, also invented by Mr. Coxe, for sizing small lumps of coal and shale before washing, working on the gyrating principle, was mentioned. This screen consisted of a strong iron box or casing, fitted with punched plate screens, the screen-box itself being carried on four double-chilled cones of special design. The motion of gyration was imparted to the screen-box by means of a vertical central crank. This motion could best be illustrated by imagining the movement of a plate resting on spheres of equal diameters, moved by hand in a circular direction, when it would be evident that every point of the plate or screen described a circle of equal diameter, but with different centres. These screens could be used for wet or dry material, and the friction being entirely a rolling one, small power was required to drive them. Cylindrical screens were mostly used for sizing coal, and nearly exclusively for ore, as this was invariably fed into the screens in a moist condition and washed during the operation of screening by a spray of water. These screens took little power to drive, ran smoothly, without shock or vibration, were simple in construction, and capable of easy examination and repair. The author indicated the sizes into which it was usual to classify coal and ore, adding that

the tendency in this country had been rather to neglect sizing altogether, and on the Continent to go to the other extreme by adopting almost unnecessary refinements. A brief consideration of the principles underlying the sorting or separation by gravity of particles in water was next given. Jigging-machines, on account of their great simplicity and large capacity, were more used than any other form of apparatus for sorting, not only the comparatively coarse crushed material, but also the fine. The various forms of hutches, sieves and pistons were discussed, and several methods for removing the concentrates and driving the pistons were described. In order to separate particles of different specific gravities below from 2 to 1 millimetre in diameter, which did not permit of being satisfactorily sized by means of screens, and to render them suitable for after-treatment, they required to undergo a preliminary sorting or hydraulic classification. This was commonly carried out in so-called pointed boxes of various forms. Two interesting designs of this class of apparatus were referred to. The one known as the "Calumet," which was largely used in the Lake Superior district for sorting the finely crushed native copper ore; the other the "Siphon" separator, used so successfully at the dressing-works of Mechnich for separating nodules of galena from a matrix of white friable sandstone. When jigging sand or meal-products which had been sorted through pointed boxes, a layer or bedding of rich mineral, or of some material of a specific gravity greater than that of the barren rock, was commonly employed. This bedding, resting on the sieves, acted as a kind of filtering medium and prevented particles of less density passing through into the hutch below. With coal a bedding of felspar was usually adopted. Two forms of fine jigs, known respectively as the "Bilharz" and "Schrantz" machines, were described, the chief feature of novelty being that the sieves themselves were plunged as by the old-fashioned hand-jigs, no pistons being employed. The Bilharz fine jigs were arranged in series, a different product being separated on each machine; whereas with the Schrantz machine, one long sieve was used divided into several fields, the depth of bedding in each division decreasing slightly towards the discharge end. By means of the circular Bilharz jig, which was somewhat similar in principle to the one above mentioned in that the sieves were plunged, a still further development of the principle of jigging had been attained, and the very finest pulp concentrated. There was, however, a point where this method of separation ceased to be advantageous, as when the particles were very fine they

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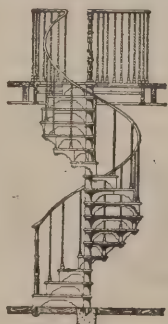
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changed together, and required to be largely diluted with clean water to free the separate grains. Various forms of buddles, or tables, had therefore to be employed. A bump table, known as the "Gilpin County" concentrator, was described, by which, instead of the rich headings or concentrates being packed on the head of the table by the bumps imparted to it, requiring afterwards to be removed by hand, they were delivered automatically as soon as the separation took place. Under the head of "Shaking-Tables," the Frue Vanner was specially referred to. With this machine, instead of a table, an endless rubber belt was employed. The slime to be treated was delivered near the upper end; a slow upward travel was given to the slightly-sloping belt, and at the same time a gentle side shake was imparted to it to keep the slimes in agitation. This promoted the settling of the rich mineral on to the surface of the belt, to which it clung with greater tenacity than the barren rock, and was accordingly carried on the belt past a spray of water, and separated from the tailings, which were washed off the lower end of the belt. This form of concentrator had been more especially adopted for the concentration of sulphurets containing gold, which could not be caught by amalgamation. A specially interesting feature about this class of machine was that it allowed of the separation of particles differing very considerably in size. The "Linkenbach" buddle was a modification of the revolving convex buddle, but differed from this in that the bed or table was a fixture and the slime and clear-water distributors revolved. The object of having the table or washing-surface fixed was that it was found that when, from the nature of the slimes, a perfect separation of these could not well be effected on a table 18 feet in diameter, it would not be desirable to increase further the diameter of the table, as it would become unwieldy and liable to run unsteadily. Where a fixed table was employed the diameter was of comparatively small importance, and such buddles had been built with diameters of over 20 feet, giving the most satisfactory results. None of the slime-washers effected as perfect a separation as could be desired, and there was still room for considerable improvement in that direction.

The experiments carried out by Professors Hoppe and Munro would seem to prove that sizing prior to jigging was rather a disadvantage than otherwise, and suggested that before throwing over the old theories of close sizing, it was desirable that further tests should be made, in which the jig action was more closely reproduced.

In conclusion, separation by pneumatic, centrifugal and magnetic agency was referred to. The two former methods, however, did not seem to have been largely used for treating minerals. On the other hand, the magnetic separation of iron-ore from earthy matter would appear of late years to have received much attention in America, where large deposits of magnetite were being concentrated, enabling low grade ores of 40 to 45 per cent., which would not stand the cost of transport, to be concentrated up to 70 to 75 per cent., with but small loss in tailings.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

8. John Robert Blanford, for "An improved chimney-pot."
61. George Arthur Jones, for "An expansion joint for pipes."
134. Henry Harris Lake, for "Improvements in pulleys."
161. Henry Ames, for "Improvements in fireplaces for domestic and other purposes."
204. Fred. Dale Gaywood, for "Adjustable divider for rules, blades of square or measuring instruments."
238. Alfred Seymour Jones, for "Improvements in chimney-pots or cowls for chimney-pots, or cowls for chimney and ventilating shafts."
254. Robert Adams, for "Improvements in means and appliances for opening, closing, regulating and fastening at any desired angle swing windows, ventilators, fanlights, flaps and analogous articles."
270. Alonzo Read, for "An improved means for fastening and unfastening window-beads."
286. Lawrence Clarke Tipper, for "Improved draw-plate, smoky chimney doctor and fire-preventer."
344. Johan Olof Lundberg, for "Improvements in valves."

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COMPETITIONS OPEN.

EAST GRINSTEAD.—Jan. 31.—Designs are invited for an Isolation Hospital. Premium £5 5s. Mr. W. Alsten Head, Clerk to the Union Sanitary Authority.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb. 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

SOUTHEND-ON-SEA.—Jan. 31.—For Designs for Shelters, Sea-baths, Photographic Studio and Shops. Mr. W. Gregson, Town Clerk, Southend.

CONTRACTS OPEN.

ABERDARE.—Feb. 1.—For Building Baptist Chapel. Rev. J. F. Williams, Brynderwen Villas, Aberdare Junction.

APPLEDORE, DEVON.—Feb. 6.—For the Erection of a Timber-framed Battery and Drill Shed for Royal Naval Reserve. Director of Works, Admiralty, 21 Craven Street, W.C.

BEDWAS.—Jan. 31.—For Additions to Board School. Mr. T. S. Edwards, 29 High Street, Newport, Mon.

BELFAST.—For Building Terrace of Houses. Mr. Henry Seaver, Architect, 128 Royal Avenue, Belfast.

BELFAST.—Feb. 1.—For Building Public Baths. Mr. Robert Watt, 77A Victoria Street, Belfast.

BEXLEY.—Jan. 31.—For the Supply of Paving Materials for Twelve Months from March 25. Mr. Sidney Matthews, Board Offices, Bexley.

BLACKBURN.—Jan. 29.—For Building Pauper Lunatic Asylum. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

BLACKBURN.—Jan. 30.—For Alterations to Board School. Messrs. Simpson & Duckworth, Architects, Richmond Chambers, Blackburn.

BLACKBURN.—Jan. 30.—For Extension of Mill. Messrs. Waddington & Son, Architects, 17 St. Ann's Square, Manchester.

BLACKPOOL.—Feb. 3.—For Making and Fixing Shop Fronts, Windows, Doors, &c., in Walnut, for Shops in St. John's Market. Mr. J. Wolstenholme, Town Hall, Blackpool.

CARDIFF.—Jan. 27.—For Extension of Board School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

CARISBROOKE.—Jan. 29.—For Building Boundary Walls for Extension of Cemetery. Mr. W. C. Way, Surveyor, Newport, Isle of Wight.

CONGLETON.—Jan. 27.—For Building Infant School. Mr. J. M. Bannerman, St. Stephen's Vicarage, Congleton.

CORK.—Jan. 29.—For Building Wesleyan Church and Sunday Schools at Barrackton. Mr. Robert Walker, Architect, 17 South Mall, Cork.

CRADLEY.—Feb. 9.—For Building Police Station, Cells, &c. Mr. Henry Rowe, County Surveyor, Worcester.

DEWSBURY.—Jan. 31.—For Construction of Embankments, &c., for Forming Two Reservoirs. Mr. G. H. Hill, Engineer, 3 Victoria Street, Westminster.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

GOLBORNE.—Jan. 29.—For Building Methodist Chapel. Mr. W. Graham, 121 Leigh Street, Golborne.

HAMPSTEAD.—Jan. 31.—For the Execution of Works and the Supply of Materials for One or Three Years from March 26. Mr. A. P. Johnson, Vestry Hall, Hampstead.

HANLEY.—Jan. 29.—For Electric Light and Fittings for Corporation Buildings. Mr. Joseph Lobley, Borough Engineer, Town Hall, Hanley.

HORSHAM.—Jan. 31.—For Building Police Station and Weights and Measures Office. Mr. C. Adcock, County Surveyor, 5 Queen's Square, Bognor.

ISLINGTON.—Feb. 6.—For Laying-in 559 Feet Glazed Socketed Drain Pipes and the Construction of a Tank and Filter Beds. Mr. G. W. Woodrow, Burial Board Offices, Vestry Hall, Islington.

LEEK.—Jan. 26.—For Additions to Boys' School. Mr. J. G. Smith, St. Edward Street, Leek.

LLANDUDNO.—Feb. 5.—For Bench of Retorts. Mr. E. P. Stephenson, Engineer to the Improvement Commissioners, Llandudno.

MANCHESTER.—Jan. 31.—For Building Stores, Show-room and Workshop. Mr. C. Nickson, Superintendent of the Gas Department, Town Hall, Manchester.

MANGOTSFIELD.—Feb. 6.—For the Construction of Main Outfall and Branch Sewers, Precipitation Tanks and Filter Beds, Erection of Sludge Pressing Buildings, Chemical Stores and Erection of Sludge-pressing Plant and Mixing Machinery. Mr. S. F. Andrews, Keynsham Union, Keynsham.

MARLBOROUGH.—Jan. 26.—For Providing and Laying Cast-iron Water Mains, Irregular Pipes, Valves, Hydrants and Consumers' Service Pipes. Mr. Ed. Llewellyn Gwillim, Town Clerk, Marlborough.

NORFOLK.—Feb. 3.—For the Supply of Broken Granite for One Year from March 31. Mr. T. H. B. Heslop, C.E., County Surveyor, Norwich.

PORTSMOUTH.—Jan. 30.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

RAMSGATE.—Jan. 29.—For Removal of Albion Hotel. Mr. H. B. Hammond, Clarence Baths, Ramsgate.

SALFORD.—Feb. 5.—For the Erection of a Higher Grade School in Victor Street. Mr. Ogilvie Duthie, School Board Offices, Salford.

ST. PANCRAS.—Jan. 29.—For the Execution of Works and the Supply of Materials for One Year. Mr. Charles Worrell, Vestry Hall, Pancras Road, N.W.

STROOD, KENT.—Feb. 1.—For Supply of Convertible Iron and Deal Tables, for the Dining-hall of Union Workhouse. Mr. G. Wilkinson Prall, Clerk's Office, Strood Union, Kent.

THURSO.—Jan. 27.—For Construction of Pier at Island of Strom and at Dwarwick Head. Mr. James Barron, Engineer, 7 Union Terrace, Aberdeen.

WALTON-ON-THAMES.—Jan. 29.—For Laying-out, Enclosing and Draining a New Cemetery, with the Construction of Stoneware Pipe Drains and Sewer. Mr. W. F. Vinter, A.M.I.C.E., 3 Little George Street, Westminster.

WATERVILLE, Co. KERRY.—Jan. 30.—For Building Coast-guard Station. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

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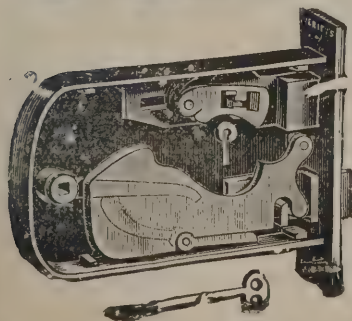
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For Building Twelve Dwelling-houses, Aberdare. Mr. CHARLES H. ELFORD, Architect.	
Richards, Hereford	£4,674 0 0
W. Bowers & Son, Hereford	3,920 0 0
W. Knight, Swansea	3,796 0 0
J. Jones, Aberdare	3,540 0 0
J. Owen, Aberdare	2,520 0 0
E. Owen, Navigation	2,385 0 0
S. HAWKINS, Merthyr (accepted)	2,100 0 0

BARNET.

For Providing and Fixing Cast-iron Eaves, Gutters, Rain-water Pipes, Fascias, and Soffits round Main Buildings at Workhouse, Barnet.	
C. J. Brown, Barnet	£132 0 0
J. Willmott & Sons, Hornsey	84 0 0
G. A. ORAM, East Finchley, N. (accepted)	71 10 0

CHIPPENHAM.

For Farm Buildings, Cottages, &c., at Euridge, Northwood, &c., for the Executors of the late Mr. R. Walmesley, Chippenham, Wilts. Mr. FREDERICK COLYER, Architect, 18 Great George Street, Westminster, S.W.	
W. WEBB, Bath (accepted)	£1,120 0 0

CARDIFF.

For Works in Connection with Extension of Dinas Powis Water Supply, Cardiff. Mr. W. FRASEK, Engineer, 14 Radnor Road, Canton, Cardiff.	
--	--

Contract No. 1.

W. Cox, Llandaff	£80 0 0
Evans & Jones, Cardiff	48 0 0
Wood & Son, Cardiff	44 5 0
J. Ridout, Dinas Powis	41 15 0
E. Lewis, Dinas Powis	39 15 0
F. Ashley, Cardiff	36 0 0
E. GARLAND, Dinas Powis (accepted)	30 0 0

Contract No. 2.

Evans & Jones	98 0 0
W. Cox	75 10 0
CROSS BROS., Cardiff (accepted)	66 14 6
Wood & Son	64 15 0
F. Ashley	60 3 0

CARDIFF—continued.

For Supplying and Laying Stoneware-pipes, Sluices, &c., Erecting Fencing required in Extending the City of Llandaff Sewage Filtration Ground, &c., for the Cardiff Union Rural Sanitary Authority. Mr. W. FRASER, Engineer, Cardiff.

Evans & Jones, Cardiff	£263 0 0
T. Rees, Ely, near Cardiff	146 15 7
F. Ashley, Canton, Cardiff	136 2 0
Wood & Son, Canton, Cardiff	133 10 1
W. Cox, Llandaff (accepted)	117 15 6

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WOOD & SON (accepted)	23 13 6

Ventilating Shaft.

F. Ashley	14 17 0
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WOOD & SON (accepted)	14 11 6

BRADFORD.

For Repairs and Reinstatement to Part of Premises recently damaged by Fire at Valley Mills, Bradford. Messrs. JAMES YOUNG & CO., Architects, 62 Market Street, Bradford.

All Trades

Davies & Jones, Manningham	£197 10 0
S. Wray & Co., Bradford	185 0 0
J. DEACON, Shipley (accepted)	149 0 0
J. Thirkhill, Bradford, mason and joiner	110 0 0
J. Ryder, Bradford, carpenter and joiner	43 0 0
T. Nelson, Bradford, slater	18 0 0

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For Waterworks at Dungiven, co. Londonderry, for the Guardians of Limavady Union, Supplying and Laying Pipes, &c., and Construction of Two Small Tanks.

T. R. Raynor, Bangor	£851 13 2
D. Christie, Coleraine	839 6 2
A. D. Williamson & Co., Coleraine	777 19 6
J. McLarnon, Belfast	770 0 0
Deeny, Dungiven	769 0 0
R. ROGERS, Limavady (accepted)	739 8 2
Stewart & Co., Glasgow (material only)	438 8 6

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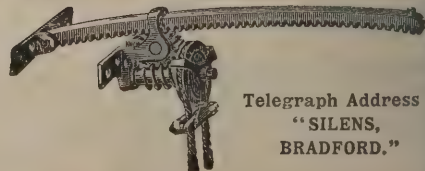
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J. HOROBIN (*accepted*) £280 0 0
For Sewering and Forming Streets, Fenton. Mr. J. T.
BREALEY, Surveyor, Piccadilly Buildings, Hanley.
Parkinson & Bower, Halifax £5,776 15 8
J. Burnham, Chester 5,095 0 0
G. Wild, Hanley 4,737 0 0
Jones & Fitzmaurice, Birmingham 4,705 0 0
F. Barke, Stoke-on-Trent 3,839 0 0
G. Horobin, Cobridge 3,430 0 0
H. P. EMBREY, Fenton (*accepted*) 3,111 13 0

FORD.

For Cottage-House at Doncombe Mill, Ford, Wilts, for the
Executors of the late Mr. R. Walmsley. Mr. FREDERICK
COLYER, Architect, 18 Great George Street, Westminster
S.W.
W. WEBB, Bath (*accepted*) £469 0 0

GARFORTH.

For Bricklayer and Joiner's Work (labour only) in the Erection
of 16 Houses at Garforth; also Plumber, Plasterer and
Painter's Work, for Messrs. Hoggate, Fairburn & Harri-
son. Mr. WILLIAM SQUIRES, Architect.
J. Powell, Leeds, bricklayer, &c. £1,000 0 0
H. Weatherell, Hunslet, joiner 800 0 0
J. Long, Leeds, plasterer 240 0 0
J. Brook, Leeds, slater 192 0 0
E. Stead, Leeds, stonework 160 0 0
Thompson & Sons, Leeds, plumber 128 0 0
Buckler & Cook, Leeds, painter 104 0 0

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For Paving, Cementing, &c., Western Half of South Pine
Street. Mr. J. BOWER, C.E., Borough Surveyor,
Gateshead.

Paving.

J. J. & J. Robson £183 11 0
G. E. Simpson 175 19 1
J. Wardlow 165 12 3
J. W. Robson 163 18 0
W. CUMMING, New Gateshead (*accepted*) 153 17 9

Cementing.

G. E. Simpson 34 7 6
W. Nevison 29 17 6
T. RULE, jun., Gateshead (*accepted*) 29 17 0

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D. Brook & Son, Halifax 2,799 9 0
G. Pearson, Cleckheaton 2,695 3 0
A. Bland, Halifax 2,350 4 8
R. Hopkinson, Halifax 2,223 18 11
H. TYSON, Halifax (*accepted*) 2,143 13 8

For Diverting a Portion of the Hebble Brook at Shroggs Scarr,
including the Erection of a Weir and a Goit, with Sluices,
&c. Mr. ESCOTT, Borough Engineer.

S. & W. Pattinson, Ruskington £6,739 0 0
R. Hopkinson, Halifax 6,116 19 9
E. & T. H. Riley, Halifax 5,359 9 1
A. Bland, Holmfield 5,253 8 6
H. Tyson, Halifax 5,010 2 6
J. CHARNOCK & SONS (*accepted*) 4,953 14 9
Engineer's estimate 5,400 0 0

HEREFORD.

For Sanitary Arrangements at Shire Hall, Hereford, for the
County Standing Joint Committee. Mr. H. T. WAKELAM,
County Surveyor.

W. P. LEWIS & Co., Hereford (*accepted*).

HUDDERSFIELD.

For Conversion of the Huddersfield College into a Higher
Grade Board School. Mr. BEN STOCKS, Architect, New
Street, Huddersfield. Quantities by the Architect.

Crowther & Wilkinson, Huddersfield, joiner . . . £818 10 0
J. Radcliffe & Sons, Huddersfield, mason . . . 745 10 0
Calvert & Co., Huddersfield, hot-water engineer . . 517 10 0
George Garton, Huddersfield, plumber . . . 394 15 0
T. W. Broadbent, Huddersfield, electric lighting . . 187 10 0
T. B. Tunncliffe, Huddersfield, plasterer . . . 138 0 0
H. Cross & Son, Huddersfield, painter . . . 120 0 0
W. E. Jowitt, Huddersfield, slater . . . 19 0 0

LEOMINSTER (HEREFORDSHIRE).

For Renovations (Contract No. 2) at the County Police Station,
Leominster, for the Standing Joint Committee. Mr. H.
T. WAKELAM, County Surveyor, Hereford.

G. PAGE, Leominster (*accepted*).

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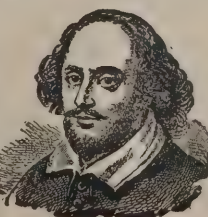
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Killingback & Co., Camden Town	125	0	0
T. Adams, Wood Green	119	0	0
PORTER & HARRISON, Aldershot (accepted)	110	0	0
Surveyor's estimate	120	0	0

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J. Forrester, Cupar, Fife, joiner	165	8	4
W. Smith, Cupar, Fife, plasterer	62	14	0
C. Brand & Co., Yeaman Shore, Dundee, slater	59	16	6
D. Brown, Cupar, Fife, plumber	13	0	0

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For Completing the Overton Sewerage Works, for the Ellesmere Rural Sanitary Authority. Mr. W. WYATT, Engineer, Pride Hill Chambers, Shrewsbury.

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J. Brown, Shrewsbury	160	2	11
G. WILLIAMS & SON, Penley, Ellesmere (accepted)	157	5	10

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For Building Stables, &c., Butchers' Arms Hotel, Pontypridd. Mr. F. GIBSON and Messrs. VEALE & SANT, Joint Architects.

T. Evans, Cardiff	£1,090	0	0
D. Griffiths & Co., Pontypridd	1,049	11	0
D. C. Jones & Co., Gloucester	1,020	0	0
A. Richards, Pontypridd	962	18	0
Williams & James, Pontypridd	948	15	0
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J. C. RICHARDS, Hereford (accepted)	765	9	0

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For Supplying and Fixing Mahogany Fittings in Office in Castle Street, Liverpool, for Mr. W. H. Walker. Mr. W. J. SMITH, Architect.

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Morris Bros.	887	10	0
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G. Waizborn & Son, St. Helens	8,295	0	0
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J. Rothwell & Son, St. Helens	7,999	0	0
F. Clarke, St. Helens	7,997	0	0
W. Molyneux, St. Helens	7,995	0	0
W. Hall, Liverpool	7,948	0	0
R. Davies, St. Helens	7,900	0	0
Hughes & Stirling, Liverpool	7,897	0	0
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Morrison & Sons, Liverpool	7,840	0	0
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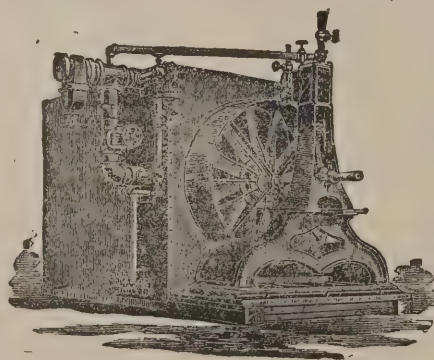
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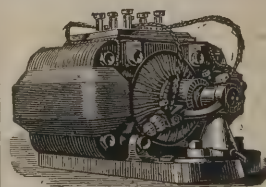
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Adams	289	0	0
Fry Bros.	273	0	0
ILES BROS. (accepted)	245	0	0

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Isler & Co.	2,826	0	0
Tilley & Sons	2,156	0	0
Timmins & Sons	1,671	9	0

For Building Engine and Pump-room, Lower Market Street, Woolwich, for the Local Board. Mr. H. H. CHURCH, Architect, William Street. Quantities by Mr. WALTER WHINCOP.

Lorden & Sons	£514	0	0
H. L. Holloway	473	0	0
Woolwich Co-operative Building Society	466	0	0
Battley, Sons & Holness	464	0	0
London Amalgamated Builders' Society	421	10	0

TRADE NOTES.

At Hebdon Bridge parish church on Tuesday last a large clock and bells, which have been presented to the church by a lady of the congregation as a memorial to her late husband, were formally started by the Bishop of Wakefield. The clock, which is of the best construction, contains all the latest improvements and shows the time upon three dials, each measuring 4 feet across. It is also constructed to chime the Westminster quarter chimes and strike the hours. Both clock and bells have been manufactured and fixed by Messrs. Gillett & Johnston, the well-known clockmakers and bell-founders of Croydon, who have in hand at the present moment the large clock and bells for the Croydon New Municipal Buildings, also that for Messrs. Barclay's Brewery, Southwark, and many others.

At the meeting of the Warwickshire County Council, the tender of Mr. Jacob Biggs was accepted at 1,349*l.* for rebuilding Stechford Bridge.

THE new hospital, Liscard, Cheshire, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

ABOUT ten years ago Messrs. Merryweather & Sons, supplied a powerful floating fire-engine for the harbour of Alexandria to the order of the Egyptian Government. They have now built a still larger boat for the Alexandria Chamber of Commerce. The new "float" is for service on the Mahmoudieh Canal, for the protection of the cotton warehouses which line its banks. It is of steel, and is 60 feet long, 10 feet 6 inches beam, and draws only 18 inches of water. Steam can be raised from cold water to 100 lbs. pressure in ten minutes. The engine is of the "Greenwich" pattern, with two steam cylinders and a pair of double-acting gun-metal pumps. The capacity is 2,000 gallons of water per minute, and there are several hose connections, so as to enable a fire to be surrounded. As the boat is not intended for seagoing work, a means of hydraulic propulsion has been adopted, water being discharged astern through jet pipes, and a speed of four miles an hour being thus obtained. In this way propelling engines, shaft and screw are dispensed with, and a great saving of weight is effected. Hand-wheels enable the jets to be reversed together or separately, so that the boat can be turned into her own length or go astern in a dock or narrow canal.

WE wish to call the attention of our readers to a notice which appears in our advertisement columns respecting Messrs. Leggott & Marsh's system of fuel and smoke consumption, which is applicable to all coal fires, and most economical in prevention of soot deposit, and consequently in cost of chimney-sweeping. We refer readers to the evidence we publish on the part of architects, experts and the public generally, which ought to prove satisfactory.

THE Works Committee of Dundee Police Commission at their meeting had the subject of the west-end bathing-pond under consideration. The convener and burgh engineer reported that the lowest tenders for the construction of a bathing-pond on the site, viz. on the made-up ground immediately on the west side of the ground belonging to the North British Railway Company, amounted to 1,800*l.* 1*s.* 10*d.*, and that the commissioners had already approved of the construction of a pond at a price not exceeding 2,000*l.*

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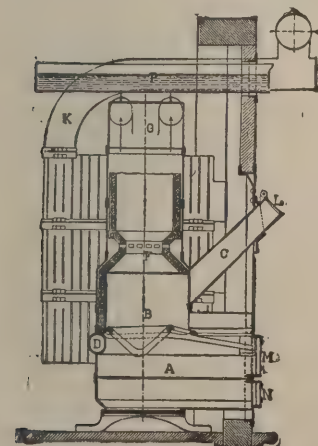
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These Apparati are capable of Warming Fresh Cold Air at any outside Temperature, and in volume from one to three times the cubic capacity of the premises to be treated. A minimum inside temperature of 55° Fah. with an actual air change of either one, two, or three times per hour being guaranteed with my reliable system of ventilation.

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ESTAB.

1829.

BUILDING AND BUILDERS.

THE Dover Harbour Board (of which the Marquis of Dufferin and Ava is the president) have decided to commence a system of quayside warehouses by the erection of two blocks of commodious buildings at the Granville Dock. The warehouses will provide such accommodation as is required by ocean-going steamers.

AT Glasgow the new wharf for American cattle at Point-house has been formally opened. In the new buildings and the contiguous east lairage 4,000 cattle may be received at one time for inspection and slaughter. The cost of the buildings, with fittings, will be about 40,000/.

THE annual dinner of the Barnsley Master Builders' Association has just been held, Mr. H. Hinchliffe, the retiring president, in the chair, supported by Messrs. W. Dunk (treasurer), E. R. Taylor (secretary), Moore, Bycraft, Lawton, Wright, Foster, Guest, Higham, Porter, &c. Justice having been done to the good things provided, the company proceeded to business. The first item was the election of officers for the ensuing year. Mr. Dunk was elected president, Mr. Councillor Taylor vice-president, Mr. Aaron Wood treasurer, and Mr. F. Walker secretary. Various toasts were then honoured. Mr. W. Dunk proposed "The Building Trades of Barnsley." In spite of discouraging signs, he trusted there would be plenty of work for them in the year which had just opened. He was pleased to think that they had been moderately busy in the year which was past. There had been over 200 new buildings erected during the twelve months, or an increase of more than sixty over the record for the year before. It had been a pleasure to them to work harmoniously with the various architects and with the Corporation officials, a state of things which he hoped would continue.

It is proposed to acquire a piece of land at the junction of Albacore Crescent and High Street, Lewisham, for building a fire station, to take the place of the small and inconvenient one at Rushey Green.

OWING to the liberality of the Fielden family to the town of Todmorden, buildings and land which comprise the new infectious diseases hospital have been handed over to the hospital committee of the Todmorden Local Board on behalf of the joint hospital committee of the Todmorden Union. The hospital comprises four blocks of buildings. The administration block affords accommodation for the staff. Behind this is the principal hospital, in which are one ward for

children with two beds, one for adults with eight beds, and one with six beds, in addition to the nurses' rooms, hall, &c. The isolation block will be used for cases of diphtheria and other highly infectious cases. In this are two wards with one bed each, and two wards with two beds each. The fourth block is set apart for laundry purposes and disinfecting clothing, &c. All the buildings are fitted up in the most approved style, from plans by Mr. John Sutcliffe, architect, Todmorden. The entire cost is about 6,000/., and has been defrayed by Mr. J. A. Fielden, Centre Vale, Todmorden, in accordance with the wish of his deceased father, Mr. Samuel Fielden.

ELECTRICAL.

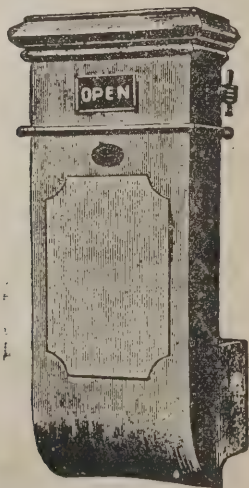
WE have had the pleasure of inspecting the showrooms of Messrs. Ball Bros. & Bates, electric light engineers, 118 Holborn, E.C. We noticed that a special plant has been laid out on the premises for practical electrical engineering, and a special feature is the showrooms devoted to high-class electric light fittings. Mr. Tatley, who has had considerable experience in contracting work, is in charge of the installation department, and increased business should result from his accession to the firm.

AT the meeting of the Royal Scottish Society of Arts, a paper, read on behalf of Mr. Ramsay Taylor, described a system of electric railway signalling, the object of which was to prevent an engine driver running past a signal set at danger carelessly or in foggy weather. The general description of the apparatus is as follows:—A small electric bell is placed on the engine, near the engineer's head. It is actuated by means of a wire brush so fixed under the engine as to make contact with a conductor laid along the track and connected with the signal cabin. When the signal is put at danger, it automatically completes an electric circuit, which causes the bell on the engine to ring. One of the advantages claimed for the system is that it does not interfere with the existing system of signalling. A working model was exhibited. The paper gave rise to some discussion, chiefly with regard to the difficulty of securing insulation of the conducting wire, especially in wet weather, and the difficulty of fixing the attention of the driver on an engine travelling with great noise at a high rate of speed.

PREPARATIONS are being made in the crypt of St. Paul's Cathedral for the laying of plant for the electric light. The chief difficulties which beset the electricians are the height of the dome and the width of the building. There will have to be

BANK AND OFFICE INTERIORS.

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In the above we have introduced a most important improvement. It consists of an Enamelled Indicator, showing from any position when the Ventilator is open or shut. By this means all uncertainty is removed, and any person can see at a glance whether the ventilator is acting or not. The ordinary ventilator is often rendered quite useless by being shut off when it is supposed to be open, the only means of ascertaining the fact for a certainty being by holding the hand over the inlet, which is often difficult of access.

We shall be pleased to send a Model of Full-sized Ventilator on approval, carriage paid to any Architect for inspection.

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two sets of lights—an arc light in the dome for architectural effect, and incandescent lights at a level of about 25 feet from the floor. The gas-jets are, it is found, injurious to the new decorations.

VARIETIES.

THE *Glasgow Herald* says:—By the death of Miss Margaret Macfarlane, of Monkshaw, Paisley, a number of public bodies have become entitled to legacies amounting, in all, to 8,950*l.* A sum of 1,750*l.* is bequeathed to the Orphan Homes of Scotland for the erection of another cottage, and 2,000*l.* to the Paisley Infirmary. 3,000*l.* is set aside for bursaries in connection with Glasgow University.

THE London and North-Western Railway Company, it is stated, contemplate spending over 100,000*l.* in alterations and extensions of Crewe Station. Plans involving great alterations have been deposited with the local authorities.

AT Lochee, the Rev. Dean Turner, Perth, delivered a lecture in St. Mary's Hall illustrative of a visit to the World's Fair in Chicago, and other cities in the United States, as well as in Canada. There was a large audience, and the Rev. Father Van de Rydt occupied the chair.

THE Great Western Railway Company propose to introduce an omnibus bill next session for power to create and issue 1,000,000*l.* additional share and loan capital. This capital is required for general purposes and for the construction of nearly thirteen miles of new railways in North and South Wales, and over thirteen miles of railways in substitution for an authorised line connecting their Berks and Hants Extension Railway with their Wilts, Somerset and Weymouth line.

A VESTRY meeting has been held at St. Michael's Church, Stoke Prior, to consider plans and a report on the restoration of the church. The Rev. C. Stockdale, vicar, presided. Plans for the work and a report by Mr. J. L. Pearson, R.A., were submitted and approved. The meeting confirmed the application for a faculty to carry out the restoration, the estimated cost of which is about 4,000*l.*, the whole of which will be contributed by Mr. John Corbett, with the exception of 123*l.* from the Ecclesiastical Commissioners towards the chancel.

THE current number of *Work*, an illustrated weekly journal for mechanics, keeps to the forefront in its special department. The proprietors have once again added to the number of pages and given an illustrated supplement.

ON Wednesday morning another vessel was launched from Earle's shipbuilding yard, for the Great Eastern Railway Company's Harwich-Hook of Holland service. The christening ceremony was performed by Mrs. Van Hasselt, wife of one of the directors of the Holland Railway (the line running from the Hook of Holland), and many members of the Amsterdam Town Council were also present, showing the importance attached to this new service by the city of Amsterdam. This vessel, named the *Amsterdam*, is a steel twin-screw steamer of about 1,700 tons gross register, 302 feet long and 36 feet beam, and when placed on the service will, with her sister vessel the *Berlin* (which was launched on the 10th inst.), be the two largest passenger steamers running between England and the Continent. She is fitted with two entirely separate sets of triple-compound engines, designed to develop 5,000 horsepower, giving a speed of 18 knots an hour. The cabin accommodation of the *Amsterdam* will be similar to that of her sister vessels the *Chelmsford* and *Berlin*. These steamers have all been specially built for the Hook of Holland service, and it is intended shortly to supplement this new fleet with another vessel of similar size and speed.

THE *Railway World*, Philadelphia, says:—Near a railway terminus in Paris the experiment is being tried of paving the street with solid mahogany. The announcement seems to promise a startling instance of extravagance. The report, however, states that the cost will be probably considerably less than ten dollars a square yard. The wood, of very fine texture, is Brazilian mahogany, believed to be of so durable a quality as to fully warrant the outlay. This luxury recalls to memory the fact that a railway bed in Georgia was once ballasted with marble, while a bridge on its track was built of the same precious material. The road ran through hills which were filled with marble of a superior quality, then regarded in the neighbourhood as an ordinary stone, the virtues of which were as yet entirely undiscovered. With its elegant bridge and luxurious ballast, the road probably in a very short time repaid its debt to the locality with a large interest by demonstrating the value of the stone, stimulating a demand, and carrying the marble to a more appreciative market, which it might never have reached without its vigorous intervention.

THE *Medical Press and Circular* says:—"The fact is often overlooked that a damp cellar in a house is a very serious drawback to the healthiness of the residence. Strictly speaking, after the drains, nothing is more important than to ascer-



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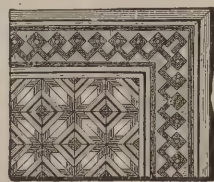
Output 700 tons weekly.

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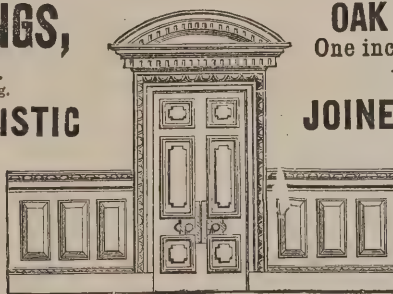
One inch and $\frac{1}{4}$ -inch thick.
Immense Stock always ready for Laying.



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5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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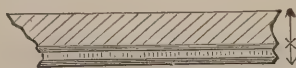


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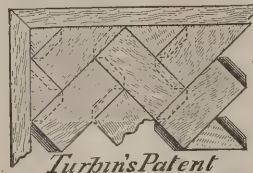
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Turpin's Patent

System of Preparing for Laying inch Block Floor on Concrete, Stone, and Deal Floors

Section of wood block floors



Turpin's Patent

Concrete floor

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tain the condition of the cellar. For the most part, architects are content to pay little or no attention to the sanitary principles which should guide them in its construction." The writer of the above paragraph, evidently through inadvertence, has confounded architects with jerry-builders. All the same, it is ridiculous that such a stale joke should from time to time appear in print, like the perennial sea-serpent paragraphs.

THE February number of the *English Illustrated Magazine* well supports its character as an illustrated periodical. Light matter is judiciously mixed with more serious reading. In "Coster Land" there are many happy hits accompanied by characteristic drawings.

THE thirty-ninth annual report of the Wesleyan Methodist General Chapel Fund Committee states that the committee have sanctioned the erection of 100 chapels, costing 126,753*l.*; 17 ministers' houses, 13,433*l.*; 15 schoolrooms, 12,155*l.*; 120 alterations and enlargements, 60,379*l.*; 83 modifications, 23,950*l.*; 29 organs, 10,049*l.*; total, 246,719*l.* The average cost per sitting in the new chapels is estimated at 4*l.* 11*s.* 9*d.*, which is 13*s.* 14*d.* per sitting less than last year's estimate. Of the new chapels 43, to accommodate 10,272 persons, will be in places where hitherto there has been no Wesleyan Methodist chapels; 57, providing accommodation for 17,356 hearers, supersede former erections providing for 11,035; so that the total gain in sittings, including the gain in enlargements, will be 19,311.

THE Junior Engineering Society celebrates its ninth anniversary by a dinner to be held at the Holborn Restaurant to-morrow (Saturday) evening, the president, Mr. J. Wolfe Barry, M.Inst.C.E. in the chair, being supported by Sir E. J. Reed, M.P., Sir Philip Magnus, Mr. W. H. White, C.B., of the Admiralty; Mr. A. Giles, president of the Institution of Civil Engineers; Mr. A. R. Binnie, chief engineer to the London County Council, and Professor John Perry, F.R.S.

A lift is being erected in the Victoria Tower, Windsor Castle, for the convenience of the Queen when Her Majesty goes out walking or driving. The apparatus is being arranged upon the north side of the building, and is only a few yards from the Sovereign's entrance in the Grand Quadrangle.

THE *British Medical Journal* says:—Dr. Boobyer, of Nottingham, told an amusing story concerning Mr. Justice Hawkins at a meeting of Midland medical officers of health, held at the Birmingham Council House. Mr. Justice Hawkins was at Nottingham on assize business, and at night he noticed

a bad smell in his bedroom at the judges' lodgings. It annoyed him, and with characteristic promptness he got up and had the quiet slumbers of the clerk of the peace disturbed in order that fresh lodgings might be found for him. The incident at the time was thought amusing by all except the gentlemen who lost their sleep, but its after-consequences were serious. On examining the room the drainage arrangements were found to be about 150 years old, and owing to a defective trap a cess-pool ventilated itself into the room. Until then there had been no marked instance of disease arising from this state of things; but four members of the City Council died from disease contracted when inspecting the cesspool.

AMONG the prominent and attractive stands at the Dundee Exhibition of Industries is that of Messrs. John Farquharson & Son, registered sanitary plumbers, brass-founders and gas engineers. Here are to be seen the new incandescent light, Siemens's lamps, gas-saving economisers—exhibited by an ingenious automatic arrangement which shows their value in increasing the illumination. Anderson's patent bye-pass fittings, Parkinson's governor burner, Fletcher's handy pocket burner—tester are attached to a test-meter to demonstrate the hourly consumption of any burner on the observation of one minute. Two highly artistic washhand basins, mounted in cast-iron, and finished in a new patent enamel called "chimatto," which resists all action of either acid or heat, are also on view. In a handsome case is a splendid collection of brass ornaments and castings in aluminium of Royal Arch and Old Custom House, Greenmarket. Samples of metal used in the trade are also shown, and a very fine specimen of Australian lead ore. Gas boiling and heating stoves in great variety and a unique labour-saving gas laundry-stove and irons are also exhibited.

THE directors of the Southport and Churchtown Botanic Gardens and Museum Company, Limited, have recommended a dividend at the rate of 8 per cent. per annum.

AT the meeting of the Midlothian Camera Club, Edinburgh, Mr. A. Scott read a paper on "Marine Photography," illustrated by limelight, with numerous fine examples of this class of work.

THE committee of the Blackburn Rovers' Football Club have completed the purchase of Ewood Park. The club had already spent 3,000*l.* in the fitting of the ground, and they now propose to erect on the south side of the ground a huge covered stand. The ground will be the largest in England, and the accommodation will be equal to nearly 40,000 spectators.

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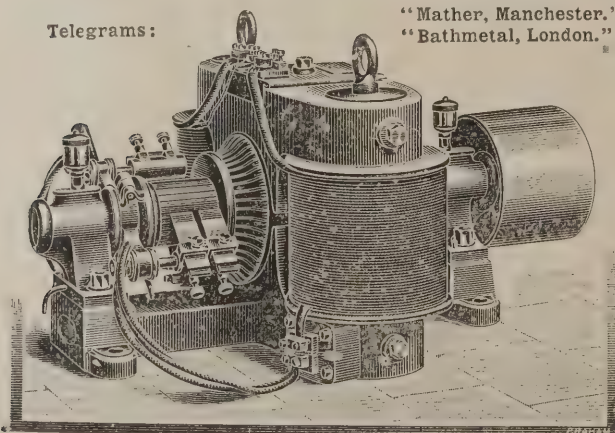
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with a Cistern Filter.

PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. Vide Professor Frankland's Reports to the Registrar-General, July 1866, November 1867, and May 1870. The *Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10*s.* and upwards.

Portable Filters on this System, £1 5*s.* to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession and at the London, Middlesex, St. George's, St. Mary's Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4*s.* 6*d.* and 6*s.* each. Household and Fancy Filters, from 1*s.* Water-testing Apparatus for detecting Impurities in Water, 10*s.* 6*d.* and 12*s.* each.

157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



AT a meeting of the Southport Tramways Company, Limited, the directors recommended a dividend at the rate of 9 per cent. per annum for the past half-year.

AN important discovery of coal has been made at Forest Row, Kent, workmen while engaged in sinking a well having come upon a thick seam of coal. This is the second discovery of the kind in the county, a similar seam having been struck in some brickfields on the borders of Kent and Sussex. It is believed that coal exists in large quantities in East Kent, and a committee of county gentlemen has been formed for the purpose of prosecuting experiments, with a view to opening up coalfields.

A SERIES of fine-art plates, produced in collotype, are being prepared for issue with the new serial edition of "Cathedrals, Abbeys and Churches of England and Wales," Part I. of which will be published by Messrs. Cassell & Co. with the February magazines.

THE town of Cleethorpes is already well sewered and paved, and in a good sanitary condition. Its sewers, however, deliver through an outfall sewer, about one mile long, into the Humberstone Beck. The rough solids are first taken out by means of a settling tank. The Humberstone Beck delivers into the sea, but it is tide-locked for a few hours each tide. During this time the sewage backs up the Beck inland. The Humberstone Beck is too far from the town to cause residents or visitors any annoyance, but complaints have been made of the nuisance caused by this arrangement by neighbouring landowners and farmers at some periods of the year. The Local Board have instructed Mr. W. H. Radford, C.E., of Nottingham, to prepare plans of a new iron pipe sea outfall, to take the sewage 1,200 yards out to sea and discharge it near low-water mark. Certain additions will also be made to the flushing, inspection and ventilation arrangements of the town sewers. The works may cost about 4,000*l*.

THE rebuilding fund for Holy Trinity Church, South Shore, Blackpool, has now amounted to 3,500*l*., and steps, it is reported, are being taken for commencing the work next month or early in March.

The *Birmingham Post* says:—By order of the Improvement Committee of the Birmingham City Council, Messrs. Thomas & Bettridge have sold the Winter Garden pavilion by auction. The sale was well attended, and the wood and iron pavilion, which is 170 feet long by 100 feet wide, was eventually sold to Mr. Warden, Edgbaston, for 155*l*.

ELECTRIC LIGHT IN MANCHESTER.

AN exceptionally interesting meeting of the Manchester Literary and Philosophical Society was held on Tuesday, the *Manchester Guardian* says, when Mr. Henry Wilde gave a demonstration of the uses of the Manchester Corporation supply of electricity for illustrating communications to the Society in several branches of experimental philosophy. Not only is it to the generosity of Mr. Wilde that the Society owes the installation by means of which the venerable house where Dalton lived and Joule studied is now illuminated; but, in a much wider sense, it is to him that the Society and the city owe the commercial possibility of the beautiful light which is now rapidly spreading to the shop windows, public buildings, workshops and mills of the district. It was in the early part of the year 1866 that Mr. Wilde invited the Council of the George Street Society to a private exhibition of the powers of a new generator of electricity, based on his discovery of the principle that quantities of magnetism and electricity indefinitely small could induce quantities of those forces indefinitely great. That machine was christened a dynamo-electric machine, a term which has since been contracted to the simpler form "dynamo." Amongst those present on the historic occasion referred to were Dr. Joule, Dr. Angus Smith, Professor Clifton, Mr. Joseph Baxendell and Mr. Binney. The new machine far surpassed any of its predecessors in the luminous and calorific effects produced, but Mr. Wilde frankly told his audience that neither he nor any of those present had any idea that electricity generated by the new method would within the next twenty-eight years be supplied like gas and water by the Corporation of the city of Manchester. Many improvements in the dynamo have since been made by Mr. Wilde and others; but the principle of accumulation enunciated and demonstrated by Mr. Wilde is common to them all, and Mr. Wilde's machine may well be spoken of as the parent of those now in practical use for generating light on a large scale. Later on, in 1868, Mr. Wilde read another important paper before the Society, announcing his discovery of the synchronous rotations of the armatures of a number of dynamo-electric machines, by means of which their united power can be obtained without the use of mechanical gearing, a principle which is being largely utilised in the United States, and is in process of further development at the electro-mechanical power station at Niagara, as well as at lighting stations in this country and on the Continent.

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SKETCHES IN BELGIUM. HUON. A. MATEAR, F.R.I.B.A.)

REMEDY AGAINST LEAD POISONING.

AT the Industrial Exhibition held in Bradford, the exhibit of Messrs. E. Walker & Co., of Heckmondwike, from a sanitary point of view attracted special attention. Everyone prefers soft water to hard water, and Yorkshire seems particularly favoured in this respect. Soft water, however, has the serious disadvantage that so many die from its use owing to lead poisoning. Various pipes have been designed to free soft water from the foreign and dangerous elements it acquires by its passage through lead pipes. Iron pipes were previously used as the only alternative. Glass-lined pipes and zinc-lined pipes were next tried, but failed for various reasons to give full satisfaction. It is to the credit of Messrs. Walker & Co. that their "Health" water pipe has been found to be the pipe that was wanted, and that it is in consequence being extensively adopted. Messrs. Walker & Co. are evidently justified in claiming that their "Health" water pipe is the strongest, purest and safest water pipe in the world. This health water pipe consists of a strong serviceable wrought-iron tube, with an internal lining of pure block-tin, so united at the surface as to render it absolutely inseparable by the action of water.

THE Earl of Wharncliffe, when addressing the members of Mappin & Webb's art class, consisting of their workmen at Sheffield, on Wednesday, complained that much of the plate produced in England was offensive in form and ornamentation to a cultured mind, and contrary to true art. He thought the remedy for these defects was in training the craftsman himself to discriminate between good and bad work, and to accomplish this more art classes should be established. He suggested that Sheffield should try and attain distinction in ornamental hammered ironwork.

SURVEYORS' FEES.

AN important action, Beck and Another v. Smirke, was tried before Mr. Justice Wills (without a jury) on Saturday. The plaintiffs sought to recover damages for defendant's negligence as a surveyor and valuer.

According to the *Times* report, the plaintiffs were trustees under a marriage settlement, and in 1889 they had in their hands 1,000*l.* of trust money uninvested and were looking out for an investment. They mentioned it to some surveyors, who said that they knew of a house at Strawberry Hill, Twickenham, upon which the builder, Mr. Hart, was looking for an advance. Mr. Beck saw defendant, told him they were trust funds, and asked him if he knew the value of property in that neighbourhood. The defendant said he was a resident at Strawberry Hill and was well acquainted with the value of property there. It was then agreed that defendant should report upon the property. The defendant reported that the houses in that road were let from 90*l.* to 100*l.* each, that No. 26 was a well-built house, nearly completed, worth 1,800*l.*, and therefore a safe investment for 1,000*l.* The plaintiffs upon this report advanced the builder 1,000*l.* The builder did not pay the interest nor complete the house, owing to financial difficulties. The house, owing to there being no tenant, got into disrepair, and the plaintiffs had to expend 200*l.* upon it. They were also put to expenses in a foreclosure suit and other incidental expenses, making together over 400*l.* The house was sold in July, 1892, by public auction for 810*l.*, and the plaintiffs claimed as damages the difference between that sum and their advance, *plus* all the incidental expenses, amounting to 588*l.* For the plaintiffs evidence of surveyors was given that the value ought to have been estimated upon the letting value and not the structural value. That the fair rental of the house was 65*l.*, and was not a sufficient security for an advance of 1,000*l.*

Mr. Chancellor, estate auctioneer, who sold the house, gave evidence, and said that the sale was a fair one, the letting value being 80*l.* on a three years' agreement, the landlord doing the repairs, and 70*l.* upon repairing lease. It was worth fifteen years' purchase.

For the defence the defendant, Mr. Sydney Smirke, was called, and said he was an architect and surveyor. He went and visited the property on several occasions. He reported on April 18 that No. 26 would be finished in three weeks, and that it required papering. He had several interviews with Mr. Beck. He added to his report that he could not ascertain the rateable

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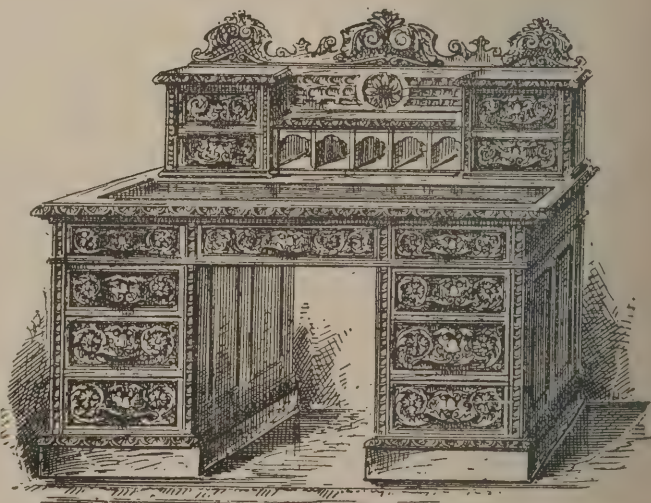
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value, and that the property was worth 1,800*l*. He told Mr. Beck that the house was unfinished and unlet. He communicated to Mr. Beck that it would take 25*l*. to 30*l*. to finish the house. Mr. Beck said he thought it would be safe to let the builder have the money, and he would deduct 30*l*. as interest paid in advance. Mr. Beck told him that Mr. Breach told him that Hart was not a speculative builder. In March, 1890, he heard Hart was bankrupt, and he went down to see the property and found it terribly wrecked, without any caretaker. On April 25 he visited the premises again. He thought it would take 120*l*. to make the house fit for letting. He visited the houses again in May. At that time the money ordered by the Court of Chancery had not been expended.

Cross-examined:—He arrived at the 1,800*l*. (1) upon rental value; (2) the cubical contents; (3) by comparing it with other properties. He valued the building at 1,400*l*., and the land at 400*l*. He took the 250*l*. as the value of the land before development. He estimated the 400*l*. upon the basis of ground-rent. He arrived at the 1,400*l*. for the building upon an estimate upon the cost price of the building. He did not ask Messrs. Egerton & Breach what they had certified for. It was not the only way of arriving at the value of the house to ascertain what it would let for. He thought the clear rental value was 90*l*. He told Egerton & Breach that he was going to put the rent at 90*l*., and Mr. Breach said that would do. He did not ascertain what the other houses in the road were let for. He estimated the value upon the basis of twenty-two and a half years' purchase of 81*l*. rental.

Two other surveyors were called for the defendant, who stated that they estimated the value of the house upon the basis of twenty to twenty-two years' purchase of the net rental, which they put at 80*l*. It was a sufficient security for an advance of 1,000*l*.

Mr. W. H. Gibbs, of Messrs. Flews & Gibbs, builders, said he had obtained advances of 1,000*l*. upon some of the houses in Strawberry Hill Road built by him. The cost of the house would be about 1,900*l*.

Mr. Barella, the purchaser of the house, was called and said the house was now let at 75*l*. a year, the tenant doing repairs.

Mr. Justice Wills:—The first question was, which way was the verdict to go? As to that he had not a shadow of doubt. A surveyor who was employed had to use competent care in making his report. All the defendant thought was necessary was to ask whether the house was worth 95*l*. a year. He could not see that there was any justification for the statement of

defendant that the houses were worth from 90*l*. to 120*l*., whereas it was stated the rents averaged 80*l*. to 85*l*. The defendant never took the trouble to ascertain whether the tenant or the landlord was doing repairs. The defendant himself admitted in ascertaining the value it was necessary to get the net rental and multiply by the number of years' purchase. The valuation was made in a most careless manner. Even after the person who wanted to borrow said the house was worth 1,500*l*. the defendant brought it up to 1,800*l*., and when it was stated that 1,200*l*. had been spent on the house the defendant brought that figure up to 1,400*l*. Upon the evidence the value for the purpose of borrowing money ought not to have been put upon the house. With regard to Mr. Gibbs's evidence, he was disposed to think that he had been financed by someone, and what that person lent on the houses said to be similar was no criterion here. The fair rental value of the house would be about 80*l*. Sixteen to eighteen years' purchase was much nearer the mark than twenty-two and a half as stated. To say that property such as this was worth twenty-two and a half years' purchase surprised him. The defendant knew he was advising trustees and the margin of one-third was important, as it was meant to cover all sorts of contingencies, of which an auction sale was one. With regard to the damages, the great cause of the loss was that the money was advanced upon an uncompleted house. Upon the defendant was cast the responsibility of inquiring into the condition of the house, not into the financial position of the builder. It was quite plain that plaintiffs were anxious to make the advance, because the defendant said it would be much better that plaintiffs should hold back the money till the house was finished. The difficulties which led to a large portion of the loss were such as ought to present themselves to a lawyer and not to a surveyor, namely, that the mortgagee could not do the repairs without a foreclosure suit. All the expenses of the foreclosure suit and damage to the house it would be unfair to put upon the defendant. The advance and fair charges made up about 1,100*l*. He took 810*l*. as a fair sale price at the time, but he thought the house would have sold better if put earlier in the market, and he would give credit for a little more. He therefore thought if he gave judgment for 200*l*. he would be doing justice in the case.

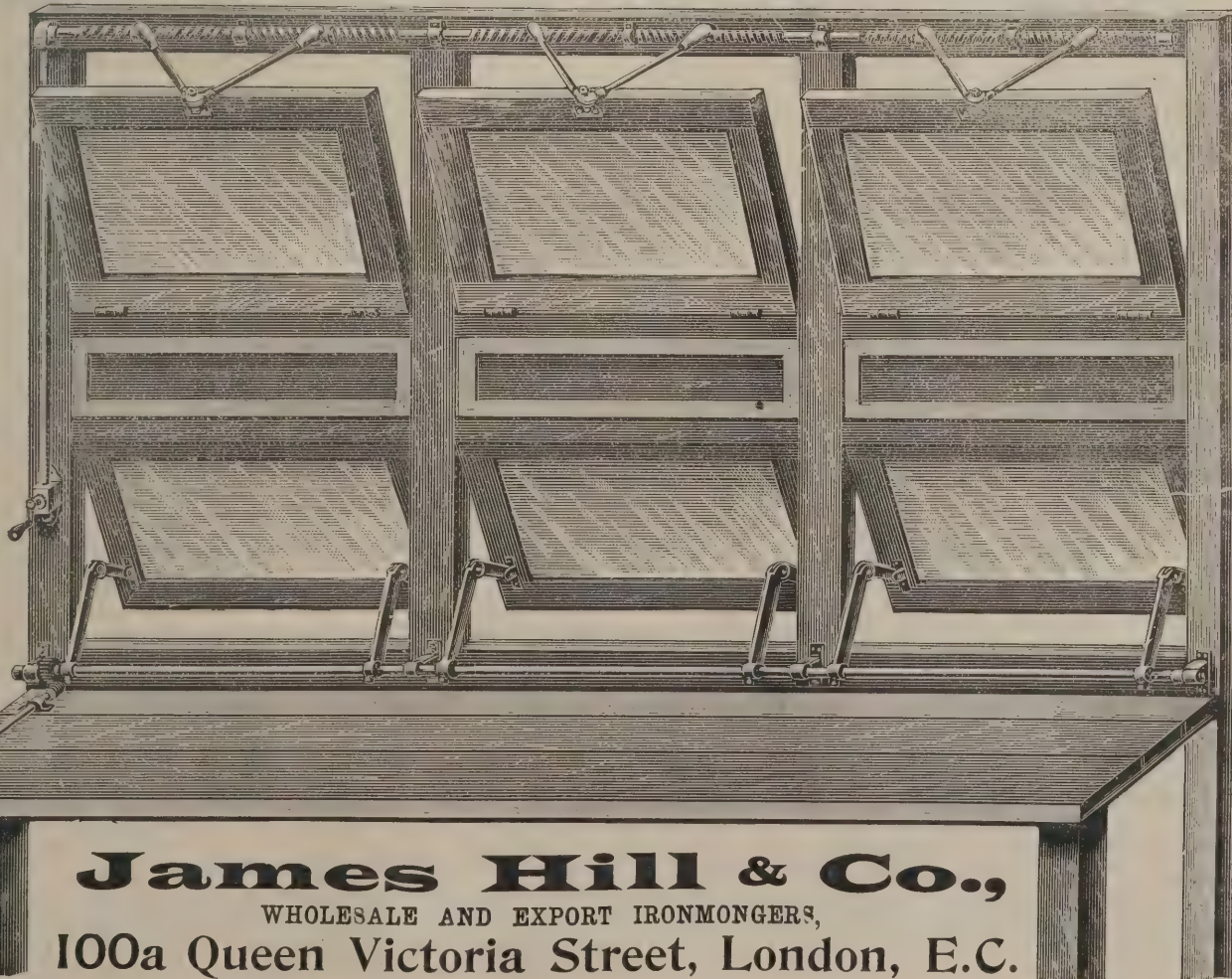
Judgment for plaintiffs for 200*l*. with costs accordingly.

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LEEDS BUILDERS' EXCHANGE.

THE second annual meeting of the members of the Leeds Builders' Exchange was held on Tuesday. At the opening of the proceedings the meeting was presided over by Mr. Edward Walker, the hon. treasurer, but at a later stage of the business he vacated the chair in favour of the president of the club, Mr. Isaac Gould. On the minutes of the previous quarterly meeting coming up for approval, the secretary (Mr. G. F. Wilkinson) drew attention to certain alterations in the rules affecting the constitution of the committee, and these were confirmed. The report and balance-sheet were then read by the secretary. The former detailed the successive steps by which the Builders' Exchange became a permanent institution, and blossomed into a social club, and then went on to describe the work it had done in connection with the Leeds Consolidation Bill on points which were considered detrimental to the interests of the building fraternity. Especial prominence was given to the proposed clause prohibiting the building of back-to-back houses, and in this connection it was stated that the committee visited Hull at their own cost, in consequence of the laudation of the through houses for the working classes there, but that their careful inspection of these resulted in a conviction that the system prevailing in Leeds was in every way superior to the houses they saw in Hull. So far as the club was concerned, and in the promotion of which the executive freely acknowledged their indebtedness to the generous support given by the firms dealing in building materials, the report showed that it had been a financial success, a dividend of 7½ per cent. upon the paid-up capital having been declared for the past year. Premises had been secured in a most central and convenient position in the city, and these were opened on August 1 last by the mayor, Alderman Ward, whose services on the occasion had been recognised by conferring upon him the honorary membership of the club. The financial statement showed a credit balance on the past year's working of 76*l.* 2*s.* 4½*d.*, and a total surplus of assets over liabilities of 91*l.* 19*s.* 0½*d.* The report and balance-sheet were received with warm approval, and on the motion of Mr. Finney, seconded by Mr. Ezra Stead, they were unanimously approved. The meeting next proceeded to the election of office-bearers, when the president (Mr. Isaac Gould), the vice-presidents (Messrs. Councillor Hannam, B. North and J. Matthews), the hon. secretary (Mr. G. F. Wilkinson), the auditor (Mr. F. A. Holdsworth) and the solicitor (Mr. Walter Foster) were re-elected. Mr. J. Langton was elected hon. treasurer in place of Mr.

Edward Walker, who wished to retire, and the following gentlemen were chosen to form the committee:—Messrs. Kendall, Wood, Edward Walker, J. T. Wright, Denby, Mountain, Bower, Burnell, Blunt, Preston, Carlton, Stead, Walsh, Knapton, Beaumont, Fawcett, S. Atkinson, Frankland, Cluderay and John Walker. This concluded the purely formal business of the meeting, and the members afterwards indulged in a discussion on the various questions affecting the interests of the building trade.

PATENTS FOR INVENTIONS.

A PAPER was read at the meeting of the Civil and Mechanical Engineers' Society by Mr. E. H. G. Brewster, A.M.I.C.E., chartered patent agent, on "Patents for Inventions." The paper gave a sketch of the origin of these patents and a general history of the subject down to the present time. The author then devoted his attention to the subjects of examination for novelty before a patent is granted, and the policy of reducing or not the fees paid by inventors. With regard to the first of these the writer was not in favour of such examination, for although at first sight it did not appear just and equitable for a Government to grant a patent that might be worthless from want of novelty, it was shown that it was impossible for an examiner to be quite sure of an invention being new, for it might easily happen that a manufacturing process, for instance, was being used that he, the examiner, knew nothing of, and a patent be granted for it to a new inventor, or for him to refuse a patent for a valuable invention that might have the appearance of an old one, which old invention had been a failure when tried, while the former was a success. The American system of examination was alluded to, and it was shown that the American people themselves were not, to say the least, particularly in favour of it. The examination as to novelty by the German Patent Office was stated to be more unsatisfactory than the American. The question as to fees was then gone into, and after mentioning the opinion expressed inferentially by the Society of Arts by their Bill of 1882 for the improvement of the Patent Law, which was brought in the year prior to the great Government measure, the author said that it appeared to be to him, as a matter of public policy, advisable not to lower the present cost of a patent, for already a vast deal of rubbish was patented, and it was practically impossible to exclude this by any amount of examination without at the same time killing many valuable inventions, and further, that some of this rubbish might be very hurtful

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SANITARY CONDITION OF THE "BAR LIBRARY," DUBLIN.

THE following report on the condition of the Bar Library, Four Courts, has been prepared by Mr. Thomas Drew, R.H.A.:—
22 Clare Street, Dublin.

It is to be clearly understood that this report does not attempt to recommend an efficient system of ventilation of the library. That is impracticable in its present excessively overcrowded use and wholly inadequate cubic space. The building would require to be at least double its present capacity to provide the minimum that is generally recognised to be consistent with ordinary sanitary conditions.

For an ordinary factory or workshop regulated under statute the conditions issued by H.M. Chief Inspector of Factories and Workshops at Whitehall (appended hereto) lay down that "there must be 250 cubic feet of space for every person employed in a room; when work is carried on after 8 P.M. (with artificial light) there must be 400 cubic feet for each person."

It seems scarcely credible—but it is true—that the Bar of Ireland constantly work under specially unwholesome conditions, with much gaslight, with 190 feet of cubic space for each person, and an allowance of floor equal to 8 1-3 superficial feet.

My attention has, for the present, been directed to an examination whether the system of ventilation, as it is, is any worse than it need be. It is, in my opinion, not only much worse but dangerous to health.

The present limited intake of air is by Tobin tubes in the library, which are supposed to draw their supply of air from a large tube carried up from the basement, the current of which is supposed to be accelerated or otherwise affected by what has been known as an "Æolus waterspray system." Theoretically this system would be effective if, in the first place, the apparatus were perfect, and, in the second, the source of air supply were pure and untainted. Neither of these conditions exist.

The basement vaults under and the sunk areas adjoining

the Four Courts Buildings are at best but fetid and stagnant places. They are traversed by many drains, having various manholes and ventilators. The drains are sluggish or with no fall, close to the surface, and on them the ebbing and flowing tide of the Liffey must act with alternate suction and pressure.

It is from one of these stagnant areas, and in which there is one manhole ventilator, that the main intake of air is supposed to be entirely drawn.

But the conditions are even worse than this. In the sheet-iron tube conveying the air supply there are probably 80 to 100 joints, and few of them are close. It is plain demonstration that there is a strong suction of basement air laid on to the library.

A smoke test applied in the basement on December 28 last had such results that I withdraw recommendations which I made in a preliminary report of December 20. It was found that the whole of the library and the Rolls Court was permeated by the smoke in half an hour after the test was applied. Accordingly, I have limited the operations entrusted to me during this recess to abandoning the area intake entirely and the Æolus air-spray tube, and to take in an air supply from the upper part of the windows of the lower hall. This is connected with the Tobin tubes and gives at least as fresh air as it is possible to take in on the north side of the Four Courts.

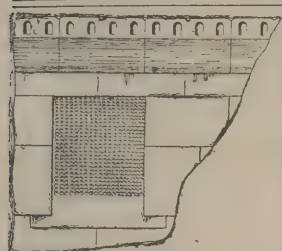
The w.c.'s and urinals about the library are unfortunately placed; they seem to be carefully and well fitted, but their ventilation is defective. Some, immediately under the library floor, in connection with the judges' private rooms, have no external ventilation whatever. The library w.c.'s are but top-ventilated, and the higher temperature of the library draws a current of air from them. The attendants' w.c. is also unventilated.

It would not be easily practicable to sever all connection with the basement while the heating pipes from the furnace below are passed up.

The heating coils in the library, which can heat only impure air, appear to me as objectionable as they are unnecessary. The fireplaces, with the overcrowding, are sufficient to keep up a high temperature in rooms the whole cubic content of which does not amount to 60,000 cubic feet.

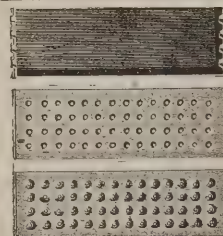
I should recommend the removal of the coil cases and pipes, and reliance on the more wholesome action of the open fires. Further expenditure on trying to improve the ventilation would be thrown away under present circumstances.

With an enlargement of the library to a fairly sufficient size



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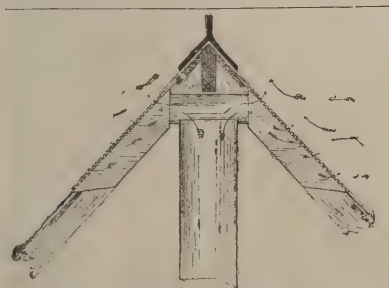
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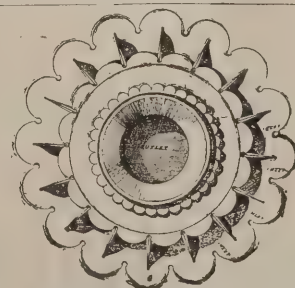


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only could a healthy and efficient system of ventilation be possible. Its leading principle should be the in-taking of air at some high and untainted level, the distribution of it in cold weather by an active hot-air system of warming (not by hot-water pipes), and the impelling of a current at that time and other times by mechanical power, which is applicable.

SAFETY FROM BOILER EXPLOSIONS.

IN turning over the pages of the catalogue of the Eagle Range & Foundry Co., we find illustrations of the "Eagle Safety Bell for the prevention of explosions in boilers." At the beginning of this month the frost set in with scarce any warning, with an intensity that was almost unprecedented. On other occasions the progress towards intense frost has been generally more graduated. Numerous disastrous casualties and fatal accidents resulted from the many boiler explosions that took place. Public attention has, therefore, been once again directed to the terrible dangers they are content to risk in their own homes. During the last week or so, naturally, there has been much discussion on the part of the public as to how to put their houses in order and do all that is possible to secure entire prevention of boiler explosions. We are sorry, however, to add that such explosions have occurred and can occur without the agency of frost. It is not necessary to describe the many and various ways in which frost causes an explosion. What is to the purpose, however, is to insist on the necessity of a safety outlet, having which there will be no means for steam to bottle itself up to find its own outlet through an explosion. The term "safety valve" is somewhat of a misnomer. They may or may not do good service at times, but as safety appliances no expert could say they are reliable. Theoretically it could be demonstrated that they are a perfect means of securing immunity from boiler explosions; but practically this is too frequently not the case, especially in houses where the ramifications of the hot-water supply are so complex, instead of being arranged on a simpler design, which after all would do duty better all over the house. The Eagle safety bell is a patent of the Eagle Range and Foundry Company. This safety apparatus consists of a gun-metal plug (which can be easily fixed to any boiler) containing a fusible ball. This ball melts at a temperature very much below the bursting point of the boiler, and relieves the pressure at once; it also causes a jet of water to pour direct on to the fire, thus extinguishing it and removing all possibility of further danger.

The fixing is most simple. A hole is drilled in the top of the boiler, and the plug screwed through until it projects inside the boiler about $\frac{1}{4}$ inch; the bell is then screwed up tightly from inside the boiler. When the boiler is filled with water the air becomes pressed up into the bell and compressed more and more, until at a very high pressure from 1 inch to $1\frac{1}{2}$ inch of compressed air is confined between the top of the water and the fusible ball. This strata of compressed air effectually prevents the water coming in contact with the ball, consequently furring or incrustation is entirely prevented. Where the boiler is made without any manhole, the bell is made in one piece, so that it can be screwed through a $\frac{3}{4}$ -inch hole. It is imperative that to secure safety persons must have a reliable safety appliance. One further matter should have attention called to it, viz. that steam pressure can be generated with terrible rapidity under certain conditions, not only in winter, but in summer, as has happened before now, ruin and destruction following without the slightest warning. No better advice can be given than to say that all encouragement should be given to those who do their best to cater for the public safety. The catalogue of sixty pages (illustrated) should also be consulted in regard to specialties of the Company and their well-known ranges, space not permitting to refer to them further. Several pages of extracts from testimonials received from all quarters form a valuable expression of public opinion as to the worth and merit of the appliances.

CITY IMPROVEMENTS.

At the meeting of the City Commissioners of Sewers on Tuesday Mr. Bridgman, the chairman, reviewed the events of the Commission during the year, which, he said, had been one of stern and endless hard work. The body was first constituted the sanitary authority of the City immediately after the Great Fire of 1666. The City, without exception, was the best cleansed and the best paved and the healthiest place in the world. During the past year a widening of Upper Thames Street had been decided upon. A plan to widen the western end of Cheapside, at a cost of 100,000*l.*, was awaiting the decision of the London County Council as to a share of the expense. The approaches to the Tower Bridge were in abeyance for a similar cause. During the last forty-two years the Commission had expended in improvements 4,254,423*l.*, of which the Corporation and the Metropolitan Board of Works

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contributed 1,270,789 $\frac{1}{2}$. The artisans' dwellings in Petticoat Square were all filled, the inhabitants exceeding in number 1,000 persons. The cost of clearing the site of the buildings had been 200,915 $\frac{1}{2}$. The rents during the year were 5,466 $\frac{1}{2}$., and the expenses 1,288 $\frac{1}{2}$. There were now 479 electric arc lamps used in the City, costing 26 $\frac{1}{2}$ each, or 12,454 $\frac{1}{2}$ per annum. Experiments had been made in Aldermanbury and Basinghall Street with incandescent glow lamps, with a view to determine the most desirable method of lighting from the centre of the streets, and had also been made in Lower Thames Street. In testimony of the satisfactory progress of electricity in the City, nothing could, the Chairman thought, be more eloquent than the recent decision of the Commissioners to remove the old gas lamps at an early date from the main thoroughfares, which had been maintained at an annual cost of about 1,182 $\frac{1}{2}$ ready for lighting in case of electrical failures. The necessary steps had been taken from time to time by the Commissioners, under the dangerous structure clauses of the Building Act to insure the safety of the public, and only just recently the old wooden structure known as Moorgate Street Station was condemned, but not a moment too soon, and would have to be entirely reconstructed.

REGISTRATION OF PLUMBERS.

A MEETING of the plumbing trade in Ayr and the district has just been held in the Ayr Town Buildings, in furtherance of the movement for the national training, examination and registration of plumbers and with special reference to the proposed plumbing classes at Ayr. The meeting was a large and representative one, and a deputation from the Glasgow and West of Scotland District Council was present. The deputation consisted of Messrs. Archibald Craig, writer, Glasgow, hon. sec. to the District Council; Wm. Anderson, president of the Master Plumbers' Association of Glasgow; Jas. Hogarth, master plumber of Ardrossan; M. Riva, operative plumber of Glasgow. Mr. Cowan, master plumber, was called to the chair.

Mr. Craig intimated that he had received a letter from Mr. C. G. Shaw, county clerk, stating that the County Council had resolved to devote the sum of 100 $\frac{1}{2}$ towards the promotion of classes for plumbers in the county of Ayr. Mr. Craig stated that the District Council which the deputation represented embraced the western counties of Scotland, including Ayrshire,

and consisted of forty-two members—fourteen master plumbers, fourteen operative plumbers and fourteen public representatives. Touching on the educational side of the movement, Mr. Craig dealt with the work done in Glasgow and Greenock, from which it appeared that the classes there were of great value. The County Council of Ayrshire had asked the District Council to submit a scheme, and the District Council had naturally come to the conclusion that the proper place to start operations would be in the town of Ayr. It would be for the meeting to say how they should spend the money. He thought a representative committee should be appointed to make arrangements regarding the classes. The committee could co-operate with the District Council and the classes should be started this winter.

After full discussion a committee was appointed, Mr. Cowan being elected chairman, and it was determined to endeavour to start the classes at once.

The Court of the Company of Plumbers having considered the necessity which exists for the provision of additional facilities for the systematic instruction of teachers of plumbing classes and foremen and inspectors of plumbing-work in the subjects of sanitation, and in such branches of science and practice as are embraced in the proper construction and adjustment of sanitary appliances, have made arrangements with the Council of King's College, London, for special classes of advanced instruction in these subjects. The students to be admitted will be selected by the Company from those who have regularly attended any one of the metropolitan plumbing classes and have passed the City and Guilds of London Institutes' examinations in the theory and practice of plumbing, first class in the honours grade.

Each course will last twelve weeks, and certificates of merit will be given to those who have attended regularly and passed a satisfactory examination. Lectures in each course will be given upon physics, chemistry and sanitation in relation to plumbers' work, and Mr. Geo. Taylor, R.P.C., will teach advanced practical plumbing in the plumbers' workshops at King's College, which have been equipped, under the direction of Mr. S. S. Hellyer, by the Plumbers' Company.

A museum is attached to the workshops, in which specimens of work and apparatus, sanitary appliances, &c., will be shown.

Candidates for admission to the above classes must apply to the Clerk, the Worshipful Company of Plumbers, 1 Adelaide Buildings, London Bridge, giving full particulars of the instruction they have received and of any examinations they have already passed.

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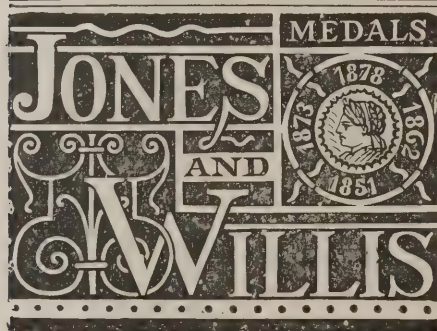
CHRIST'S HOSPITAL.

A MEETING of the City Commission of Sewers was held at Guildhall, when Mr. H. H. Bridgman, presided. A deputation, representing the Council of Almoners of Christ's Hospital, and headed by Mr. Alderman Vaughan Morgan, the treasurer, attended to present a memorial relative to the notice in respect of the drainage of that institution. The memorial stated that in consequence of an outbreak of scarlet fever at Christ's Hospital last October, and in accordance with the advice of the medical officer of health for the City of London (Dr. Sidgwick Saunders), the boys of the foundation were sent to their homes, to the great inconvenience and expense of the parents and guardians and the serious educational loss of the boys. The medical officer of health subsequently made a searching investigation into the sanitary condition of the hospital, and reported that nothing short of an entire reconstruction of the general system of drainage would suffice to bring the school into focus with modern requirements, and make it fit for wholesome occupation. His report was adopted by the Commission, and a notice under the Public Health Act, 1891, was served upon the governors requiring them within three months from December 5, 1893, to execute such works and do such things as might be necessary to abate the nuisance complained of. The Council were informed that the work would involve an outlay of from 15,000*l.* to 20,000*l.*—an expenditure which they would not be justified in incurring, as the school would as soon as possible be removed to premises which had been acquired in the country. Moreover, the work would take considerably more than three months to carry out. They had made various inquiries, and had tried to obtain premises in which the work of the school could be carried on temporarily, but they had failed to find suitable accommodation, and in consequence the school was unable to reassemble, and further hardship to both parents and boys would follow. The council believed the health of the children would be better in Newgate Street than in temporary premises. In support of that opinion they referred to the testimony of Dr. Andrew (their physician since 1879), Sir William Savory (their surgeon since 1871), the health report of the school (which would be found to compare favourably with that of any other school of like size in the world), and to the fact that during the last twenty-four years there had been but twelve deaths among the

boys at the school, only one of which—occurring in November 1890—could be attributed to the hospital drainage, and that was when a drain was opened in special circumstances. In seven of the twenty-two recent cases of scarlet fever the illness was not contracted at Christ's Hospital, and in six of the others the patients were the staff and not the boys. In only one of the whole twenty-two was the cause attributable to the drainage. None of the cases presented dangerous symptoms or any suggesting defective sanitation. In these circumstances, and in view of the insuperable difficulties experienced by the governors in finding suitable accommodation elsewhere, the Council of Almoners hoped the Court would withdraw the notice served upon the governors, in order that the hospital's site in Newgate Street might be used until the new boarding-schools were erected. They presented, too, a report of proposed alterations in the drainage which, in their opinion, would render Christ's Hospital fit for occupation.

Mr. Alderman Vaughan Morgan said that the Duke of Cambridge, the president of Christ's Hospital, had intended to have been present to head the deputation, but had been called abroad. He hardly thought that had the whole facts been known the Commissioners would have pronounced the cruel decree of banishment against the school. The governors sent the whole of the boys home, and in many cases to very poor homes, and there they had remained since October, greatly to their detriment in every way. The buildings of Christ's Hospital in Newgate Street could only be used for a short time as, under the scheme of the Charity Commissioners, the whole school was about to be sent into the country, and it was therefore impossible, as well as wasteful, to ask the governors to spend 20,000*l.* to patch up these existing premises for a few months or years, knowing that at the end of that time they would be devoted to some other use, and probably to a use where drainage in a residential sense was unnecessary. They had gone everywhere to obtain a temporary school, but wherever they went the sanitary conditions were infinitely worse than at Christ's Hospital. He hoped that the Commissioners would sanction the modified plans, so that the school might return for a time to their old building pending their final removal to Horsham. As a boy himself at Christ's Hospital, and as a resident for the last few years as treasurer, he could say that the Newgate Street school was one of the healthiest places in the world.

The memorial was referred to the Sanitary Committee for consideration and report forthwith.



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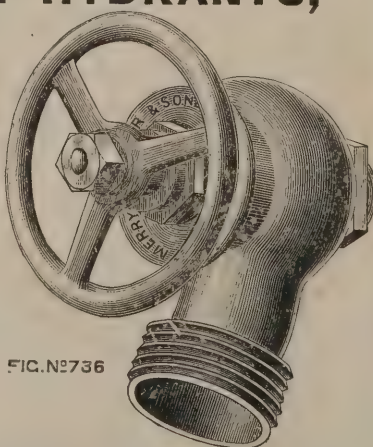
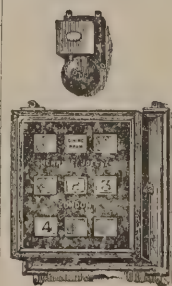


FIG. N° 736



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USES OF ELECTRIC FORCE.

AT the meeting of the Manchester Literary and Philosophical Society, at the Society's house, 36 George Street, Professor Schuster in the chair, Mr. Henry Wilde, F.R.S., gave a brief history of the dynamo-electric machine, and an account of his discoveries, which have had so important an influence in making possible the commercial supply of electric light and power on a large scale by the Corporation of the city of Manchester. He also gave experimental illustrations by means of the installation which he has presented to the Society of the uses to which the supply may be put in philosophical research. Of the many scientific uses and manifestations of the electric force Mr. Wilde enumerated the following:—(1) The arc and incandescent light, (2) heating wires and inferior conducting substances, (3) energising induction coils and producing electric oscillations, (4) the excitation of powerful electric magnets, (5) the action of magnetism on gases, (6) diamagnetic polarity and magnecrystalline action, (7) reproducing the phenomena of terrestrial magnetism, (8) demonstrations in spectrum analysis, (9) conversion of electricity into mechanical work, (10) electrolysis of chemical compounds, (11) reduction of refractory substances in the electric furnace, (12) the artificial formation of minerals, (13) demonstrations in biology and physiology, and (14) lantern projection for microscopic and other objects.

THE BIRMINGHAM TOWN HALL.

A NUMBER of the citizens of Birmingham interested in musical gatherings in the Town Hall have met the Estates Committee, for the purpose of discussing the general question of the Town Hall draughts and the best means of remedying the existing grievances. Councillor Jacobs presided, and explained the object of the meeting. The Estates Committee were anxious to please the public in every possible way. They had spent a large amount of money in improving the system of ventilation, and if the people who engaged the hall would only carry out the instructions properly there would, it was believed, be very little to complain about. Mr. J. A. Cossins, architect, had advised them all through as to what should be done, and he received assistance from the late Mr. Phipson, an authority on the ventilation of large buildings. Moreover, the curator of the hall was a man who thoroughly knew his duties in heating and ventilating the hall. The system adopted was very complete, and, with ordinary precautions, satisfactory. They had hot-water pipes, an engine which drove a large fan, and the latter

in its turn forced the hot air into every part of the hall. The temperature that afternoon was 60 degrees on the floor and 58 degrees near the ceiling. The gas jets in the windows were valuable adjuncts to the heating apparatus, for they killed the cold air that came from the twenty-eight or thirty windows into the hall. Double windows had been suggested, and they would be very useful in keeping out the draughts, but the cost of providing a set of stained-glass windows would be about 3,000/., a sum which the committee would not be warranted in spending. Those who gave concerts in the Town Hall had very few complaints to make about the draughts, but the complaints chiefly came from those who had the hall free. The Mayor lent the hall to charitable associations and musical associations, but on such occasions it was hardly fair the ratepayers should pay for the warming of the building. If the Mayor gave people the free use of the hall they certainly ought to pay for the lighting and heating. The heating only cost about 15s., and if those who had the hall chose to have the gases in the windows lighted the total cost would only be a sovereign. But the people who had the hall free would not pay the sovereign. If they would only pay a sovereign and allow the curator to warm the hall properly, then there would not be half the complaints about draughts. A great many of the complaints were imaginary, and some real. He was anxious that concert-givers and all who engaged the hall should let the door-keepers and the men generally be under the control of the curator, Mr. Bevis, who knew exactly what to do and how to do it. If those men were under the control of the curator, and obeyed him as to closing the doors and other matters, the audience would be comfortable. It was not the draught the general public complained of; what they suffered from was the cold caused by the people who engaged the hall being unwilling to spend a sovereign to have it warmed.

Mr. J. A. Cossins said the draughts would never be wholly avoided until the windows were glazed. He recommended double windows, but they would be very expensive to put in and expensive to keep clean. So far as the ventilation was concerned, the air was pure, whether it was warm or cold. He believed there would be very few complaints if people who engaged the hall left the warming and lighting in the hands of the curator.

Mr. Percy Harrison said that at his concerts his employes always kept the doors closed, and he had very few complaints of draughts. He did not consider there was any necessity for

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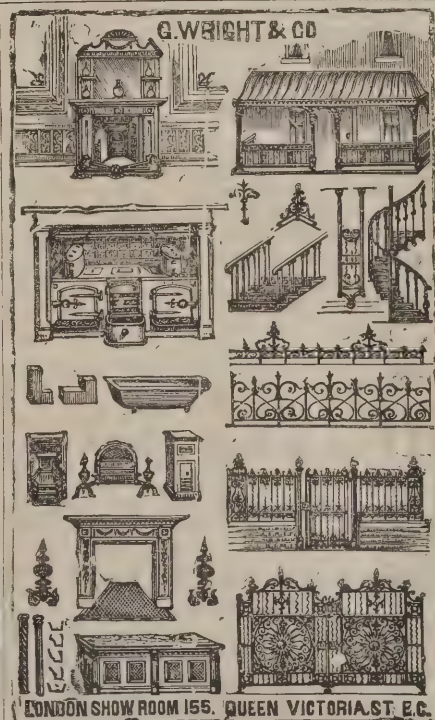
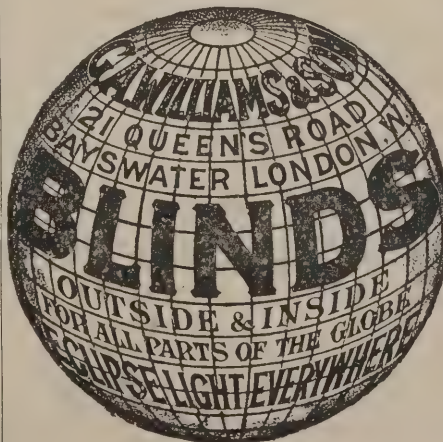
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a very large outlay in respect to the ventilation. There was quite sufficient air in the hall, and since the gas had been superseded by the electric light matters had improved. He should strongly advocate the double windows if the expense were not so great. He recommended that the gases in the windows should be continued all round the hall, believing that that would be an improvement.

Mr. Stockley said that if the arrangements of the hall were properly attended to there would be nothing the matter. He had been connected with concerts at the Town Hall for thirty-eight years, and he never once caught cold at a concert. There was a great draught in the orchestra, but if the hall at the back of the organ were warmed he thought the draught would be considerably reduced.

The company then inspected the hall. The heating apparatus was explained, and it was considered perfectly satisfactory for warming the building. It was not thought there would be any complaint in the galleries or on the floor if the doors were kept closed, but there was a strong draught in the orchestra even when the doors and windows were shut. Various suggestions were made, and there was a general opinion, shared by Mr. Cossins, that this draught was caused by the cold air in the organ. The air became cold by reason of the immense body of cold metal of which the organ was constructed, and it then descended from the instrument to the orchestra and made the occupants uncomfortable. This, it was thought, could be remedied without much difficulty, and Councillor Jacobs said the committee would be glad to have the matter attended to as soon as possible.

TECHNICAL EDUCATION AND IRONWORKING.

At the meeting on Saturday of the South Staffordshire Iron and Steel Works Managers, the president, Mr. James Roberts, delivered an address. In the course of it he considered technical education. In these days, he said, he would be a bold man who ventured to say that technical education was unnecessary to the highest form of success. It was not by any way the sole, or possibly the chief means, yet it was that portion of a modern education which enabled a man to do the best work when combined with the knowledge acquired by practice. There were various forms of technical education, such as that given by the science and art and evening classes, that had come into force by virtue of the Technical Education Act passed by the late Government. Whilst this in itself was

a step in the right direction, he was afraid that from the superficial way it was administered very little lasting good was done. Too much was attempted and too little really accomplished. It was almost an impossibility to teach a range of subjects such as metallurgy, light, heat, steam, acoustics, &c., by one man, who, at most, could only have a very superficial knowledge of all of them. Instead of multiplying these technical education schools until there was an efficient school attached to almost every Board school, it would be well to group districts together and form, under the best possible science masters, a really efficient school, where the young lad or the apprentice could attend in the evening and carry on the work without any restriction as to age so long as he made himself efficient. That they had such centres as Masons College at Birmingham, Sheffield Technical Schools and similar institutions at Liverpool, London and other places, was a great thing in itself, but it would be better for the ordinary artisan if these schools were to be supplemented in the manner he had indicated. Having recognised the advantage of a technical education, it was the duty and ought to be the pleasure, of every member of that Institute of Managers to do everything in their power to see that these efficient schools were founded, and then to use their persuasion with the parents of the children and the young men themselves, to urge them to attend and fit themselves for the more important duties of life. Many parents said, "Oh, I don't see what he wants to be taught about science for; I'm a practical man and have done fairly well, and why shouldn't he?" Because in these days they moved quickly, competition was keener, and the race was not with the strong, but the keenest intellect. For a man to have an intimate knowledge of the material upon which he was working, of its chemical composition, structure, and of the various effects of heat applied to it, would often be the means of not only saving himself a lot of what would otherwise be wasted energy, but also enable his master to make a small profit instead of a loss. The men in the future who would be selected as foremen, managers, &c., would be those who had studied both the technical and practical side. On the other hand, there was possibly a danger of making too much of technical education. The theory of science was perfectly true as it was stated, and when performed as a laboratory experiment, but when it came to the application of theory to manufacture then there were so many circumstances that operated against the perfect theory that a practical knowledge was necessary to duly weigh the case and get a good result, and a

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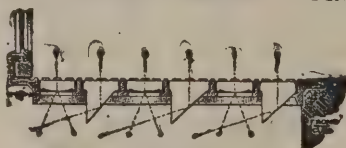
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far better result from the combination of the two than could be obtained from either of them taken singly. They prided themselves on being practical men, who could see the advantage of technical education and apply it when obtained. This subject had a far-reaching effect on the future. They must remember that Germany and France had both been far ahead of us in all matters of technical education, but until the last decade had not had the advantages of the practical side of the question. Now, however, they were fully up to English practice, and with the help of their scientific attainments would run them very hard, unless they bestirred themselves, and saw that the rising generation received the best technical and practical education it was possible to give them. Let their advance be side by side. They must not make the mistake of sending their sons to college until they were of age, but see that they did a certain amount of practical work in the shops, and attended the science classes at the same time. Let them have the advantage of learning the theory, and in their daily occupation apply it to practice. However little theory they might have learnt, the mere chances of testing it practically would be a strong inducement to them to go still deeper into the theories of science, and thus they would be led, as it were, almost insensibly, to assimilate the theoretical with the practical in such a way as would lead to the best results. It might, he thought, appear from the tone of his remarks that he was somewhat severe on the purely technical colleges. He fully admitted that they owed a very great deal to them, and to their labours was due much of what was known and practised in metallurgy. At the same time, there appeared to him to be a danger lest the youth of this country should imagine, because they were well up in all the subjects taught at those schools, that they ought to be able to manage works and men; and often, he was afraid, their parents were doomed to disappointment that they could not immediately earn large sums when they had these attainments. That they must have a certain number of men to devote their lives to concrete science, and that these schools were the fields where they would be produced was true; but what we, as a manufacturing nation, wanted was the man who had been brought up in works, plus any amount of theory and science that could be acquired at the same time. This, he believed, would lead to the most successful result, and he asked them to see that the means of acquiring this science was put in the way of every young man in the manner most like to achieve the purpose they had in view, namely, by the adoption of really good schools where each branch should be thoroughly taught,

instead of the multiplication of so-called science classes, which were essentially merely elementary, and as such almost a waste of the ratepayers' money.

BIRMINGHAM MEAT MARKET AND SLAUGHTER-HOUSES.

TWENTY-THREE Birmingham firms of architects have, the *Birmingham Daily Post* says, been invited by the Markets and Fairs Committee to send in competitive sketch plans for the new meat market and slaughter-houses. The designs have to be sent in to the town clerk by March 10, and three premiums are offered, namely, 100*l.*, 50*l.* and 25*l.* The adjudication will be made by the committee, with the assistance of Mr. J. Murgatroyd, F.R.I.B.A., of Manchester, who was the consulting architect in the case of the designs for the new Technical School. A plan of the site, lying between Bradford Street and Cheapside, has been furnished to the competitors, together with instructions, from which we quote the following particulars:—The committee estimated that the sum of 40,000*l.* should suffice for the total cost of the buildings, &c., such amount to include gas, water (hot and cold), ventilating, sewerage, gear and all permanent fittings (but excluding refrigeration and pumping machinery and electric installation), but each competitor must give his own estimate of the cost. A general description of the materials, methods of construction, paving, ventilation, &c., is to be sent in with the plans. It is suggested that the inside walls of the meat market should be faced with white glazed bricks to a height of at least 7 feet and of all slaughter-houses to a height of at least 8 feet. The buildings to be provided are:—(A) The meat market. This should be a building extending from Bradford Street to Cheapside, and should be about 90 feet wide, and lighted principally from the roof. Roadways and footways should be provided for according to the plan, with entrance to the stands from the roadways on the site. The glazing should be as far as possible vertically arranged and not on the slopes of the roof. Fittings and hanging gear to be provided according to the most modern system, such as the latest in use in Smithfield Market, London, and to be so arranged as to be capable of being worked in conjunction with the slaughter-house gearing. Provision should be made for the erection of offices for salesmen over the central stands in the market, if and when required. (B) Slaughter-

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houses for wholesale butchers, about twenty in number, as shown on plan, and measuring about 18 feet wide by about 20 feet deep. These should be separated from the market by a covered cart-roadway, well ventilated, about 21 feet wide, but all must be put in connection with the market by overhead travelling gear, such as in the Birkenhead Corporation slaughter-houses. In arranging for the gear in each slaughter-house, provision must be made to allow of two beasts being slaughtered at the same time. The slaughter-houses should not be separated by internal walls, but by strong iron bars or lattice-work. Small railed pens for placing cattle in previous to slaughter should be provided outside each slaughter-house. Arrangements to be so made that the animals may be brought into the slaughter-houses without being brought into the roadway on the market side. (C) Lairage for about five hundred sheep and two hundred beasts. This should be provided over the slaughter-houses, projected over the railed pens last mentioned, and should be in the form of one or more open halls, divided off into pens for sheep, tying-up spaces for the beasts, and approached by means of inclined ways from the yard at the rear of the slaughter-houses. (D) Slaughter-halls for retail, &c., butchers. These should be three in number, to cover not more than 2,000 yards of land, with accommodation provided above for storage of fodder, &c. (a) One for beasts, with all necessary overhead travelling gear for use in hoisting and dressing the carcasses. (b) One for calves and sheep. (c) One for pigs, with arrangements for hot and cold water vats, &c. Lairage for animals to be slaughtered in these halls to be provided for, which, if necessary, may be above portions of the slaughter-houses. (E) A department for the storage or collection of ropes, fat, hides and skins, and for blood separation (but not albumen manufacture); also for tripe dressing and boiling. It will be necessary for hot and cold water to be provided throughout the premises from elevated tanks. The two slaughtering departments may be connected by a subway if found necessary. (F) Cold stores. The storage chambers should be arranged as a basement to the meat market, with approaches by subways or inclines, and with several openings for hydraulic lifts into the upper market. The storage space should be in several distinct compartments, and so that they may be refrigerated either separately or together. From 250 to 300 square yards of space should be provided. (G) Engine and machinery department in basement. This should include the provision of a deep well, a boiler-house, an engine and dynamo-room, a small store-room

and repairing shop, a machine-room for the reception of the refrigeration tank and machinery. It is probable that the cold dry-air system of cooling the chambers will be adopted, but the design and arrangement of the machinery does not form part of the present competition. Provision is also required for a small mess-room adjoining the offices, for Corporation market employes, and a mess-room for slaughtermen, &c. Closets and lavatories to be provided, on different parts of the site, for the use of tenants of the market and their servants and persons attending the market. A room for the apparatus for destroying condemned meat.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 374. Fred. Flatman, for "A device for attachment to graduated inch rules, whereby more minute."
- 395. Samuel Hill and George Mackie, for "Improvements in fastenings or catches for windows and doors."
- 426. John George Aulsebrook Kitchen, for "Improvements in or relating to wire joints or connections."
- 463. Peter Kemp, for "Improvements in window-sashes."
- 465. Daird Aitken, for "Improvements in and relating to window-sashes."
- 486. Edward Thomas, for "An improved fire-escape."
- 503. Ray Gaul, for "Improvements in apparatus for producing a draught in smoke stacks and chimneys."
- 540. George Henry Hughes, for "A safety-plug for preventing explosions of hot-water boilers and hot-water apparatus."
- 542. Percy Stuart Green, for "The frozen-pipe-burst-preventer and rapid thawer."
- 637. Oscar August Berend, for "Improvements in air-valves."

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COMPETITIONS OPEN.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ABERTILLERY.—For Building Twelve Cottages and Completing Nine others. Messrs. Bishop & Pritchett, Architects, Regent's Circus, Swindon.

ANTRIM.—March 5.—For Building Lunatic Asylum at Holywell. Mr. J. Lanyon, Architect, Northern Bank Chambers, Royal Avenue, Belfast.

APPLEDORE, DEVON.—Feb. 6.—For the Erection of a Timber-framed Battery and Drill Shed for Royal Naval Reserve. Director of Works, Admiralty, 21 Craven Street, W.C.

BARKEREND.—Feb. 9.—For Building Residence and Stabling. Mr. James Ledingham, Architect, District Bank Chambers, Bradford.

BLACKPOOL.—Feb. 3.—For Making and Fixing Shop Fronts, Windows, Doors, &c., in Walnut, for Shops in St. John's Market. Mr. J. Wolstenholme, Town Hall, Blackpool.

BRADFORD.—Feb. 6.—For Building Seven Terrace Houses. Mr. J. W. C. Atkinson, Architect, 1 Ivegate, Bradford.

BRADFORD.—Feb. 10.—For Building Two Wool Warehouses. Messrs. Brayshaw & Dixon, Architects, Bowling Old Lane, Bradford.

BRENTWOOD.—Feb. 7.—For Lavatory Works at Union Schools. Mr. J. Owen Perry, Clerk to the Hackney Union, Homerton.

BRIGEND.—Feb. 9.—For Building Vicarage, Ogmore Vale. Messrs. Halliday & Anderson, Architects, 13 Duke Street, Cardiff.

BURSLEM.—Feb. 21.—Additions and Alterations at Chell Workhouse. Messrs. Ford & Slater and Mr. Walley, Joint Architects, Burslem.

CARDIFF.—Feb. 10.—For Building Male Nurses' Rooms at Workhouse. Mr. E. Seward, Architect, Queen's Chambers, Cardiff.

CHALTON.—Feb. 5.—For Building School and Teacher's House. Mr. C. Crichton S. Benning, Clerk to the Taddington School, Dunstable.

CRADLEY.—Feb. 9.—For Building Police Station, Cells, &c. Mr. Henry Rowe, County Surveyor, Worcester.

CROSSGAR.—Feb. 9.—For Additions to House. Mr. Robert Watt, Architect, 77A Victoria Street, Belfast.

CWMTILLERY.—Feb. 7.—For Building Reading Room. Mr. E. H. Thomas, Lake Villas, Cwmtillery, Mon.

CYMMER.—Feb. 14.—For Building Baptist Chapel. Mr. H. Abraham, Porth, Pontypridd.

DEWSBURY.—Feb. 9.—For Building Two Semi-detached Houses. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

DURHAM.—Feb. 5.—For Extension of Sunday Schools, New Vestries, &c. Messrs. Davidson & Bendle, Architects, Newcastle-on-Tyne.

DURHAM.—Feb. 7.—For Alterations to Marquis of Granby Inn, Framwellgate Moor. Mr. George Ord, Architect, 16 The Avenue, Durham.

EARLS BARTON.—For Building Pair of Cottages. Mr. Edward Sharman, Architect, Croyland Abbey, Wellingborough.

ERITH.—Feb. 12.—For Building Cemetery Chapels, House, &c. Mr. F. Parish, Clerk to the Local Board, High Street, Erith, Kent.

FAREHAM.—Feb. 26.—For Building Block for Fifty Children at County Lunatic Asylum. Mr. B. S. Jacobs, Architect, Lincoln's Inn Buildings, Hull, and 88 Bishopgate Street, E.C.

GREENFIELD.—Feb. 14.—For Building House near Reservoir. Messrs. John Eaton & Sons, Architects, Stamford Street, Ashton-under-Lyne.

HALIFAX.—Feb. 7.—For Building Manufacturing Premises. Messrs. Utley & Gray, Architects, 10 Waterhouse Street, Halifax.

HALIFAX.—Feb. 10.—For Additions to Higher Grade Board School and other Works. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

ISLINGTON.—Feb. 6.—For Laying-in 559 Feet Glazed Socketed Drain Pipes and the Construction of a Tank and Filter Beds. Mr. G. W. Woodrow, Burial Board Offices, Vestry Hall, Islington.

KENDAL.—Feb. 10.—For Building Mission Room. Mr. Stephen Shaw, Architect, Kendal.

LEEDS.—Feb. 8.—For Pulling Down and Rebuilding Old Punchbowl Inn, Beeston. Mr. C. H. Thornton, Architect, Commercial Buildings, Park Row, Leeds.

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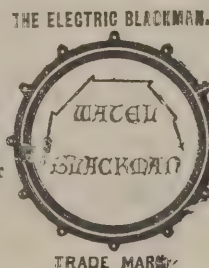
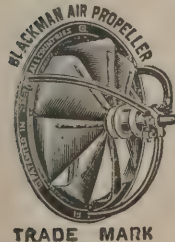
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LEEDS.—Feb. 12.—For Extension of Electric Lighting Station. Messrs. Milnes & France, Architects, Bradford.

LEEDS.—Feb. 19.—For Building Public Baths. Mr. Walter Hanstock, Architect, Branch Road, Batley.

Llandudno.—Feb. 5.—For Bench of Retorts. Mr. E. P. Stephenson, Engineer to the Improvement Commissioners, Llandudno.

MALDON.—Feb. 9.—For Building Villa. Mr. P. M. Beaumont, Architect, Maldon.

MANGOTSFIELD.—Feb. 6.—For the Construction of Main Outfall and Branch Sewers, Precipitation Tanks and Filter Beds, Erection of Sludge Pressing Buildings, Chemical Stores and Erection of Sludge-pressing Plant and Mixing Machinery. Mr. S. F. Andrews, Keynsham Union, Keynsham.

MOSS SIDE.—Feb. 12.—For Building Board School, House and Board Offices. Messrs. Potts, Son & Pickup, Architects, 34 Victoria Buildings, Victoria Street, Manchester.

NORFOLK.—Feb. 3.—For the Supply of Broken Granite for One Year from March 31. Mr. T. H. B. Heslop, C.E., County Surveyor, Norwich.

NORTHOWRAM.—Feb. 13.—For Building Board School for Infants at Ambler Thorn. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

PENYRHROEL.—Feb. 12.—For Building Eighty Houses. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

ROTHERHAM.—Feb. 8.—For Erection of Municipal Buildings, Police Offices, &c. Mr. R. J. Lovell, Architect, 46 Queen Victoria Street, E.C.

RYDE.—Feb. 10.—For Enlarging Pierhead, Erecting Pavilion, &c. Mr. R. St. George Moore, Engineer, 17 Victoria Street, Westminster.

SALFORD.—Feb. 5.—For the Erection of a Higher Grade School in Victor Street. Mr. Ogilvie Duthie, School Board Offices, Salford.

STAFFORD.—Feb. 15.—For Works at County Asylum. Mr. W. H. Cheadle, County Surveyor, Stafford.

WAKEFIELD.—Feb. 7.—For Extension of County Offices. Mr. Dixon, Clerk, West Riding Offices, Wakefield.

WESTON-SUPER-MARE.—Feb. 7.—For additions to Baths. Messrs. Price & Wooler, Architects, Waterloo Street, Weston-super-Mare.

WORKSOP.—Feb. 7.—For Building School. Messrs. Flockton & Gibb, Architects, 15 St. James Row, Sheffield.

TENDERS.

ARDNAMURCHAN.

For Construction of a Pier of Concrete, Walling and Timber at Mingary Bay, Ardnamurchan, for the County Council of Argyll. Mr. G. WOULFE BRENNAN, Engineer, Albany Street, Oban.

Law & Son, Edinburgh	£2,125	14	1
C. E. Kidd, Loftus, Yorkshire	1,911	18	9
A. McLean, Castlebay, Barra	1,883	9	7
Adams & Sons, Glasgow	1,659	0	0
T. McRoe, Glasgow	1,658	1	5
R. McKenzie, Dalibrog, South Uist	1,566	11	11
J. Bain, Ayr	1,514	3	0

BEDFORD.

For Further Works of Sewering and Roadmaking in the Queen's Park Building Estate, for Mr. D. C. Preston. Mr. RICHARD LUND, Surveyor, 8 St. Paul's Square, Bedford.

JESSE JACKSON, Leyton (*accepted*) £710 0 0

BRIGHTON.

For Alterations and Additions, with Two New Shop Fronts, at 4 London Road, Brighton. Mr. CHAS. NYE, Architect, 34 Duke Street, Brighton.

H. G. FISHER, King's Cross (*accepted*).

BURLEY-IN-WHARFEDALE.

For Building Three Brick Villas, Burley-in-Wharfedale, for Mr. John Naylor. Mr. A. MARSHALL, Architect, Otley.

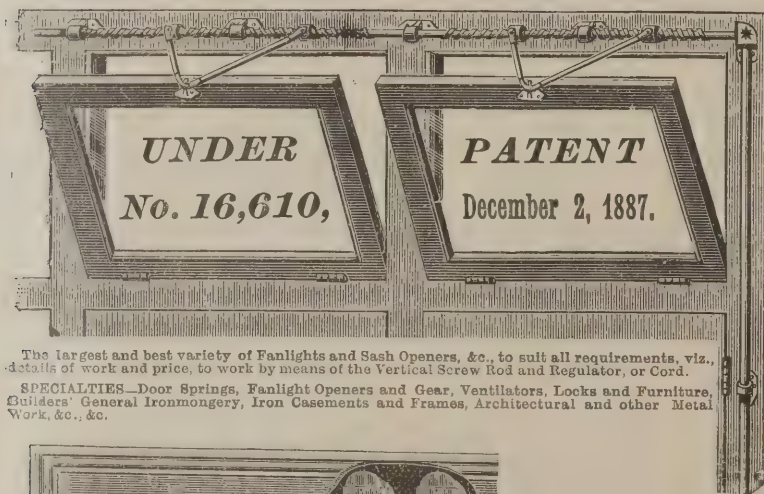
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A. Firth, Yeaton, plasterer	135	10	0
Thornton Bros., Bradford, slater	102	0	0
W. Thackery, Burley-in-Wharfedale, painter	20	18	0

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J. W. Deaves, Nayland	362	0	0
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N. GAFFNEY, Killmallock, co. Limerick (accepted) £570 0 0

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For Supplying and Fixing Mahogany Panelling and Electric-light Fittings in Offices, The Exchange, Liverpool, for Mr. Clay Medwood & Co. Mr. T. CLARKE, Architect.
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E. Parry	265	0	0
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Ballard	1,476	16	0
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Langham	1,376	0	0
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Hocking	1,345	0	0
Beech	1,287	0	0
Stevens Bros.	1,275	0	0
PEEK (accepted)	1,257	0	0

MANSFIELD.

For Sinking Well on the Mansfield and Southwell Turnpike Road, for the Corporation of Mansfield. Mr. GEORGE HODSON, Engineer, Loughborough.

Radcliffe & Co., Huddersfield	£13,814	0	0
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J. Tomlinson, Derby	7,394	0	0
Timmins & Sons, Runcorn	7,245	0	0
H. Vickers, Nottingham	6,900	0	0
T. Shardlow, Nottingham	6,576	0	0
J. F. PRICE, Nottingham (accepted)	5,275	0	0

MIDDLESBROUGH.

For Erection of New Warehouse, for the Owners of the Middlesbrough Estate, Limited. Messrs. WEATHERILL & WHIPHAM, Architects, Stockton-on-Tees. Quantities by Architects.

J. Johnson, Middlesbrough	£2,011	13	0
A. J. Cooke, Stockton	1,973	12	8
T. D. RIDLEY, Middlesbrough (accepted)	1,900	0	0

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PONTYPRIDD.

For Construction of a Brick Gas-holder Tank, 102 feet in diameter and 24 feet deep, for the Pontypridd Local Board.

Williams & James, Pontypridd	£5,826	7	9
J. Linton & Co., Newport, Mon.	5,821	15	6
W. Jenkins, Cilfynydd	5,642	4	9
J. Moores, Macclesfield	5,200	12	10
Aberfeld & Co., Penarth	5,133	0	0
Lloyd & Powell, Pontypridd	4,838	9	0
C. Jenkins & Son, Porth	4,640	0	0
J. Allan, Cardiff	4,528	8	2
Pauling & Elliott, Westminster	4,350	0	0
Evans & Jones, Cardiff	4,200	0	0
Batchelor & Snowden, Cardiff	4,154	16	4
T. J. Davies, Pontcanna	4,100	0	0
H. M. Nowell, Leeds	3,600	0	0
W. Lissaman, jun., Chipping Campden	3,440	0	0
T. D. RIDLEY, Cardiff (accepted)	3,261	14	11

WALTHAMSTOW.

For the Erection of Public Library Buildings, at High Street, Walthamstow, for the Local Board. Mr. J. WILLIAMS-DUNFORD, M.S.A., F.I.Inst., Architect, 100c Queen Victoria Street, London, E.C.

Castle & Son, Southwark	£3,155	0	0
W. Watson, Ilford	3,143	0	0
Barrett & Power, Hackney	2,939	0	0
L. H. Lipscomb, Walthamstow	2,896	13	0
J. A. Reed, Walthamstow	2,879	0	0
A. Morgan, Deptford	2,694	0	0
A. G. Barton, Walthamstow	2,680	0	0
Kerridge & Shaw, Cambridge	2,632	0	0
S. J. Scott, Walthamstow	2,587	0	0
Martin & Co., Croydon	2,512	0	0
J. Holland, Leytonstone	2,460	0	0
F. J. Coxhead, Laytonstone	2,373	0	0
S. Hipwell, Wisbech	2,300	0	0
J. W. BEST, Walthamstow (accepted)	2,349	16	8
Architect's estimate	2,405	0	0

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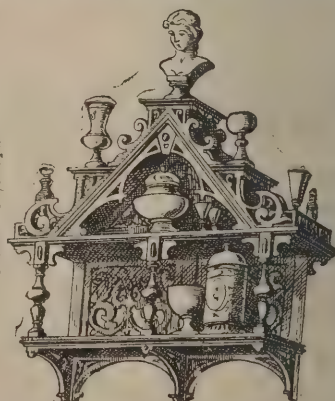
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SWINDON.

For Building Primitive Methodist Sunday School, Regent Street, Swindon. Messrs. THOMAS HOWDELL & SON, Architects, 24 Albion Street, Leeds. Quantities not supplied.

W. Chambers, Swindon	£2,996	10	0
J. Barrett, Swindon	2,275	10	0
C. Williams, Swindon	2,217	10	0
G. Wiltshire, Swindon	2,175	0	0
T. Colbourne, Swindon	1,840	0	0
R. J. LEIGHFIELD, Swindon (accepted)	1,821	15	0

VARIETIES.

IN acknowledgment of the public services rendered the town of Llandudno by Dr. James Nichols, he has been presented with an address and a purse of 500 guineas. He has announced his intention of presenting the money towards the fund for enlarging the cottage hospital, which is named after his wife.

THE *City Press* says:—What is described, probably not without good reason, as the finest goods station in London, is just being completed at Farringdon Street by the Great Northern Railway. The site is the square plot of ground facing the entrance to the Metropolitan Station at Farringdon Street, and bounded by Charles Street on the north, Farringdon Road on the west, the new Fruit and Vegetable Market on the south, and the Metropolitan Railway on the east. The works have up to the present been carried on almost entirely underground, and the amount of excavation which has been entailed may be described as enormous. In order to make connection with the existing Farringdon Street depôt, which stands alongside the passenger station, a bridge consisting of steel girders and stanchions had to be constructed underneath Charles Street (which is the name of the little cross street in which Farringdon Street Station stands). So far as the excavation is concerned, the work is now complete. The whole of the buildings are to be lighted by electric light.

At the Free Public Library and Museum, Bootle, the principal librarian, Mr. J. J. Ogle, delivered a lecture on "Insects destructive to Trees and Timber." Mr. Ogle gave an interesting sketch of the growth of trees and the formation of wood, and spoke at length on "insect life," and the changes

which they undergo from the egg through the grub state into the perfect insect. The destruction of the wood by these insects, he said, was generally begun whilst the trees were still growing, but it was by no means confined to that period, for once some of these insects attacked a living tree they continued to develop and multiply after it was cut down, and if effectual means were not used by importers and others to destroy them they would speedily devour some kinds of wood and make them quite useless.

THE *Birmingham Post* says:—The certificates now being issued to the successful candidates at last year's council examinations of the Midland Institute have been specially designed by Mr. Walter Crane. The letterpress is surrounded by the branches of a tree springing from the fountain of knowledge, at which doves are drinking; aspiring souls are seen in various stages of ascent, one of whom has succeeded in securing the fruit. The lamp of truth shines among the topmost branches of the tree.

UNDER the Omnibus Bill, which the Midland Railway Company will introduce into Parliament next session, power will be sought to raise 600,000*l.* additional capital by the issue of new ordinary stock, and to borrow upon debenture stock a further sum of 200,000*l.* The whole of this capital is proposed to be expended on widenings and improvements at St. Pancras, in the construction of about 1½ miles of junction railways in Yorkshire, in the acquisition of additional lands in Nottinghamshire, Derbyshire and Yorkshire, and upon improvements on the Eastern and Midland Railway in Lincolnshire.

AT the meeting of the London County Council on Tuesday, the chairman of the Works Committee submitted a table showing the estimated and actual cost of fourteen completed works. It proved, he said, that the Council had not done an unwise thing in instituting the department through which they did work for themselves. Nine out of the fourteen works were done at less than the estimated cost by the engineer or architect, while only four exceeded that cost, and two by a very small amount. On an estimated expenditure of 20,911*l.* an actual saving had been effected of 2,646*l.*, or 12½ per cent. Consideration of the report was deferred.

THE Worthing Town Council have voted a sum of money not exceeding 200*l.* to enable the French scientist, M. Hermite, to test his experiments upon the treatment of sewage with electrolysed sea-water. The inventor claims by this process of electrolysis to decompose, dissolve, bleach and render perfectly inodorous and innocuous actual sewage matter, and to

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destroy all microbes. The members of the Institute of Preventive Medicine have requested Sir Henry Roscoe and Dr. Ruffer to test the result, both chemically and bacteriologically.

IN New South Wales the practice appears to be increasing of giving contracts for labour without materials. The following advertisement from a Sydney journal shows that public departments have adopted the principle:—"Separate tenders (labour only) for carpentering, plumbing, slating, plastering and painting are invited for the erection of a weatherboard cottage residence for the principal of the Hawkesbury Agricultural College. Plans and specifications may be seen at the office of the Chief Clerk, Department of Agriculture, Macquarie Street, Sydney; or at the College, Richmond. The lowest or any tender not necessarily accepted."

ROTHLEY TEMPLE, in Leicestershire, the birthplace of Lord Macaulay, has been sold by private contract for over 40,000*l.* by Messrs. Hampton & Sons, London. The lot disposed of includes the mansion, Knight Templars' chapel and crypt, and manorial rights, with about 900 acres of land.

THE *Newcastle Journal* says that the trustees of the late Lord Crewe have sold to Lord Armstrong, subject to the approval of the Charity Commissioners, the Castle of Bamborough, together with some adjacent land and houses. The castle stands on an almost perpendicular rock looking over the sea—formerly a fortress of might, now a house of charity. Since 1720 it has been used for the Bishop Crewe's Charity, and it has been kept in good repair, much of the old ruin being restored and converted to charitable uses. The castle is also used for signalling purposes. To sailors on that perilous coast Bamborough Castle is what the Convent of St. Bernard is to the traveller on the Alps.

THE annual dinner of the Association of Master Painters of Scotland and the Glasgow Master Painters' Association has just been held in the North British Station Hotel, Glasgow. Mr. Hugh McCulloch, president of the association, occupied the chair.

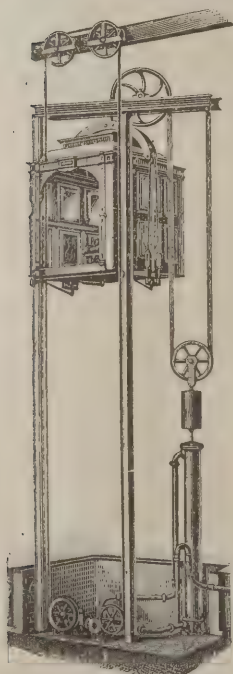
FOR several years the tenants of Ashwick Court, Shepton Mallet, the residence of Dr. Newton Wade, have complained of the fouling of the well whence the supply of water for domestic and other purposes is obtained. During the drought last year the cause was discovered to be petroleum oil, of which a considerable quantity was obtained from the well. In pumping out the oil lately the quantity of oil increased.

A SCHEME has been formulated by the Midland Railway Company for the widening of their line through Camden and Kentish Towns. At present all the traffic, both main line and suburban, is worked by one pair of rails to Kentish Town, whilst the accommodation at that station, as well as Camden Town, is very limited in extent. By the new scheme the suburban passenger lines from the city will be carried alongside the main passenger lines, and new stations will be constructed at Camden Town and Kentish Town, and an entirely new line will be made from Kentish Town to join the Tottenham and Hampstead Railway, doing away entirely with the present objectionable junction with the main passenger line and with the level crossing on the goods line. The plans show that a large area of land is proposed to be taken for an enlarged and convenient station at Kentish Town.

NOTHING could be more gratifying to the organisers of "Constantinople" at Olympia than the success that has attended their genuine efforts to please. The pageant on the lake, reflecting from its green bosom the fairyland of the immense stage, gives a charm to the whole. While the last tableau still holds the boards, there comes from the canal through which caiques with their Turkish boatmen carry passengers to the Watery hall of 1,001 columns, a procession of eight galleys, a dream of ancient Carthage, Egypt, Rome, Tyre and Sidon. The first galley bears a representation of the reception of the Queen of Sheba by King Solomon, with winged bulls of Assyria at the prow of the vessel and Eastern maidens in flowing white robes holding fans of ostrich feathers above the King's head. Antony and Cleopatra are in the next galley. The Empress Theodora fills one with truly Byzantine splendour. Constantine, founder of the City of the Golden Horn, occupies another, with his Court. The next is devoted to a tableau called "Salamambo, the Mystery of the Sacred Veil." "The Glories of Mahomet II." blaze on the sixth. The seventh shows the victorious Moors in Spain. The last bears representatives of those tough opponents of old-time Turks—the Knights Templars. Every galley is low in the waist and high at poop and stern, after the old pattern. Their slow and stately progress round the lake is apparently due to picturesque oar-like bakers' shovels, handled by picturesque rowers.

THE *Manchester Guardian* says:—The works in connection with the supply of hydraulic power in the city have made satisfactory progress, and although February 1 was the time fixed for the commencement of the supply to the public, the Waterworks Committee felt themselves in such a forward state that

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Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.
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BELLS AT
Craig-y-Nos Castle
(Mad. Patti)
Eddystone Lighthouse
Birmingham Municipal
Buildings
Hove Town Hall
Burnley, Holy Trinity
Church
Crawley Parish Church
Corbridge-on Tyne
Parish Church
Widmermere Church
Eiffel Tower, Paris

they turned on the pressure in the mains previously, and the first connection was made for working a hoist at the new warehouse erected by Messrs. John Noble & Sons, Limited, Piccadilly.

At Methil a new dock will be commenced about the beginning of March. Space is being at present cleared for placing the contractor's plant. The dock, when finished, will probably be the most complete of its kind on the shores of the Firth of Forth, having all the latest improvements in machinery for the shipment of coal and for the general working of the dock. The dock will have an area of 7 to 8 acres, with a depth of 28 feet of water on the sill.

THE *City Press* says the numerous friends of Sir John Monckton will be gratified to learn that the movement started in the City for recognising in some permanent way the services rendered by him as Town Clerk during the past twenty years has been received in all quarters with the utmost favour. It is suggested to offer to the Corporation a marble bust of Sir John for exhibition at Guildhall, and to present some agreeable souvenir to Lady Monckton.

A LOCAL GOVERNMENT BOARD inquiry has been held at the Town Hall, Uxbridge, with reference to a loan for works of sewage disposal. Mr. Garner, solicitor to the Board, explained the reasons for the application for the loan, stating that it included the construction of precipitation tanks for the ferrozone treatment, six Polarite filter-beds, together with sludge pressing machinery, air-compressing plant, and engine with pumps for raising the sewage. General Carey expressed himself well satisfied that the scheme was a good one, and it is intended to proceed with the work almost immediately.

THE Bromyard Rural Sanitary Authority have decided to erect a hospital for infectious diseases. The structure is estimated to cost something like 1,250/. In addition to the wards there will be outhouses, washhouse, fumigating-room, &c. The Sanitary Authority applied to the Local Government Board for permission to borrow 1,250/. for thirty years.

BUILDING AND BUILDERS.

THE Rochdale Theatre Royal and Opera House has been destroyed by fire. Within an hour the building was quite burned out. The damage, which is estimated at 10,000/., is covered by insurance. The theatre was built in 1867.

ONE of the largest fires that has occurred in Oldham for a

considerable time took place at the Rye Spinning Mills, and the flames, fanned by a gale, spread so rapidly that two mills were burned to the ground and some adjacent property destroyed. The loss amounts to over 80,000/.

THE Mineral Waterworks at Chislehurst have been destroyed by fire. The damage is about 3,000/. The premises were partly insured.

A BLOCK of buildings, comprising five lock-up shops, a temperance hotel and a temperance hall, at Port Erin, has been destroyed by fire. The damage is estimated at about 10,000/.

NEW classrooms, lavatories and cloakrooms are about to be erected at West Cornforth Schools, for the Cornforth U.D. School Board; and new classrooms and other alterations at Peases West Schools, for the Crook and Billy Row U.D. School Board, both from designs and under the superintendence of Mr. H. T. Gradon, architect, Durham.

THE *Liverpool Courier* says a start has been made with pulling down the old buildings in the block bounded by King Street, John Street, Church Street, and Lord Street, Douglas. Fifty men are engaged under Mr. Taylor, town surveyor. The cost of acquiring the old property is about 13,000/. in excess of the estimate.

THE historic Gray's Inn Chapel has been reopened. During the alterations, which were carried out under the direction of Mr. Shoppee, the architect, two three-light Tudor windows and a holy-water stoup were found embedded in the south wall; these are now left exposed. The pulpit is of carved oak, and has been in use from the reign of Elizabeth.

TRADE NOTES.

ON the 26th ult. Easton, Anderson & Goolden, Ltd., was registered, being an amalgamation of Easton & Anderson, the old-established engineering firm, of London and Erith, and Messrs. W. T. Goolden & Co., electric engineers, Woodfield Works, Harrow Road, London. The former firm, who for so many years have had an extended connection in hydraulic and general engineering work, have more recently been paying attention to the development of electric transmission. In their Erith works for some four years travelling cranes of 15 and 20 tons have been at work, driven electrically. A special department has been established in their works for the execution of various electrical work. The firm of Goolden & Co. have been

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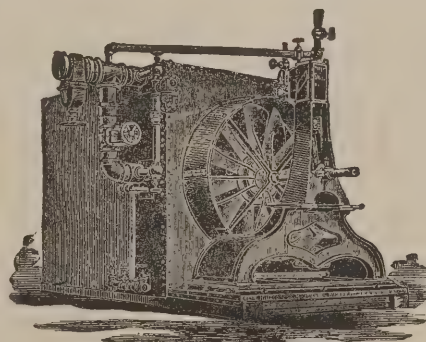
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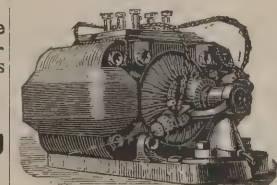
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IMPROVEMENTS IN DUBLIN.

A LOCAL GOVERNMENT inquiry is being held in Dublin respecting a scheme for the erection of artisans' and labourers' dwellings in the area lying between the cathedrals of Christ Church and St. Patrick's. The project had been originated by a deputation of ratepayers representing the Ratepayers' Improvement Protection Association, who waited on the Council on Monday, February 1, 1892. The deputationists represented that there was a probability of the whole of Woodquay Ward becoming derelict if the state of affairs was allowed to continue. One of the streets in the ward—Wood Street—at present had only three houses, although once a street of importance, and in Golden Lane about half of the houses had been demolished. Bride Street was in the same condition. Patrick's Close and Bull Alley had also become depopulated and dilapidated. And in Nicholas Street and other localities a great number of houses had fallen. Altogether 390 houses had been demolished, with the result that 10,000 inhabitants had left the district. Artisans' dwellings were badly wanted in the district. The committee, before bringing in their report, had visited the locality and found large tracts on which there was no longer a vestige of former dwellings. Many houses were roofless and crumbling away, and few remained capable of being restored and adapted as habitations for human beings. A wide area adjoining the north of St. Patrick's Cathedral had been acquired by the Queen's Jubilee Celebration Com-

mittee, who contemplated transforming it into an open space for recreative purposes. The traders in the ward, and those interested in its prosperity, did not favour that project; they thought that the ground should be utilised as a site for healthful dwellings, which would admit of the return of the population that was driven off by exigent circumstances. There was, in the opinion of the Committee, a pressing need for house accommodation in the locality. The unfenced spaces were being made repositories for all kinds of filthy and obnoxious substances. By night they were frequented by evil-doers, to whom they offered a convenient place of retirement and concealment, and altogether it continued a menace to the law-abiding people inhabiting its environs. The estimated cost of the project was 63,000*l.*, of which 30,000*l.* would be for the acquirement of property, and 33,000*l.* for the works. The scheme was intended to give accommodation to 128 families.

PROPOSED AERIAL CABLEWAY.

THE Devil's Dyke, near Brighton, is, *Engineering* says, a steep and narrow gorge running some miles inland, and across which at present there is no other means of communication than by descending the cliffs on the one side and going up them again on the other. A company has recently been formed to supply a much wanted means of communication across this chasm. An ordinary bridge is out of the question, the span required being 650 feet, and the cost, therefore, would be out of proportion to the traffic expected. The plan to be adopted is a modified telfer system, the invention of Mr. W. J. Brewer, C.E. The main feature of this system is the fact that the car to carry the passengers or goods runs on two parallel cables, which are supported at 25 feet intervals from a main suspension cable. The car cables are under considerable tension, and, being supported at such short intervals, sag but little. Each car can carry a load of 4½ tons, and they may be run in trains of as many as twenty-four cars. At the Devil's Dyke cable haulage is to be used, but in future applications of the principle electric traction is contemplated. The towers supporting the main suspension cables have openings in them through which the cars can pass, so that any length of line can be traversed, the system not being confined to the working of a single span. Curves and switches have also been devised, and, in short, the company are prepared to undertake the erection of a regular railway on the system, complete with switches, sidings, and all the usual appurtenances of such.

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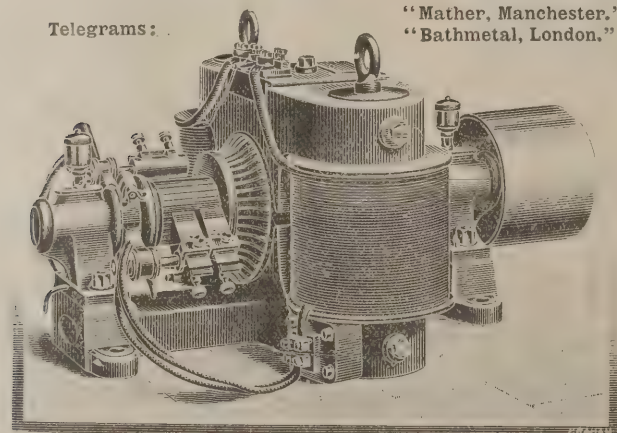
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BUILDING IN JOHANNESBURG.

THE following excited letter has appeared in the *Johannesburg Star*: In your issue of Dec. 22 appears a letter from Mr. Lennox Canning in which reference is made to the work at Green's Chambers. We regret that Mr. Canning, in defence of the bad workmanship in his buildings adjoining Green's Chambers, has felt compelled to make misleading statements, and we would esteem it a favour if you would kindly grant us space in your valuable paper to reply to them. We may state that Mr. Canning was appointed, in London, architect to the Johannesburg Office and Safe Deposit Company, but they afterwards considered their interests would be better served by dispensing with his services. We also take this opportunity of stating that Mr. Canning's plans are not being carried out by us, nor did we see Mr. Canning's plans until ours were completed. As Mr. Canning has made reference to the suit of the Johannesburg Board of Directors v. Victoria Buildings—an action still undecided—we may state that the only parallel consists in conscientious work being carried on at the side of a dangerous structure.

We quite endorse Mr. Canning's sentiments with respect to extended powers being given to our building inspector, especially with regard to the depths and nature of foundations. Then there would be no necessity for shoring up such ruins as exist in Johannesburg until a sound building is erected to support them. It is more to be regretted that a building inspector was not appointed, acting under London building laws, when such buildings as the Barnato Buildings, Robinson's Buildings, the old portion of the Exchange, and many other of Mr. Canning's buildings, were in course of erection. As particular reference has been made by Mr. Canning to these buildings, a few particulars with regard to their foundations may be of interest. The Barnato Buildings foundations are composed for the greater part of loose rubble work, laid dry without mortar on soil, and as from 4 to 5 inches of these foundations projected on to our ground, the owners of the buildings were under the necessity of cutting away the projections and filling in the holes in the wall with lime mortar. Whilst this work was being carried out, some of these stones were so loosely built as to fall out into the side trench. On the Robinson's Buildings side, the so-called concrete foundations set in, instead of projecting 4 inches under the 14 inch superincumbent three-storey brick walls. This wall oversails the foundation, some of the stones in the concrete being 5 inches in diameter, and the depth of the

foundation being only 18 inches from the surface. Settlements existed in this wall long before the old Green's Chambers were pulled down, and tie-bolts had been fixed to prevent further settlement. Mr. Canning states that he informed the Board of the Johannesburg Office and Safe Deposit Company in London that he had long experience of the nature of the subsoil of Johannesburg. If he had gone a foot deeper his experience might have been altered so as to suggest to him the advantage of building on a sound foundation, as a gravel bed is reached at that depth reposing on a clay shale, and we are inclined to believe that his advice to the Board could not have been based on the treacherous nature of the soil, as it does not exist deeper than 3 feet from the surface, but on the treacherous nature of the foundations of the buildings erected by him flanking the site of their proposed building. To prove that the ground in this locality is not of the treacherous nature Mr. Canning would have us believe, if foundations are carried down to a proper depth, the attention of the public might be drawn to the basement now being excavated on the site of Messrs. Malcomess's old store, against Natal Buildings, in exactly the same soil and about 70 feet away from Green's Chambers. There the basement has been excavated straight down at the side of a building erected at a time when Mr. Canning excuses his work because he could not obtain good material. This work would be an impossibility against the sides of Barnato or Robinson's Buildings without those buildings falling in. Mr. Canning also states that on his plan the basement was 10 feet away from the adjoining walls. At the Robinson's Buildings side our basement is 10 feet 6 inches away. Mr. Canning may find, if he chooses, old settlement cracks in the Robinson's Buildings elevation to the streets and away from Green's Chambers, and although the colouring of the front has been so prettily done in Mr. Canning's estimation, these cracks can still be seen, as also in Royal Chambers, immediately adjoining, which was also erected by him. Mr. Canning states that his next article will be on the maintenance of buildings. This, we have no doubt, will be anxiously looked forward to by his late clients.—We are, &c.,

December 29.

CLAYTON & WILLIAMS.

THE Surveyors' Institution meets on Monday, the 5th inst., when a paper will be read by Mr. H. Blackburn on the "London Streets and Buildings Bill, 1894," of the London County Council.

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LAND VALUES.

IN a letter to the *Times* Mr. E. H. Bousfield writes:—Some of us are thankful that there is a House of Lords, but how much more should we be for the London County Council, so great is the solicitude of that body for the "unemployed." Hitherto the Council have chiefly concerned themselves with the two extremes of society, finding work in plenty for the labourer in his fustian and for the peer in his ermine. Henceforth the working man in broadcloth is to be the object of their care. Work for the unemployed!—a beneficent aspiration. Long years have gone by since the palmy days for lawyers and surveyors; how many of them have grown weary in waiting for work? But, the County Council to the rescue! No sooner has "betterment" been rejected by the Lords, without much labour on their part, thus suddenly blighting the brilliant prospects of the combined professions, than hope revives. They are not to be disappointed, though "betterment" goes to the wall. The Council, at their meeting recently, have adopted their committee's report and their vice-chairman's amendment, and have resolved to ask the Government to bring in a Bill, one effect of which will be practically to create a new land tax on the whole metropolitan district, and on the provincial towns and cities throughout the kingdom, the entire areas thereof to be subject to a valuation of the sites, as though no buildings existed. Here indeed is work for the unemployed surveyor. But that is not all. When his ingenuity has put a "fancy value" on every site, it is open to be questioned, and a "Valuation Court" is to be instituted, that the lawyer may have his turn. It really seems too good to be true; the heart palpitates, the mouth waters at the prospect of the spoils. And yet there is more to come; the splendid revenue this new land tax is to produce, estimated at probably a million a year in London alone, is to be the nest-egg for metropolitan improvements. What glorious visions of compensation cases, arbitrations, juries and all the paraphernalia of the law come forth in startling array before the mind of the unemployed professional working man?

But, on its merits, what a noble and self-sacrificing idea this principle of rating ground values is—a new land tax of from 4 to 10 per cent. to be levied for improvements, from which those who are to pay the tax may not necessarily derive any benefit, or even receive from the site as much as the tax will amount to, while already they pay their full quota of Parliamentary and parochial rates and taxes in respect of such land.

"GREEK LINES."

A VOLUME of essays by Mr. Van Brunt, the American architect, has appeared with the title "Greek Lines and Other Architectural Essays." According to the *Kansas City Star*, it reveals an amount of poetry of high sentiment that is somewhat of a surprise; it is a quality not heretofore suspected in the work of this successful architect, in spite of the fact that he has made of his profession a worship of beauty.

Most of these are early essays revised, and brought into a sequence. They are not elementary by any means, but they are stimulating, inspiring. Where Mr. Van Brunt treats of something which his unlettered reader does not understand, he implants an ardent desire in that reader to at once amend his ignorance. When the essays involve a reference to something with which the reader is not familiar, he is at once impelled to follow it up, in order to enjoy to the fullest this delightful book.

Mr. Van Brunt thus traces the source of art and the real source of the appreciation of it, art criticism:—

"The human heart, in its best estate, for ever yearns to create, to give in some form expression and life to those evasive ideals of loveliness which are planted within our consciousness by the aspects of nature. It is impossible for a true work of art to exist unless this great creative principle of love is present in its inception, in its execution, in its detail. It must be pervaded with the warmth of human, passionate affection. The skill which we are so apt to worship is but the instrument in the hands of love. It is the means by which this humanity is transferred to the work, and there idealised in the forms of nature. The test of art is in our own hearts. It is not to the dogmas of critics, the artificial rules of æsthetics, that we wisely resort for judgment concerning works of art. Though our opinions may be warped, there are depths of immortal truth within us, which, when dimly revealed in some rare moment of insight, seem to show that we possess a standard and a criterion far nobler than the schools can give us."

Such is Mr. Van Brunt's theory, and supremely interesting is the reasoning on which he builds it up; the essay becomes, in reality, a series of illuminating glimpses into the history, the attainments, of the nations. And this too, Mr. Van Brunt claims, that architecture reveals more of the real life of a people than written history does.

In one place the author writes:—"Art which is systematised

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is degraded. What all Roman art wants is the inward life, the living soul, which gives a peculiar expressiveness to every individual work, and raises it infinitely above the dangerous formalism of the schools." These enlightening words apply as clearly to work of the present day.

The chapters on the Greek lines contain a condensed history of architecture down to the present time, and particularly interesting are the pages on the Gothic and on the Renaissance architecture. Another essay reviews "The Present State of Architecture," and in it Mr. Van Brunt holds out high hopes of what American architects are to accomplish.

The essay on "Conscience in Architecture" bears a title not in itself attractive, but it will probably be read oftener, be enjoyed more, be quoted oftener than any other essay in the book. It is a contrast of the attitude of the artist of to-day, as compared with the artist of former ages.

From this beginning the author goes on to the art of the Greeks, which appeals directly to "the sympathetic depth of our souls and the half impalpable ideals there."

Taking up his subject of lines, Mr. Van Brunt continues:—

"Abstract lines are the most concentrated expressions of human ideas. They are the grand hieroglyphic symbolism of the aggregate of human thought. I believe that all true lines of grace and beauty are capable of division into three distinct classes, according to the respective spirit or genius of the three civilisations out of which they grew, and that each class, as it expresses a unity of great significance in the history of the human race, is capable of concentrating its distinguishing characteristics in one representative line, which may stand as the symbol, the gesture, as it were, of an era in this history. The three great distinctive eras of art, in a purely psychological sense, were the Egyptian, the Grecian and the Romanesque. The lines, which are the concentration of three civilisations, represent Destiny, Love and Life—destiny finding utterance in the stern and inflexible simplicity of the tombs and obelisks of Egypt; love expressing itself in the statuesque and thoughtful grace of Grecian temples, statues and urns; life in the sensuous and impulsive change, evident in all the developments of art, since Greece became a province of the Roman empire."

"The artists of antiquity found simplicity and repose in more fidelity to a rigid standard. Their ideal was a divinity; their service to this divinity was worship and obedience. Our ideal is a museum of heterogeneous and beautiful forms, and our service to it is selection, classification. Indeed, the

modern artist is not the servant of his ideal; he properly seeks to be its master. The individual can no longer be lost in his art. A new, subjective, personal element has been born into art. Now the artist says, 'I not only feel, but I understand.'"

Mr. Van Brunt sums up this subject with:—"Our present conditions of life must give to art in all its forms certain distinctive characteristics. These conditions require the establishment of principles and not forms as standards of excellent work. They make forms the language and not the end of art. The very finest result of high culture in architecture as in literature is to utter thought with simplicity."

"The Personal Equation," the next essay, takes up and elaborates the historical architecture touched on in the finishing chapter of the essay on Greek lines. Here again the Gothic and the Renaissance architectures, the spirits of those ages, are clearly and charmingly presented.

In "The Royal Château of Blois," Mr. Van Brunt illustrates his theory of the great value of architectural evidence in the history of a nation's life. This essay makes it a temptation to say that it is even more interesting than the other essay just designated as the most interesting in the book. Blois is in itself so full of romance, so crowded with history, that when Mr. Van Brunt's clear explanations open one's eyes to so much beauty in it, its spell grows powerful.

"Architecture and Poetry" really holds less of the spirit of poetry in it than does the "Greek Lines," the opening essay, which is like a hymn to beauty. In "Architecture and Poetry" Mr. Van Brunt discusses the different things the poets have said in describing architecture, quoting Lowell, Wordsworth, Dante and half-a-dozen others, and at the end he offers a poem which expresses what the architect with his greater vision sees in a church door. Thus begins the poem:—

Twice four hundred years have borne
To this doorway, gray and worn,
Weary weights of grief and sin;
Contrite have they entered in,
And, beneath the arch of stone,
Laid their burdens down, and known
That to faith, whate'er betide,
The doors of heaven are opened wide.
For with invitation sweet,
The pastoral church, her flock to greet,
To fold, to comfort, and to feed,
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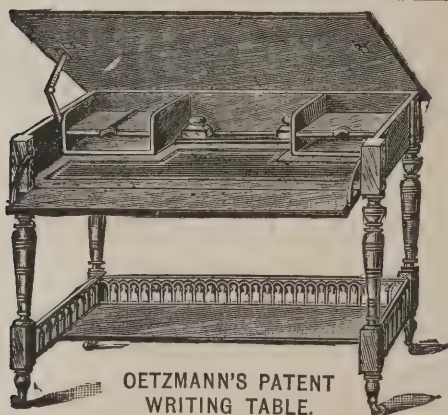
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GLASGOW CATHEDRAL.

THE ELECTRICAL TRADE AND THE ANTWERP EXHIBITION.

A MEETING of the electrical trade section of the London Chamber of Commerce has been held at St. Botolph House, Eastcheap, to consider the advisability of the industry as a whole lending its support to the Antwerp International Exhibition which opens in May next. Mr. E. Garcke, who presided, said he had approached a number of electrical manufacturing firms on the subject, but they did not show much disposition to do anything. Personally he did not think the Antwerp Exhibition would appeal to the trade generally, especially so far as the manufacturers of dynamos and other articles of the kind were concerned. As a matter of fact the Continent was very largely closed against English firms who manufactured electrical apparatus, owing to the duties, which were very heavy in Germany, France and Austria. In the course of some discussion it was stated that by exhibiting their goods at Antwerp English firms would be doing themselves little if any good, whereas they would give their competitors the opportunity of learning a great deal from them. On the other hand, it was recognised that English people were not likely to improve our trade by abstaining from such exhibitions, although it was felt to be very hard that the charges for duties should be thrown upon individual firms. It was eventually decided, at the suggestion of the Chairman, that a circular should be issued to the trade bringing to their notice the opportunity of obtaining space at special terms by applying to the London Chamber of Commerce.

By a majority of 797 the ratepayers of Bangor have authorised the Town Council to apply for a loan of 25,000*l.* for the creation of a pier, and the purchase of the ferry rights across the Menai Straits.



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BUILDERS' CLAIM.

At the adjourned holding of the Flintshire Assizes, held at Chester Castle, Mr. Justice Bruce heard an action brought by Messrs. E. Thorpe & Sons, builders, Llandudno, against Mr. George Smith, Llandudno, to recover 105*l.*, balance of amount alleged to be due to plaintiffs for work done in respect of defendant's premises at Llandudno. Mr. E. Honoratus Lloyd appeared for the plaintiff and Mr. Bryn Roberts, M.P., and Mr. Colt Williams represented the defendant. It appeared that in September 1892 defendant engaged plaintiffs to erect a new porch at his residence, and subsequent to this, other work was also carried out on defendant's premises by plaintiffs. Evidence was given by two architects to show that the amount charged for the work was reasonable. Defendant disputed the claim on the ground that plaintiffs entered into a contract to carry out the work for 200*l.*, and it was further submitted that the work had not been satisfactorily done, and that defendant had supplied certain materials. His lordship in reviewing the evidence said he could not come to any other conclusion on the evidence than that the prices charged by plaintiffs were fair. He also considered that the work had been satisfactorily done. He could not see that defendant had established any defence to the action, and it seemed to him that plaintiffs had established their claim with the exception of one item, for which he should deduct 2*l.* 6s. 6d. He should give judgment for plaintiffs for 103*l.* 5s. 8d., with costs.

ELECTRICITY.

At the meeting of the Birmingham Midland Institute, Professor Silvanus P. Thompson, F.R.S., lectured to a large audience upon "The Supply and Measurement of Electricity." He said that ever since the time when electricity became a commodity to be supplied to the public from large central establishments, it had become a matter of general interest to the consumer to know something of the mode in which he was supplied, and of the way in which the commodity was measured. He directed attention to a series of diagrams showing, from the experience of several electric supply stations, the manner in which consumption varies, according to the period of the year and according to the day. He then described some of the methods of laying out circuits, and exhibited a variety of illustrations of generating stations. In this connection he compared favour-

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ably the arrangement of powerful but compact engines in direct connection with large dynamos which were to be seen in English generating stations, and among them the one in Birmingham, with the fussy array of small dynamos, driven through the intervention of elaborate shafting and belting, which had found favour with American engineers. Nothing was more strange, he said, to an American than the high-speed direct Willans engine and solid-looking dynamo exhibited from this country at Chicago last year. The system of converting high-pressure currents which could be conveyed long distances by small conductors into low-pressure currents, such as were safe to introduce into buildings and requiring large conductors, was next described, and then explanations were given of the meters which had been devised for measuring the current, from the early meters of Edison and of Spragg, of Birmingham, in which it was gauged by the amount of copper or zinc-electro deposited in a bottle, to clockwork meters, in which the retardation of a pendulum by the current was the principal factor, to several forms of electro-motor meters. A special word of commendation was given to Mr. G. Hookham, of Birmingham, for the share he had taken in connection with the solution of electric-meter problems. The general effect of his discourse, which, notwithstanding the technical nature of the subject, secured general attention, was to show how rapid had been the stride made in the twelve years since electricity began to be supplied in 1881, alike in the appliances for generating and distributing the electric current and in the various accessories for the benefit and safety of the consumer.

WATER DAM IN CALIFORNIA.

THE completion of the Turlock and Modesto irrigation dam gives California, the *Pacific Lumberman* says, the largest and highest overflow dam in the world. The contract for the great structure was let in June, 1891, and although two years and a half have elapsed, the preliminaries and the months lost by reason of high water reduce the actual working time to fourteen months, during which period 150 men—all white—were employed. It will be readily appreciated that the preliminary work, including the diverting of the waters of the Tuolumne river by means of flumes, and the excavation to bedrock for the base, was a task of no small magnitude. Added to this was the necessity for lowering the machinery employed, including nine donkey and stationary engines, from the summit of a hill

towering above the scene of operations on the hillside and in the river bed. All the supplies, too, were handled in this manner.

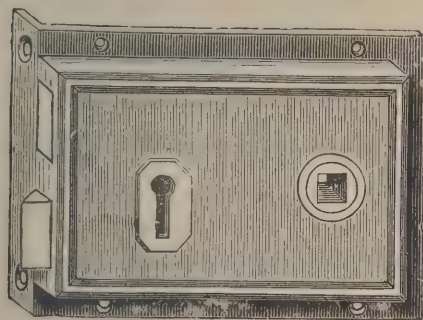
The dam, it should be premised, is situated on the Tuolumne river, where that stream foams through a canyon in the foothills of the Sierra Nevada range of mountains, a mile and three-quarters above the old mining town of La Grange and about thirty-three miles east of Modesto. The ragged, mountainous hills that tower on either side are of blue trap formation, covered by a scanty soil, and at the site of the dam the conformation is such that the masonry laid by the builders interlocks with and is supported by the hillsides. The original plans of the dam were approved by Colonel Mendell, the noted civil engineer, and have been followed without material change. It is constructed on the principle of an arch, on a radius of 300 feet; hence its surface length on the top is 336 feet, while a straight line drawn from bank to bank would be but 317 feet in length. Its base is 70 feet in length and 97 feet through, sloping upward on the lower side at a ratio of 4.67 feet in 10 feet, so that at a height 11 feet from the top, from which point it is rounded to carry the overflow water down the slope, its breadth diminishes to 24 feet. The upper wall is perpendicular, and both upper and lower walls are of shaped rock laid in cement mortar.

Embraced in this stupendous structure are approximately 40,000 cubic yards of rubble masonry. Over 31,000 barrels of cement, each weighing 400 lbs., entered into its construction. The centre of the dam, between the face walls, is comprised of great masses of blue trap embedded in concrete, the interstices filled with smaller rock and concrete, and the whole thoroughly rammed. The rock is the blue trap of the country blasted from quarries opened near the spot, drawn up an inclined railway and conveyed to the spot required by a system of elevated cable tramways. The concrete used is composed of a mixture of 22 cubic feet of broken rock, 8 cubic feet of sand and one barrel of cement, washed and mixed in a revolving mixer operated by steam and conveyed to the dam by the cable tramways.

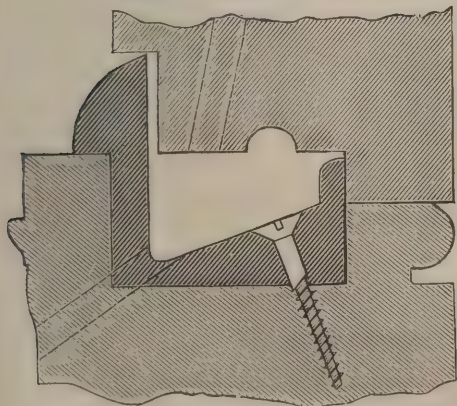
Two sand-ways are provided for in the dam, but the water not taken out by the canals is to go over the top and down the inclined lower wall to the bed of the stream, impinging first on the "leg" of the structure, which, of rubble masonry, extends out some distance and obviates all possibility of undermining.

A great reservoir is formed by the dam, the water of the river backing up for three miles. This winter and next spring, at times of freshets, a volume of water ranging from 5 to 20 feet

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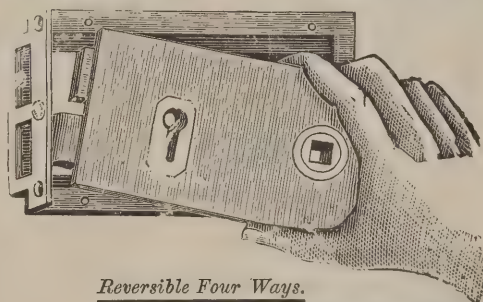


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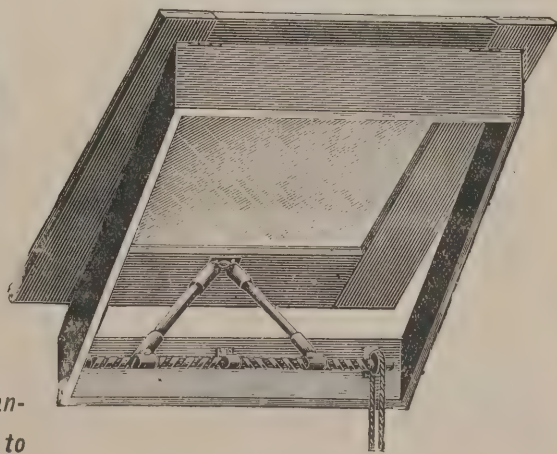
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in depth will pour over the structure. The cost to the districts of this most essential factor in the irrigation enterprise ranges from 525,000 dols. to 550,000 dols. equally divided. The main canals designed to carry the water to the irrigation districts are well advanced, and have a carrying capacity estimated to be sufficient to give an average of 1 foot of water for every quarter-section embraced in the 257,000 acres comprising the two districts. While the advantages to accrue from the use of the water in this direction overshadow all others, the fact that there exist great possibilities for the generation of power to be transmitted through the medium of electricity has not been lost sight of.

NECESSARY WORKS IN STREETS.

ON Tuesday judgment was given in the Court of Appeal by the Lords Justices in *Stroud v. the Wandsworth District Board of Works*. This was an appeal, says the *Times*, against the decision of a Divisional Court (Mr. Justice Charles and Mr. Justice Wright) reported in the *Times* of November 11 last, and in the *Times* Law Reports, vol. 10, p. 50. The case raised an important question under the Metropolis Management Act of 1890 (53 and 54 Vict., c. 66, s. 3) and similar statutes, as to the power of local boards to order "necessary works" to be done at the expense of owners of property—whether this means actually necessary in the view of the magistrate or necessary in the view of the board. The appellant, Mr. Stroud, is the owner of a house and land within the Wandsworth district abutting on a road which had been used for more than six months for public traffic, and had not become repairable by the board. On March 27, 1892, the board resolved to execute some repairs on the road under the powers given to them by the Act, the repairs being deemed by them to be necessary. The works were done in pursuance of the resolution, and the expenses were apportioned among the adjoining owners. Section 3 enacts that "any vestry or district board may from time to time execute any necessary works of repair upon any or any part of any carriage road within their parish or district which shall have been used for not less than six months for public traffic, and which may not at the time of such repair have become repairable by them, and shall not by undertaking such repair prejudice or affect the powers of such vestry or district board to apportion and recover the expenses of paving such road or way if and when the same shall be paved as a new street under the Metropolis Management Acts"; and then

it is provided that the expenses of such repair may, in the first instance, be paid by the local authority in the same manner as the expenses of repairing other streets repairable by them, and afterwards be apportioned and recovered from the owners of adjoining lands in the same manner as expenses of paving such road as a new street. On the hearing of a summons claiming from Mr. Stroud the sum of 26*l.*, the amount of his share of the apportionment, he proposed to contest the necessity of the repairs; but the magistrate was of opinion that it was not for him to decide whether the repairs were necessary or not, but that he was bound by the decision of the board on the point, and he accordingly ordered Mr. Stroud to pay the amount. He appealed to the Divisional Court, and the learned judges, with some hesitation, especially on the part of Mr. Justice Wright, held that the board, provided that they acted *bona fide* (and there was no allegation of want of *bona fides* in the present case), were the sole judges of the "necessity" of the work. The decision of the magistrate was, therefore, affirmed, but leave to appeal was given. Mr. Stroud appealed.

The Court dismissed the appeal.

Lord Justice Lindley said that the case raised a question of some little difficulty, viz. Who was to be the judge of the necessity of the repairs executed by the Board under section 3 of the Act of 1890? His lordship thought that the solution of the difficulty was to be found in considering the object of the section. It was in substance an addition to a group of sections in the Metropolis Management Acts of 1855 and 1862 relating to the paving of streets. The local authorities had by those sections power to pave "streets," but they had no similar power with reference to roads which had not yet become "streets." Under the old Acts it was clear—indeed it was said so in express words—that the local authority was to be the judge of the necessity or propriety of the work. In his lordship's opinion the true construction of section 3 was that the same persons were to be the judges of the necessity of the repairs executed under that section. He did not think that Parliament intended that two different tribunals should be judges of similar necessities. It was urged that by the change in language Parliament had shown that this was their intention, and reference was made to another Act (cap. 54, section 1) passed on the very same day in the same year, 1890, which dealt with similar matters, and in which the words used were "which shall have been deemed by the board necessary or expedient." The history of this difference was that cap. 54, section 1, was a repeal of former provisions and a re-enactment of them with an

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THE "WASH-OUT" CLOSET

(PATENT).

THREE AWARDS AT THE INTERNATIONAL MEDICAL SANITARY EXHIBITION, SOUTH KENSINGTON, 1881.



WASH-OUT.

"How to Drain a House," from a paper by T. MELLARD READE, Esq., C.E., F.R.I.B.A., read before the Liverpool Architectural Society:—"I consider the pan-closet objectionable, especially since the introduction of the two-gallon regulating cistern has increased the difficulty of getting the after-flush to fill the pan. The 'container' is usually a reservoir coated with filth, hidden by the pan holding the water in the basin. A basin with a trap at the side or back, called a 'WASH-OUT' basin, is a far better apparatus."

"Improvement on Sanitary Condition of Houses," from a paper by J. CORBETT, Esq., read before the Social Science Congress, Manchester, 1879: "We replace defective Closet Appliances by the simple 'WASH-OUT CLOSET,' which is of white earthenware, without any valve, and so perfectly self-cleansing as to require very little attention."

Extract from a letter by "M. O. H.," a Medical Officer of Health, *Daily Telegraph*, September 22, 1880: "The Local Government Board forbids the use of these pan-closets. . . . They may be easily replaced by one of the 'WASH-OUT' CLOSET Basins."

Extract from a lecture by W. RASSIE, Esq., C.E., at the International Health Exhibition, May 28, 1884: "A cleanly 'WASH-OUT' Flushing Rim Basin in connection with a small Flushing Tank overhead which merely required a touch of the depending chain and ring to liberate the whole contents."



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addition, whereas section 3 of cap. 66 was an entirely new one. It was said that the view of the Divisional Court was inconsistent with the decision of this Court in *The Queen v. Marsham* (1892, 1 Q.B. 371). His lordship did not think it was. In that case the Court held that the local authority were not the judges of what were "paving expenses," though they were judges of the propriety of the expenditure, if they could show that it was incurred for paving. It was quite consistent with that decision that the board under section 3 were not judges of what were repairs, though they were the sole judges of the necessity of the repairs. If the Court were to decide differently they would be putting on these Acts a construction which would lead to the wildest confusion.

Lord Justice Kay, in the course of a judgment to the same effect, said he thought the effect of the decision in the *Queen v. Marsham* was that, in order to recover an apportioned part of alleged "paving expenses" from an adjoining landowner, the local authority must show that the work had been done, and that the alleged expenses were expenses of paving, but that they were not bound to show that the expenses were proper. It was for the local board to decide as to the propriety of the expenses. That applied to the present case. The board must show that the repairs had been executed, and that the expenses were expenses of repairing, and then the decision in the *Queen v. Marsham* was satisfied. It did not follow that the "necessity" of the repairs was a matter for the decision of a magistrate. *Prima facie* a public authority, such as a district board, must have some discretion vested in them, and his lordship thought the word "necessary," though not accompanied by the words "which they may think" or "as they shall deem," might be fairly construed as meaning "necessary" in the opinion of the board who had power to do the work and to apportion the expense.

Lord Justice Smith concurred.

THE LONDON COUNTY COUNCIL COTTAGES.

THE London County Council, says the *Daily News*, are rapidly progressing with their new cottage building at East Greenwich, and in a few weeks the first block of these dwellings will be ready for occupation. These will be their first erections of the kind, and a great amount of interest naturally attaches to them. There is, indeed, some danger that an undue degree of importance will be accorded to the outcome of this first experiment

in municipal cottage building by London's great executive. It is very likely that any little structural imperfections or financial shortcomings may be seized upon by the critics of the Council to illustrate the impossibility of this sort of thing being successfully carried out by a public body. There is one respect in which this first enterprise has certainly been a little unfortunate. House-building in this district of London has been forced upon the Council in consequence of their having had to sweep away a good many working-class dwellings for the Blackwall Tunnel works. They were required by Act of Parliament to put up others within a mile of the site of the demolished dwellings. Their operations were thus confined to a radius within which practically all the land is of the nature of a bog. It is, in fact, a part of the Greenwich marshes, all of which consist more or less of a spongy sort of peat. To get at a satisfactory foundation, excavations would have to be carried down to a depth of 13 or 14 feet, and this could not be done without a very expensive use of pumps to keep down the water with which the whole marsh is saturated. Of course this would have added enormously to the cost of the cottages, and would have precluded all possibility of getting a paying rent for them. After much anxious consideration, therefore, it was resolved by the Housing of the Working Classes Committee to make the best of what was felt to be an unsatisfactory site, and instead of excavating down to the solid bottom, to lay down platforms of concrete for the five blocks of cottages designed. The soil was removed to the depth of 3 feet and concrete poured in, so as to form a solid bed, hard as rock, and covering the entire site of each block, with a margin of 3 feet beyond the building all round. Whether eventually the result will prove as satisfactory as could be desired time only can show. Any part of a marsh is liable to be affected by drainage or excavations in any other part, and the subsidence of the concrete foundations may at any time prove troublesome. One of the blocks has already settled down irregularly to an extent which, if the houses upon it were of the jerry-built order, would seriously imperil their stability. They are, however, of first-class workmanship, and the subsidence cannot affect them, and it is believed that no further settlement of any importance is probable.

It is a pity that the first venture of this kind should not have had a more propitious starting-point, for the cottages as designed in the office of Mr. Blashill, F.R.I.B.A., the architect to the Council, and built by the Works Department, are in almost every respect most admirable. They are intended for a

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In architectural and structural ironwork Mr. Hird is specially skilled, and we ask as a favour that you will give us the opportunity of tendering for any work you may have in hand.

Yours faithfully, SAMUEL DENISON & SON, VULCAN FOUNDRY, LEEDS.

population of just under 500. There are, or there will be when they are all finished, altogether 78 tenements, comprising 232 rooms, the occupants of which the Council will endeavour to restrict to an average of two persons to a room in each tenement. The full complement therefore should be 464. The houses are built in five rows, with plenty of space between them. They are all designed on the wholesome principle of making each tenement a complete and separate home, and though of course these homes are very small, they are planned with the most careful ingenuity for the comfort and convenience of the tenants. Ten of the cottages are double, with one tenement on the ground floor and one above. The floors above are sound-proof and fire-proof, and—what is an extremely important matter in property of this class—every part of the house has been designed with a view to make them “vermin proof.” As far as possible the use of wood has been avoided in their construction. The skirting round the walls is not boarding but the hardest of cement, and the walls themselves are of impenetrable hardness. The inner partition walls are constructed on what is technically known as the Cunnah-Wright principle, a combination of thin iron plates and cement specially designed to afford great strength and solidity with very small bulk. Where every inch of space is valuable those qualities are of course very important. As partitions they are in many respects as efficient as the best of brick walls, while occupying far less room. There are thirty tenements of two rooms, which may possibly be occupied by a family of four persons; twenty tenements of three rooms, for a family of six; and twenty-eight tenements of four rooms, each of which may be occupied by eight persons. Each of these dwellings has one room designed for a sitting-room. It has a fireplace of the severest simplicity of plan, the only ornamentation being a surrounding of reddish-brown glazed bricks, with a mantelpiece above. This will be found absolutely impervious to all attempts to damage or misuse, while beneath the chimney is a small and very efficient kitchen range, known as the “Cundy.” It is a closed or open fireplace with a good hot-water boiler and an oven underneath the fire. At the back of each double cottage tenement is a sink with water tap and a closet so arranged that the door is virtually in the open air, being at the side of a small railed balcony. There is gas on the staircases, but no provision has been made for it within the rooms. The single cottages, of which there are twenty-eight, are really very complete and comfortable little houses, on a somewhat Lilliputian scale. Each has a frontage of only about 12 feet 3 inches, but they are exceedingly well planned, and though so small have an aspect of

lightness and airiness delightfully contrasting with many of the dark and stuffy dens in which so many people are doomed to lose health and spirits.

These new “West View Cottages,” as they are to be called, are not absolutely faultless. The necessity of confining the rents of them to about the tune of the rents around them, while making them pay a satisfactory interest on outlay, has forbidden some arrangements that Mr. Blashill and his very able and devoted chief assistant, Mr. Owen Fleming, A.R.I.B.A., would gladly have embodied, while it has necessitated some features that are hardly satisfactory. For instance, the severe economising of space has led to the fixing of cupboards under the windows of the sitting-rooms, and as a consequence of this arrangement the windows are somewhat too high to make the rooms as pleasant as they might be. Then, again, a small coal-cellar, outside each tenement, would have been very desirable. Considerations of space and cost forbade this, and the only receptacle for coal is a wooden bunk in the sitting-room, except in the separate cottages, each of which has a convenient coal-cellar as well as a good scullery. There is one defect in all the sitting-rooms that surely might have been obviated. The tenants will have no means whatever of fixing up a picture on their walls. They are splendid wall surfaces, smooth and hard as marble almost, and, even if practicable to drive nails into them, the regulations will have to forbid it. But surely a picture-rod might have been run along the top of the walls or a strip of wood embedded in the cement. It is very desirable to encourage the embellishment of the home when people are disposed to do it, and, though this may seem a trifle, it is an important trifle.

But when all is said, these new cottages of the London County Council are most admirable. Externally, as internally, they are as plain as plain can be. They are of brick, with red tiles, and not a bit of ornamentation about them in any shape or form. But they are picturesque in their simplicity. Some of their walls as well as their steep-pitched roofs are covered with red tiles in the old-fashioned way one may often see embodied in country cottages. There is none of the dreary repulsive ugliness so horribly characteristic of hundreds of miles of streets in London. The houses look cosy and homelike, and in their warm colouring and bold originality of design present a very striking contrast with the mean and squalid house property in the immediate vicinity, comparatively new though much of that is.

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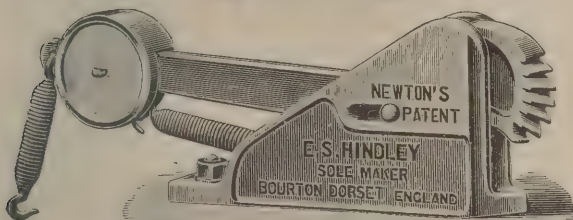
A LECTURE has been given by Dr. Garey on "Atmospheric Impurities" in the Burgh Court-room, Govanhill. In introducing his subject, the lecturer said there were three divisions which might be taken up in considering the large question of public health—(1) the air-supply, (2) the water-supply, and (3) the drainage, which last, however, was intimately associated with both the others. He had chosen to speak of the air supply as being perhaps the most interesting and instructive. In the improvements which had been effected during the last thirty years, science had taught men much that had been invaluable, and during that period the death-rate from preventable diseases, especially in large centres of population, had been reduced to the extent of 25 per cent. and more. In other words, where four had died from preventable diseases, only three now died. A curious calculation made from that fact was that, taking the earning power of each individual as at 20s. per week—which, capitalised at 5 per cent., would give them 1,000l.—they had the enormous increase of about 3,000,000l. capital in Scotland by the saving effected. Every householder should have a clear idea of what entered into the composition of air, its uses and the different ways in which it was rendered impure. This was the more necessary that its impurities were often so impalpable. Water or food readily showed impurity, but some of the most deadly poisons in air were invisible, and were not even to be detected by the sense of smell. Dealing first with the quantity of air required, the lecturer explained how the quantity increased from infancy to middle age, and as years advanced again decreased, and in a popular way he stated the enormous figures involved in the consumption of air by individuals and by communities. He then explained the constituents of pure air, and by experiments showed the different effect of the gases which go to make up our atmosphere; by that means he portrayed their action when breathed into a living body, and the beautiful and complex arrangement by which the waste was collected and thrown out in the form of carbonic acid gas, whose properties and dangerous qualities he explained by simple and convincing experiments. From those he demonstrated that 180,000 tons of waste were thus expended in Glasgow alone. The question then arose, What were they to do? They had the diagnosis. What was the cure? Medical science was largely preventative,

and in that direction they must look. The best and most effective preventative was ventilation, and he strongly condemned the crowding of people together in low-lying districts, and the close confinement resulting from building in squares. One of the simplest and best methods of ventilation was to raise the lower sash of a window, placing a board underneath so as to cause the air to enter in the middle of a room, and in the ordinary kitchen fire they had the necessary means of producing a current. Other causes of impurity were lightly touched upon, as time did not permit of fuller explanation.

NORTH BRIDGE, EDINBURGH.

At a meeting of a sub-committee of the Lord Provost's Committee of the Edinburgh Town Council, new plans were submitted on behalf of the North British Railway Company for the reconstruction of the North Bridge. Mr. Hall Blyth, C.E., attended the meeting in the interests of the railway company, and Sir William Arrol and Mr. Hunter, the law agent of the city, were present to advise the Corporation. The plans submitted showed an ornate design for a hotel at the south-east end of Princes Street, extending backwards to the new buildings, as far as the Tramway Company's offices, and clearing away the premises of Messrs. Cranston & Elliot and the adjoining buildings on the North Bridge. The proposed new bridge covers the railway area in two spans, with a third and shorter span carrying it over Jeffrey Street, while the railway lines between the North Bridge and the Waverley Bridge are covered with glass. It transpired that while the railway company were still willing to contribute 30,000l. towards the construction of the bridge, Sir William Arrol estimated the total cost of the undertaking at 90,000l. It was suggested that although the railway company did not seem willing to pay a sum based on the proportional cost of the bridge, it might be arranged that the company should undertake the building of the bridge, and that the city should limit their contribution to 60,000l. The question of widening the North Bridge was afterwards considered, along with estimates of the cost by Messrs. Cousin & Ormiston, architects, and Mr. Laing, city assessor. The following sub-committee was appointed to consider the whole question:—The Lord Provost, Bailies Dunlop, M'Donald and Steel, Dean of Guild Miller and Mr. Colston.

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LETTER FROM "THE TIMES."

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BAILEY'S LANE BOARD SCHOOL.

THE London School Board on December 7 adopted a resolution, which was moved by Mr. Lyulph Stanley, against the recommendation of the school accommodation and attendance committee, to the effect that a letter be addressed to the Education Department stating that the Board would comply with their lordships' request to at once build upon the Bailey's Lane site, Hackney, a school for 400 children, which, as the numbers grew, might form the infants' department of a larger school. The committee had recommended that the Department should be informed that the Board proposed to continue the temporary buildings on the site for a further period in order to see how the district would develop. At a subsequent meeting of the Board, Mr. Stanley's resolution was rescinded, and the committee's proposal adopted, permission being asked to withdraw the previous letter on the subject. The Education Department have now addressed a letter to the Board in which they state that their lordships regarded the letter of December 8, which announced that the Board had decided to build at once upon the Bailey's Lane site a school for 400 children, as the settlement of the long correspondence which had taken place upon this subject, and as meeting the immediate requirements of the district, while reserving to the Board the opportunity of waiting to see how the district should develop before being committed as to the size of the larger school. Their lordships say that they are unable to consent to the withdrawal of the letter, and remind the Board that it is the statutory duty of the Board to provide school accommodation for the children who are resident in Hackney in the neighbourhood of this site, and that they are of opinion that any further postponement of the performance of this duty would be inconsistent with the terms of the undertaking given in the Board's letter of November 1, 1892, in which it was stated that "the question whether it will be necessary to build the permanent school for more than 300 is now under consideration, and so soon as it shall have been settled the school will be planned and tenders obtained for its erection." Their lordships point out that the Bailey's Lane School has been projected since 1887, and that the Board has been in possession of the land since 1890, while the necessity of the school has been proved by the fact that the temporary iron buildings are unable to accommodate all the children who required admission. After stating that it appears to be clear that the school is required for the

Hackney children, they call attention to the fact that, in this case, not only have the Board received repeated reminders from the Department of the necessity of proceeding with the Bailey's Lane School, but that on August 17, 1893, notice was sent to the Board that no further grants would be paid to the school in its temporary premises unless their lordships were satisfied that the Board were proceeding with due despatch to provide permanent buildings. They request the Board to take the matter into consideration at their early convenience.

INSTITUTION OF CIVIL ENGINEERS.

At the meeting of this Institution last week Mr. Alfred Giles, president, in the chair, a paper entitled "Tunnels on the Dore and Chinley Railway," by the late Mr. Percy Rickard, M. Inst. C.E., was read.

In 1888 the Midland Railway Company acquired powers which had been granted to an independent company for the construction of a line between Dore and Chinley over nearly the same route as a railway projected about sixty years before. The works were of an exceptionally heavy character and included the Totley Tunnel, $3\frac{1}{2}$ miles long, and the Cowburn Tunnel, over 2 miles long, which formed the subject of the paper. There was also a short tunnel of 90 yards, presenting unusual features.

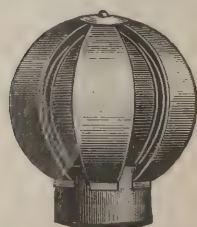
Dealing first with the Totley Tunnel, the author described the measures taken to secure the accurate setting-out of the centre line. The line having been fixed with as much precision as could be obtained with a 6-inch theodolite, observatories were built at the extreme stations and at each end of the changes of the ground-surface over the tunnel; two other observatories were also placed outside the tunnel beyond the western (Padley) entrance. These structures were built hollow, of brick in cement, and capped with stone, the ground-section being that of a cross with double arms. A transit-instrument of the fixed type, with a 3-inch object glass, was used for the observations. The arrangements for taking the sights were described in detail. Great inconvenience was experienced at the outset in finding favourable weather for fixing the line upon the terminal stations. The only times when the weather answered the necessary requirements were rare occasions in the spring and autumn, between the abatement of a high wind and a fall of rain; and as these could not be predicted and a day's preparation was necessary much time was wasted. The

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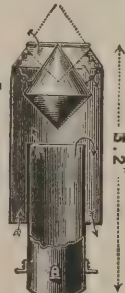
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greatest difficulty was found in sighting across the Derwent Valley westwards. After the centre-line had been fixed upon the observatories at the surface, the positions of the four shafts at Totley were set out from them; and when the shafts had been sunk the centre-line for the headings was transferred below in the ordinary way by weighted wires suspended from the top—the lines being produced underground until the headings met between the shafts.

The constructive works were next referred to. The size of the heading throughout was 10 feet by 9 feet, clear of timber—large enough to take a fully-loaded waggon—and it was driven at the formation-level or thereabouts. A commencement was made at Padley on September 27, 1888, the first 530 yards being driven by hand-power only. Great and continual difficulty was encountered at both headings from the influx of water. Up to September 1889 all the water was got rid of by lifting at shaft A; the volume amounted to 2,250,000 gallons a day. Subsequently elaborate drainage-arrangements had to be employed. In November 1891, when the Padley heading had advanced to 1,880 yards, a natural reservoir was tapped, and the water, rushing down the heading, was impounded where the level dipped, and eventually cut off all access to the face. The volume discharged by the shoot was ascertained to be 5,000 gallons per minute. Driving was resumed on February 26, 1892. With regard to the hindrances caused by the unexpected amount of water tapped at Padley, the author remarked that the best means of drainage during construction was a spacious grip in the centre of the heading, covered with timber and therefore easily accessible; that the heading should not be carried below the formation unless the tunnel were inverted; and that the drainage of the foundation of the lengths of lining was best obtained, in cases where there was much water, by the employment of compressed-air pumps.

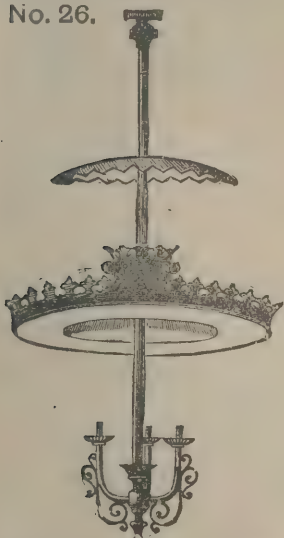
The whole of the headings, with the exception of 880 yards at Totley and 530 yards at Padley, were driven by means of compressed-air drills. Compressed air was also mainly used for ventilation. The plant, consisting of Schram and Larmuth rock-drills and Fowler air-compressors, was fully described. Gelignite was the only explosive used, and as the progress of the headings was of so much importance, no limit was set to the quantity that might be used by the miners. This was excessive, the holes being generally one-half or two-thirds filled. The total amount used in the tunnel was 163 tons. Until the headings met the ventilation beyond No. 4 shaft from Totley depended entirely upon air supplied by the compressors. In

addition to the exhaust from the machines, 2-inch ventilating pipes discharged air from the main in each break-up. Each of the 18-inch Schram compressors discharged 450 cubic feet per minute, whilst the 4-foot compressor, subsequently employed to replace one of these, discharged 2,000 cubic feet per minute. The smallest allowance per man, between April 1891 and January 1892, was under 300 cubic feet per hour. At Padley the ventilation was generally good, the large quantity of water streaming from the roof dissolving the exhaled carbonic acid and other soluble gases. The progress of this heading was, however, frequently stopped by the discharge of impure air into the workings during certain periods synchronising with every fall of the barometer.

The tunnel was lined with brickwork throughout except for 1,940 yards from the Padley entrance, where the side walls were of block-in-course masonry. The mortar was of lias lime where the ground was dry and of Portland cement where there was water. The thickness of the masonry side-walls through rock which was much jointed was 1 foot 9 inches, through shale, 2 feet; and in heavy ground, 2 feet 3 inches. The brickwork side-walls were of the same thickness as the arch, namely, 1 foot 6 inches through rock, 1 foot 10½ inches through shale, and 2 feet 3 inches in heavy ground. There were 434 yards of invert near the Totley entrance and 356 yards at the Padley entrance, the invert being of brickwork 1 foot 6 inches in thickness. Old English bond was used throughout. For the convenience of the platelayers small manholes were built at every chain on alternate sides of the tunnel and large manholes, 10 feet each way, at every half-mile. A 2-feet 9-inch culvert of brickwork in cement was built under the 6-feet way and extended 2,112 yards from the Totley entrance and 1,920 yards from the Padley entrance. An 18-inch glazed and socketed drain-pipe, bedded half-way in cement concrete, laid with open joints and covered with rubble, was laid for the remaining distance. As the opening of the whole line from Dore to Chinley depended upon the time occupied in the construction of the Totley tunnel, it was of the utmost importance that it should be constructed in the shortest possible time. The last length of lining was keyed on August 4, 1893, and the tunnel was completed and the permanent way laid by September 2 following.

The Cowburn tunnel was next described. This was 3,702 yards long and was straight from end to end. It cut the axis of the arm of the peak known as Cowburn at right angles. The gradient rose from the Edale entrance at an inclination

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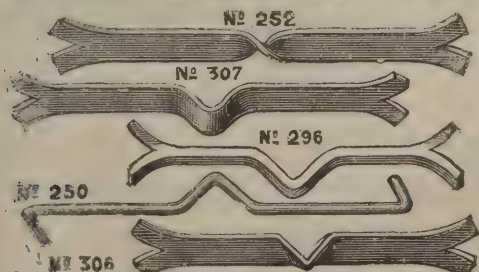
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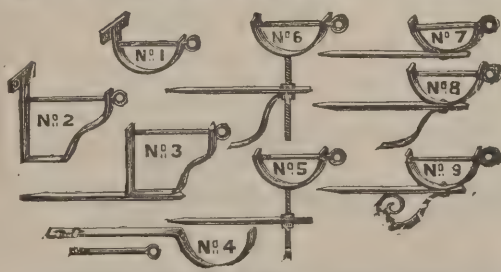
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of 1 in 1,000 for the first 913 yards and fell to the Chinley entrance at the rate of 1 in 150, the difference in level between the two ends being 53 feet. The methods of construction followed were generally the same as for the longer tunnel, but owing to the ground rising steeply at each end there was only one permanent shaft, which was situated at 335 yards from the Edale entrance. A temporary shaft was sunk at the east entrance. In sinking the temporary shaft successive beds of shale and rock were passed through, which brought in large volumes of water, the amount discharged by the pumps reaching over 20,000 gallons per hour. The strata through which the permanent shaft was sunk yielded 24,000 gallons per hour.

A commencement was made with the heading at Chinley on November 26, 1888, the material pierced being rock. The boring plant and air-compressors were fully described. Lar-muth drills were used, and towards the end of the work an improved pattern was supplied which rectified several inconveniences in those first employed. The cross-section and the construction of the lining of the Cowburn tunnel were in all respects similar to those of the larger work at Totley, but the less volume of water met with favoured the construction of the lining in a more systematic manner than at Totley. The ventilation of the workings was also improved. Owing to the difficulty of access to the Edale Valley little was attempted with the lining there until the headings met. This allowed greater opportunity for pushing forward the heading from that end, whilst at the Chinley end the progress of the heading suffered to some extent through the vigour with which the lining was pushed forward. The last length of lining was keyed on December 22, 1892.

The four-chain tunnel at the Dore end of the line was briefly alluded to. It possessed the peculiarity that it passed under very steep sidelong ground at no great depth, and was on a curve of 12 chains radius. In order to allow for the necessary cant of the vehicles on so sharp a curve, and at the same time to enable the tunnel to sustain the unequal load imposed upon it, the cross-section was inclined from the vertical towards the inside of the curve to fit the super-elevation of the outer rails of the permanent way.

The paper concluded with some remarks on the possibility of an increased rate of progress in the construction of tunnels, the author being of opinion that such increase, if possible, would result rather from improved means of removing the refuse from the tunnel-face than from increased speed of boring. In the Totley tunnel the most careful organisation for the

marshalling of waggons was required, and it was only by vigilant care that a sufficient number could be worked in, filled and worked out again in the six hours allowed, whilst the slightest accident caused much delay. The author believed that the use of much larger waggons than those generally employed would be advantageous. They should be made with the body set low and capable of being lifted off the wheels to be tipped. In conjunction with these waggons overhead travelling-skips could be employed, suspended from carriers running on light iron rails attached to the head-trees. These skips could be filled from the top of the heap of *débris* and would, after passing over the first waggon, discharge their contents into the second one.

THE LANDSLIP AT SANDGATE.

A DOVER correspondent of the *Times* writes:—Advantage has been taken of the fine weather to take some temporary precautions to prevent further disaster to the sea wall at Sandgate, which in its present condition is threatened with almost certain further destruction should another south-westerly gale set in. Trenches are being dug at the foot of the damaged wall, and these will be filled with concrete. An inspection of the damage shows that the shingle on the foreshore has been scoured out so as completely to expose the foot of the wall to the action of the sea. The mischief appears to have arisen through the wall being built upon the clay soil beneath the shingle, over which the superincumbent weight has apparently slipped. Sandgate is in a peculiar position with regard to the heavy cost of maintaining the sea-defences. The County Council are responsible for the road as a high road, but they disclaim any responsibility for the foundations of the road, of which they contend that the sea wall forms a part. The Sandgate Local Board, which represents only a small community, claims from the Council the cost of erecting the wall—3,000l.—and the matter, which has been remitted to arbitration, has been delayed from time to time. In the meantime the present serious disaster has happened to the sea wall, the whole of which will almost certainly be carried away, and the road, too, if something is not done very quickly. There is a strong feeling in the town that the question should be forced to a settlement by the wall being left as it is. A meeting of the inhabitants is to be called to discuss the matter. The work of land-surface drainage, rendered necessary by the disastrous landslip of last March, has now been completed.

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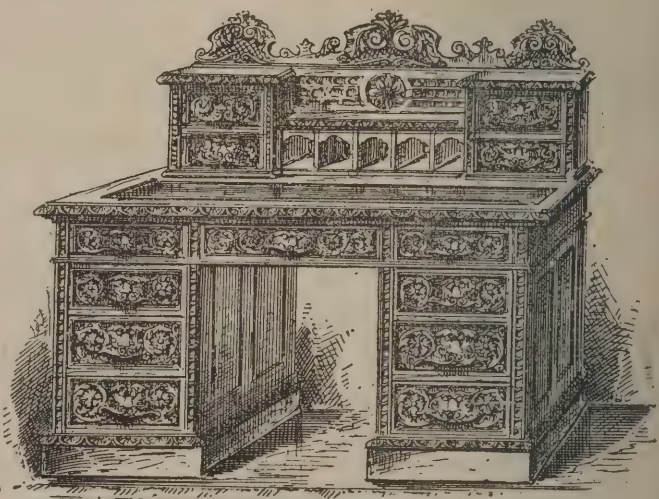
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We give an engraving of the beautiful county memorial which has been given by public subscription to the memory of the late Right Hon. the Earl of Lichfield. The engraving, however, could not convey an adequate idea of the memorial in simple black and white, and we must trust to a short description to give a better idea of the memorial. First of all, in regard of dimensions, it is 5 feet 6 inches by 3 feet 8 inches, and it consists of a brass tablet, 4 feet 6 inches by 2 feet 8 inches, emblazoned with arms, coronet and supporters, and engraved with a suitable inscription, the whole being inserted in a 6-inch border of alabaster, richly moulded and carved with oakleaves and acorns. The work was designed and executed by Messrs. Matthews & Co., 19 Castle Street East, Oxford Street, W. The dedication ceremony was performed by the Bishop of Lichfield, Bishop Anson taking part in the ceremony. Amongst those present were the Earl and Countess and



TO THE GLORY OF GOD
AND IN MEMORY OF
THOMAS GEORGE, 2ND EARL OF LICHFIELD.
BORN AUGUST 15TH 1825.
LORD LIEUTENANT OF STAFFORDSHIRE 1863-1871.
CHAIRMAN OF QUARTER SESSIONS 1859-1868.
AND AN ALDERMAN OF THE COUNTY COUNCIL FROM ITS COMMENCEMENT.

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AND SUCCESSFUL MEDIATOR, AND IN HIS DEALING WITH OTHER GREAT
SOCIAL QUESTIONS OF THE TIME HIS ZEALOUS MIND, UNSPARING LABOUR,
AND EQUITABLE JUDGMENT, WERE ACKNOWLEDGED BY ALL CLASSES OF
THE COMMUNITY.

THE MANY INSTITUTIONS WHICH OWE THEIR ORIGIN TO HIS
FORETHOUGHT ARE THE BEST AND MOST ENDURING MONUMENTS OF
HIS WISE AND COMPASSIONATE CARE OF THE SUFFERING AND HELPLESS.
HE DIED JANUARY 7TH 1892, IN THE FULL CONVICTION OF THAT
CHRISTIAN FAITH WHICH HAD BEEN THE LIGHT AND GUIDE OF HIS LIFE.

Blessed are the dead which live in the Lord, that they may rest
from their labours and their works do follow them.—Rev. xiv. 13

Dowager-Countess of Lichfield, Captain Hon. G. Anson, Dowager Lady Vernon, the Earl of Dartmouth (lord lieutenant), the Earl and Countess of Harrowby and others, all the nobility and best families of the county having been present or represented. The work as personally inspected is most meritorious and a credit to Messrs. Matthews & Co., and has been noticed by the leading journals most favourably, as it deserved to be. From the illustration it will be seen that the subject of the memorial was the second Earl of Lichfield, born in 1825 and deceased at the beginning of 1892, having reached the age of sixty-seven years. There is no doubt that he used his time, knowledge and opportunities in working to promote in every way the welfare of all alike, and was a peacemaker in disputes of any kind. It is not therefore to be wondered at that he won the affections of all in the county.

A LARGE clock has just been erected in the church at Shepton Beauchamp, Somersetshire. It has two large dials and chimes the Cambridge quarters on four bells. All the latest improvements have been introduced in the mechanism and it will doubtless keep accurate time. The whole of the work has been executed by Messrs. John Smith & Sons, Midland Clock Works, Derby, who also made the clock at St. Paul's Cathedral.

THE FUTURE CAPITAL OF BRAZIL.

A REPORT from the British Legation at Rio refers to the scheme for founding a new capital in Brazil. The third article of the Constitution provides that a territory to be selected on the central plateau of Brazil shall form a new Federal district where the future capital of the Republic shall be built. Rio de Janeiro will then become the capital of a new State, to be called Guanabara, after the original Indian name of the Bay of Rio, formed out of the present Federal district. In pursuance of this article, the Government appointed, in May, 1892, a commission, with Dr. Cruls, the director of the Rio Observatory, as president, to explore and demarcate the proposed new district. The commission proceeded by rail as far as Uberaba, in Minas Geraes, and thence on mule back to the State of Goyaz. The spot selected is in the vicinity of Pyrenopolis, formerly Meia Ponte and near the Pyreneos Mountains, on a plateau that may be said to be the watershed of Brazil. In this region are the sources of the Araguaya and Tocantins and of several large tributaries of the Francisco and Parana. The altitude of the plateau ranges from 2,950 feet to 4,260 feet, and to show how little this part of Brazil is known, it is mentioned that the highest peak of the Pyreneos Mountains, which was reputed to be 9,840 feet, was found by Dr. Cruls to be only 4,473 feet high. The climate is said to be healthy, and the average temperature is estimated at 66 deg. Fahr., which is rather less than that of Rio. Water and building stone, both granite and limestone, are found in abundance. The centre of the zone measured is 605 miles from Rio as the crow flies, but allowing for inevitable detours this would be increased to 745 miles; and Dr. Cruls takes a very sanguine view in estimating that this distance could be effected in twenty hours, at the rate of 37 miles an hour. This line, and many others, would have to be constructed in order to render it possible to govern Brazil from the wilds of Goyaz, though this may perhaps be used as an argument in favour of the project. The President's message to Congress last year urged the removal of the capital provisionally to some place in the interior, without waiting till the new capital is ready for occupation. In any case, there is no doubt that Rio will always remain from its unrivalled situation the most important city in Brazil, whether it ceases to be the capital or not. The Exploration Commission at least amassed valuable information as to the geography and botany of a region which has been visited by few travellers excepting MM. de Saint-Hilaire and Castelnau.

DRY ROT IN THE TOWER.

A REMARKABLE instance of the growth of dry rot has, says the *Kew Bulletin*, recently been discovered in the armoury of the Tower of London. In November a communication was made to the Royal Gardens from the Horse Guards, War Office, to the effect that on repairing one of the wooden horses in the armoury, believed to be more than 100 years old, a mass of fungus was found in the interior. It was cut out with the portion of wood to which it was attached and sent to Kew, when it proved to be a large and characteristic specimen of the ordinary dry-rot fungus (*Merulius lacrymans*, Jacq.). This fungus, as is well known, is very destructive to timber in close and ill-ventilated situations. The singular circumstance in this case is that it appears to have been arrested in its growth and killed and desiccated before it had produced the smallest fragment of fructification.

WHITE-LEAD SUBSTITUTES.*

THE question of how far white-lead can be replaced as a pigment by other white paints is attracting a good deal of attention at present, on account of a desire on the part of the public to obtain an article which will not entail the suffering from lead-poisoning which accompanies the manufacture of the ordinary pigment. This interest has been especially excited by the publication of Dr. Arlidge's work on "The Diseases of Occupations;" by Dr. Oliver's recent work on "Lead-Poisoning;" and by the "Report of the Home Office Committee on White-Lead Manufactures." The subject is one in which I have taken considerable interest, and have made a few experiments, which I propose to lay before you to-night.

As far as I am aware, there are only two substances at present manufactured which can be regarded as white-lead substitutes—sulphate of lead and oxide of zinc. Sulphate of barium has hardly any covering power, and sulphide of zinc, though remarkable for covering power, has not proved, I am given to understand, a durable pigment, and therefore need not be considered. I have not, however, myself experimented on sulphide of zinc, and would gladly do so with samples from a reliable maker.

* A paper read by Mr. A. P. Laurie, M.A., at the meeting of the Society of Arts.

Oxide of zinc has already obtained an assured position, and is used to some extent in this country, and largely, I believe, in France and in Japan. Its properties as a pigment are fairly well known. It is deficient in covering power, but is remarkably white, and preserves its colour in impure air.

Sulphate of lead is, I believe, at present in the market in two forms—sublimated sulphate, prepared by the Caledonia Works, Glasgow, and precipitated sulphate, ground by Freeman's patent with oxide of zinc, and sold as Freeman's white. The sublimated sulphate is prepared directly from galena. More than one patent for doing this has been taken out, but I believe it is now only being made by the Glasgow White-Lead Company, according to Mr. Hannay's patents. Sulphate of lead prepared by sublimation has much more covering power and is much denser than precipitated sulphate. At the same time, I believe it is difficult to obtain a complete yield of sulphate from the galena, which is of a good white, and not a little grey. This difficulty may, however, have been got over recently. Freeman's sulphate is prepared by dissolving lead, which has been converted into thin flakes, in acetic acid, and precipitating with sulphuric acid. This is washed, pressed and dried. Alone its covering power is poor. It is then ground with about 20 per cent. of oxide of zinc and a little barium sulphate, under heavy edge-runners. The result is a pigment of much greater density and covering power than either of its constituents. There is another pigment being sold as a harmless white-lead by the Patent Lead and Zinc White Company, which is prepared in a similar way by grinding together oxide of zinc and sulphate of barium. This process is based, I believe, on an abandoned patent by Mr. Freeman for preparing condensed oxide of zinc by grinding oxide of zinc under heavy edge-runners.

The following samples illustrate the reduction in bulk of the powder produced:—

1. By grinding together the zinc oxide and precipitated lead sulphate.

2. By grinding zinc oxide alone.

The reduction is very remarkable, and suggests an interesting problem in molecular physics. Mr. Freeman has supplied me with some interesting facts about the results of grinding these substances dry under heavy edge-runners. Before grinding the mixed oxide and sulphate weighs 120 lbs. to the cubic foot, and takes 12 lbs. of oil to the hundredweight. After grinding it weighs 199 lbs. to the cubic foot, and takes 7 lbs. of oil to the hundredweight. A comparison of the pro-

perties of some of these pigments with ordinary white-lead reveals some interesting results.

In the first place, with reference to the quantities of oil required to grind these pigments—

One cwt. of	Takes lbs. of oil.
White-lead (stack process)	9
White-lead (precipitated)	12
The Glasgow lead sulphate	12
Zinc oxide	25
Zinc oxide (condensed)	16
Freeman's white	7

It will be noticed that, in the quantity of oil required, these white-lead substitutes compare well with white-lead, some taking a little more and some a little less, except oxide of zinc, which takes a very large quantity.

In the second place, with reference to their susceptibility to impure air.

Here all these substitutes have a distinct advantage over white-lead, for the zinc oxide is quite unaffected, and the sulphate is very slightly affected, unless the gas is in very large quantities and the paint wet. This panel shows distinctly the difference between white-lead and Freeman's white in this respect. It was exposed to sulphuretted hydrogen some time ago, and the white-lead has to some extent recovered, being almost black at first.

It is a matter of surprise that these whites are not universally used in place of white-lead for internal work in London, where white-lead discolours so quickly. I am sure the general public would insist upon it if they knew how much it would save them in cost of painting.

The most important question is covering power. Oxide of zinc, prepared in the usual way, is of course distinctly inferior to white-lead, but I could not find any proof that special preparations of lead sulphate and zinc oxide were also deficient. In fact, Professor Church, in his book on "Pigments," distinctly states that Freeman's white has about the same covering power as white-lead. I tested the covering power of these pigments in the following way:—

The outside of my laboratory is covered with weather boarding, which has had two or three coats of white-lead. I selected a certain number of boards and painted black strips down them at equal distances apart, so as to count the surface into alternate black and white strips 3 inches broad. Each board was 6 inches broad, and I covered 10 feet in this way, so that each board represented a surface of 5 square feet. I



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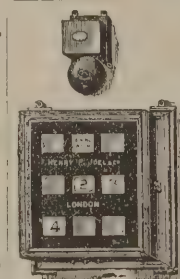
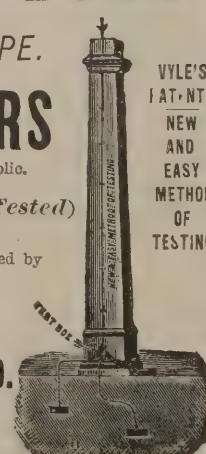
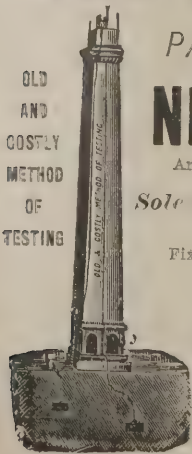
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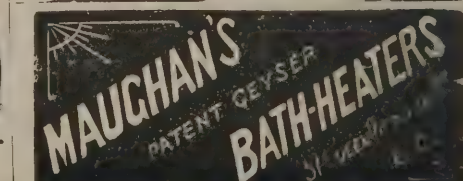
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next took equal weights of the best stack lead, of the Glasgow sulphate, and of Freeman's white, as sent out ground in oil by their respective makers.

I next employed a skilled house-painter, who added thinning, made of equal parts of oil and turps. He added the oil and turps until satisfied with the consistency of the paint. In each case 200 grammes of the paint was taken. The thinnings weighed respectively—

	Grammes.	Thinning	Grammes.
White-lead	200	..	41
Freeman's white	200	..	39
Glasgow white	200	..	45

He then painted in a coat of each paint along the board. The coats weighed respectively—

	Freeman's white.	Glasgow white.	White-lead.
First coat	30	28	33
Second coat	30	28	36
Third coat	43	28	40

The black checks had very nearly disappeared from white-lead and Freeman's white.

Fourth coat	53
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The checks had now disappeared completely from the Glasgow white. This last coat was laid on by an unpractised hand, and was consequently unnecessarily thick. Another coat of 28 grammes would have been sufficient.

Consequently, the weight of paint used is in every case practically the same. The black checks were very faintly visible under the white lead; slightly more so in the case of Freeman's white; they were quite invisible for the Glasgow white.

The Glasgow sulphate, however, required four coats, each weighing less than a coat of the other pigment. The extra thinning added will not entirely account for this, and it is probably due to the extra amount of oil with which the colour is ground. Doubtless this slight defect in the sample sent to me can be overcome.

The next question of interest is the durability of the coating formed by these pigments for outdoor work. I have not had sufficient time to test this question properly. I made a rough experiment, by sizing a piece of canvas, and painting one-half with white-lead and the other half with Freeman's white, and hanging it up out of doors to flap in the wind. After six months they were both badly cracked, but one seemed no worse than the other. I presented the canvas to the White-Lead Com-

mittee. Oxide of zinc is supposed not to stand exposure so well as white-lead, and probably as it has been long in use this opinion is correct. About the durability of the whiteness there can be no question. This painting was done last June; I washed it a few days ago, and then examined it carefully. The white-lead is a dirty grey. The Glasgow white and Freeman's white have kept their colour well. The Glasgow white is covered with minute cracks, and the Freeman's white has grown slightly translucent.

Since these experiments, I have tested the covering power of condensed zinc oxide; 100 grammes of the paint took 32 grammes of thinning. Three coats weighed 25, 22, 25 grammes. The black marks were then just vanishing, so that this pigment gave the best results of all.

Next we come to the working qualities of these pigments and their consistency in oil. Their appearance in oil differs considerably from that of white-lead, being thin and stringy instead of stiff and firm; and I have no doubt this is against them. I do not find, however, that when thinned down they seem to differ appreciably from lead carbonate in ease of working. I cannot, however, pretend to speak authoritatively in this matter, but I can speak on the question of their suitability for artists' use.

I may say at once that, as sent out by the different makers, I found them quite unsuitable. An artist expects his colour to squeeze out from the tube crisp and firm, and to work with perfect ease under the brush without running. As I was anxious to introduce them to artists, I cast about for some way to get over this difficulty, and, finally, devised one which I propose shortly to describe. It is generally understood that white-lead owes its peculiar properties partly to the fact that it saponifies with the oil. This has, I am aware, been disputed by Mr. Hannay, but I have assumed the exactness of this belief in making my experiments.

Evidently, so stable a compound as lead sulphate could hardly be expected to saponify with the oil, but it seemed to me quite possible that oxide of zinc would do so. I therefore treated some oxide of zinc ground in oil with light petroleum spirit, and found that besides dissolving the oil, the petroleum spirit had dissolved a very small quantity of zinc (.02 per cent.), which showed that a zinc soap was present, but in very minute quantities. Evidently, then, the zinc oxide was not able to decompose the glycerine fatty acid compounds. On the other hand, if zinc oxide is ground with free fatty acid it combines to form a soap (oleic or linoleic). I therefore tried the effect of

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adding small quantities of linoleic and oleic acid to the oil in which the oxide of zinc was ground. I found this at once acted in a remarkable manner, converting the thin mixture into a stiff mass, closely resembling white-lead. The free fatty acid acted in a similar manner on Freeman's white, so as to convert it into a stiff mass, which completely deceived house-painters who had long been familiar with white-lead. On treating this pigment with petroleum spirit, I dissolved out a considerable quantity of zinc soap. By adding more oil I obtained all the requirements in consistency and ease of working necessary for the artist. This method of grinding zinc oxide, which I have protected by patent, is I believe well worth trial on the large scale for ordinary purposes.

There is still a further matter which I have not touched on, and that is how far these pigments are non-poisonous.

Oxide of zinc is, I believe, quite harmless. Sulphide of lead is not absolutely insoluble in very weak hydrochloric acid. On three occasions I digested well-washed precipitated lead sulphate in '3 per cent. hydrochloric acid at 100 degrees Fahr. for three hours, in this way roughly representing the action of the stomach, though, of course, with rather stronger acid (the hydrochloric acid in the stomach is about '02). In each case I digested 1 gramme with 50 cc. of the '3 per cent. hydrochloric acid. I found—

- | | | |
|-----|-------|------------------------------|
| (1) | '0072 | grammes of lead in solution. |
| (2) | '0121 | " " " |
| (3) | '0090 | " " " |

'0283 giving a mean = '0094.

of lead dissolved in each case, showing that about 1 per cent. is dissolved under these conditions. Probably, therefore, sulphate of lead is slightly soluble in the stomach, and therefore to some extent poisonous. I do not, however, believe that, under ordinary conditions of manufacture or use, lead sulphate would produce lead poisoning, nor would one or two doses swallowed do any harm. Nothing but repeated doses in considerable quantity would probably produce lead poisoning, and this does not happen under ordinary circumstances.

In conclusion, I should like to point out that this question of white-lead substitutes is part of a very large subject, namely, how we can render our various industrial processes harmless to those employed. For this century, our scientific knowledge and inventive genius have been devoted to increasing the rate of production and cheapening the article produced. I hope the time is now coming when our scientific knowledge and

inventive power will be directed into a new channel, and will be devoted to rendering our manufacturing processes, of whatever kind, healthy for those employed.

As a step in that direction, I venture to suggest that the Society of Arts might well take up such questions, and by special inquiries promote the introduction of harmless substitutes and better processes. This question, for instance, of white-lead substitutes is ripe for a special inquiry by some body of recognised standing.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

849. George Mewburn Stonehouse and Thomas Richardson White, for "Boiler and other flue cleaners."

889. Edward Francis Hutchins, for "An improved ventilating apparatus for window-sashes."

904. Wladimir Khlebuikoff, for "Improvements in smoke-consuming furnaces."

933. George Rose, for "Improvements in apparatus for extinguishing fires and for other purposes."

942. John Stow, for "Improvements in the construction of door and other similar bolts."

995. Teile Henry Müller, for "Improvements in furnace grates."

1047. Henry Birkbeck, for "Improvements in or in connection with collapsible doors."

1176. Thomas Joyce, for "Improvements in water-pipes."

1209. Alfred Carey, for "A new or improved chimney cowl."

1304. Walter Judd, for "Improvements in means for preventing water-pipes bursting from frost."

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COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb. 28.—For Scheme of Water Supply and Sewerage. Premium of 40% is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150% and 50%, premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ALMONDBURY.—Feb. 15.—For Building Dwelling-house. Messrs. John Kirk & Sons, Architects, Huddersfield.

ANTRIM.—March 5.—For Building Lunatic Asylum at Holywell. Mr. J. Lanyon, Architect, Northern Bank Chambers, Royal Avenue, Belfast.

ARMLEY.—Feb. 17.—For Alterations to Town Schools. Mr. C. F. Wilkinson, Architect, 35 Park Square, Leeds.

BARKEREND.—Feb. 9.—For Building Residence and Stabling. Mr. James Ledingham, Architect, District Bank Chambers, Bradford.

BATTERSEA.—Feb. 14.—For the Supply of Alderney Granite, Cornish and Enderby Stone, Oils, Paint, the Removal of Road Grit, &c. Mr. W. Marcus Williams, Vestry Offices, Battersea Rise.

BATLEY CARR.—Feb. 16.—For Building Six Dwelling-houses. Messrs. P. Spencer & Son, Architects, Batley Carr.

BEDWAS.—Feb. 17.—For Building Board School and Additions to Bridge School. Mr. Evan Davies, Architect, Maescymmer.

BELFAST.—Feb. 14.—For Building Four Houses and Shops. Mr. F. W. Lockwood, Architect, 16 Waring Street, Belfast.

BELFAST.—Feb. 15.—For Building Church. Mr. Samuel P. Close, Architect, 53 Waring Street, Belfast.

BELFAST.—For Building Nelson Memorial Church. Mr. W. H. Stephens, 41 Donegall Place, Belfast.

BENTLEY.—Feb. 10.—For Additions to Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

BIRKENHEAD.—Feb. 19.—For Boundary and Retaining Walls, &c., for Refuse Destructor Site. Mr. C. Brownridge, Borough Engineer.

BRADFORD.—Feb. 10.—For Building Two Wool Warehouses. Messrs. Brayshaw & Dixon, Architects, Bowling Old Lane, Bradford.

BRADFORD.—Feb. 19.—For Building Business Premises. Messrs. Empsall & Clarkson, Architects, Tyrrel Chambers, Bradford.

BRADFORD.—Feb. 19.—For Building Store and Two Houses. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

BRIDGEND.—Feb. 9.—For Building Vicarage, Ogmore Vale. Messrs. Halliday & Anderson, Architects, 13 Duke Street, Cardiff.

BRISTOL.—Feb. 12.—For Additions to Premises, Lloyds Bank. Mr. H. Williams, Architect, 28 Clare Street, Bristol.

BURSLEM.—Feb. 21.—Additions and Alterations at Chell Workhouse. Messrs. Ford & Slater and Mr. Walley, Joint Architects, Burslem.

CARDIFF.—Feb. 10.—For Building Male Nurses' Rooms at Workhouse. Mr. E. Seward, Architect, Queen's Chambers, Cardiff.

CARLISLE.—Feb. 14.—For Additions to Court Houses. Mr. G. D. Oliver, County Architect, The Courts, Carlisle.

CHICHESTER.—Feb. 21.—For Additions to Workhouse and Works of Drainage and Water Supply. Messrs. Inkpen & Swinburne, South Street, Chichester.

CHORLEY.—Feb. 20.—For Building Wesleyan Chapel. Mr. W. H. Dinsley, Architect, 20 High Street, Chorley.

CRADLEY.—Feb. 9.—For Building Police Station, Cells, &c. Mr. Henry Rowe, County Surveyor, Worcester.

CROSSGAR.—Feb. 9.—For Additions to House. Mr. Robert Watt, Architect, 77A Victoria Street, Belfast.

CYMMER.—Feb. 14.—For Building Baptist Chapel. Mr. H. Abraham, Porth, Pontypridd.

DEWSBURY.—Feb. 9.—For Building Two Semi-detached Houses. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DORCHESTER.—Feb. 9.—For Repairs to Premises, High West Street, for the Joint Committee of the County of Dorset. The County Architect, Shire Hall, Dorchester.

ERITH.—Feb. 12.—For Building Cemetery Chapels, House, &c. Mr. F. Parish, Clerk to the Local Board, High Street, Erith, Kent.

FAREHAM.—Feb. 26.—For Building Block for Fifty Children at County Lunatic Asylum. Mr. B. S. Jacobs, Architect, Lincoln's Inn Buildings, Hull, and 88 Bishopsgate Street, E.C.

FULHAM.—Feb. 14.—For Making-up and Paving Munster Road. Mr. J. P. Norrington, M.I.C.E., Town Hall, Walham Green, W.

GLOSSOP.—For Additions to Friendship Inn. Mr. J. H. Burton, Architect, Wellington Street, Ashton-under-Lyne.

GREENFIELD.—Feb. 14.—For Building House near Reservoir. Messrs. John Eaton & Sons, Architects, Stamford Street, Ashton-under-Lyne.

HALIFAX.—Feb. 10.—For Additions to Higher Grade Board School and other Works. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HAMMERSMITH.—For the Supply of Materials and Execution of Works for a Period of Twelve Months. Mr. W. P. Cockburn, Vestry Hall, Broadway, Hammersmith.

KENDAL.—Feb. 10.—For Building Mission Room. Mr. Stephen Shaw, Architect, Kendal.

KEYNSHAM.—For the Erection of Schools. Mr. E. H. Lingen Barker, 146 St. Owen's Street, Hereford.

LEEDS.—Feb. 12.—For Extension of Electric Lighting Station. Messrs. Milnes & France, Architects, Bradford.

LEEDS.—Feb. 19.—For Building Public Baths. Mr. Walter Hanstock, Architect, Branch Road, Batley.

LIMEHOUSE.—Feb. 19.—For General Works and Repairs to Foot and Carriage Ways, Sewers, Drains, &c., and the Supply of Broken Guernsey Granite, for a Period of One or Two Years. Mr. Sidney G. Ratcliffe, District Board Offices, White Horse Street, E.

MALDON.—Feb. 9.—For Building Villa. Mr. P. M. Beaumont, Architect, Maldon.

MONMOUTH.—For the Erection of Twelve Cottages and the Completion of Nine Others at Abertillery, near Newport. Messrs. Bishop & Pritchett, Regent's Circus, Swindon, Wilts.

MOSS SIDE.—Feb. 12.—For Building Board School, House and Board Offices. Messrs. Potts, Son & Pickup, Architects, 34 Victoria Buildings, Victoria Street, Manchester.

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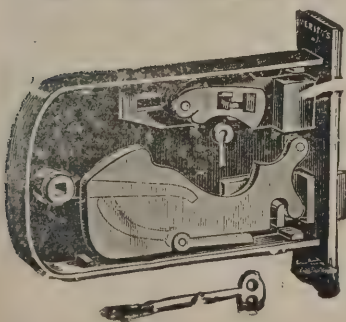
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NORTHOWRAM.—Feb. 13.—For Building Board School for Infants at Ambler Thorn. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

PENYRHROEL.—Feb. 12.—For Building Eighty Houses. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

RYDE.—Feb. 10.—For Enlarging Pierhead, Erecting Pavilion, &c. Mr. R. St. George Moore, Engineer, 17 Victoria Street, Westminster.

ST. SAVIOUR'S.—Feb. 13.—For the Supply for One Year of Thames Ballast and Sand. Mr. W. H. Atkins, Emerson Street, Southwark.

STAFFORD.—Feb. 15.—For Works at County Asylum. Mr. W. H. Cheadle, County Surveyor, Stafford.

WEST HAM.—Feb. 20.—For the Construction of 1,000 Feet of Roads and Sewers. Mr. C. W. Carrell, Clerk to Local Board, Broadway, Stratford.

TENDERS.

ALNWICK.

For Alterations and Additions to Star Hotel, for Mr. G. S. Smart. Mr. GEO. REAVELL, jun., Architect, Alnwick.

Accepted Tenders.

J. Short & Son, Alnwick, joiner	£97 15 0
W. Weatheritt, Alnwick, mason	84 17 6
W. Dixon, Alnwick, plasterer	27 13 7
W. Dixon, Alnwick, slater	20 15 0
Wilkin & Dickman, Alnwick, plumber	14 10 0
J. Percy, Alnwick, painter	5 2 6

ALVERSTOKE.

For Wards and other Additions to the Alverstone Union. Mr. HARRY A. F. SMITH, Architect, Star Chambers, Gosport.

J. W. M. Rapley & Son	£1,400 0 0
J. Crockerell	1,300 0 0
Lear & Son	1,283 0 0
Lane & Son	1,249 0 0
J. Dugan	1,200 0 0
J. Croad	1,200 0 0
C. M. DASH (accepted)	1,189 0 0

AMERSHAM.

For New Boiler-house and Alterations to Scullery, for the Guardians.

G. Darlington, Amersham	£240 0 0
Free & Co., High Wycombe (accepted)	175 0 0
A., F. & G. Bailey, Amersham	95 2 0

BLACKPOOL.

For Building Warehouse, Bakery, Stables, &c., for the Blackpool Industrial Co-operative Society. Messrs. GARLICK & SYKES, Architects, Market Street, Blackpool.

G. Smith & Sons, Great Marton	£4,748 17 0
S. & J. Whitehead, Blackpool	4,600 0 0
J. Swarbrick, Preston	4,530 14 0
T. H. Smith, Blackpool	4,480 0 0
T. Strickland, Preston	4,474 0 0
S. Butterworth & Sons, Blackpool	4,346 0 0
Moore Bros., Rawtenstall	4,298 0 0
R. M. Bonny, Blackpool	4,230 10 0
J. Whiteside, Blackpool	4,188 0 0
W. EAVES & CO., Blackpool (accepted)	4,177 0 0
Architect's estimate	4,483 0 0

BOURNEMOUTH.

For Kerbing, Channelling and Draining Portions of the Christchurch-Bournemouth Main Road at Pokesdown, near Bournemouth. Mr. JAMES ROBINSON, County Surveyor, 13 Southgate Street, Winchester.

Adams, Wood Green, N.	£848 0 0
Reeks, Lymington	805 13 0
James, Bournemouth	761 15 0
Stickland, Boscombe	680 1 6
Saunders & Co., Bournemouth	643 19 7
L. AYLES & SON, Ringwood (accepted)	590 0 0
Locks, Christchurch	520 0 0

BOXTED.

For Alterations to the C.E. Schools, Boxted, Essex. Mr. J. W. START, F.S.I., Architect, Cups Chambers, Colchester and Harwich.

Garwood, Clacton	£455 10 0
Beaumont, Lexden	390 0 0
Deaves, Nayland	360 0 0
SAUNDERS & SON, Didham (accepted)	345 0 0

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Patching, Brighton	256	0	0
Penfold, Brighton	243	0	0
Thorpe, Brighton	241	0	0
H. G. FISHER, King's Cross (accepted)	223	0	0

BULWELL.

For Building Board School for Infants, Bulwell. Mr. A. H. GOODALL, Architect, Nottingham. Quantities by Architect.

S. Ingham & Sons, Old Basford	£5,110	0	0
T. McCulloch, Bulwell	4,925	0	0
J. J. Adams, Nottingham	4,753	12	0
G. Hopewell & Son, Old Basford	4,662	0	0
R. Tilley, Bulwell	4,648	5	0
Dennett & Williamson, Nottingham	4,620	0	0
W. Donnelly, Kimberley	4,580	0	0
J. Hutchinson, Nottingham	4,560	0	0
J. H. Vickers, Nottingham	4,540	0	0
L. Green, Hucknall Torkard	4,490	0	0
J. F. Price, Nottingham	4,470	17	6
J. Cooper, Nottingham	4,430	0	0
J. Hodgson & Son, Nottingham	4,419	0	0
J. White, Bulwell	4,399	0	0
H. Vickers, Nottingham	4,399	0	0
Gilbert & Gabbitass, Nottingham	4,395	0	0
Appleby & Lambert, Nottingham	4,394	0	0
T. Cuthbert, Nottingham	4,380	18	0
J. Musson, Nottingham	4,365	0	0
W. Maule, Nottingham	4,364	0	0
J. Barlow, Nottingham	4,340	0	0
J. Oscroft, Nottingham	4,335	0	0
B. Keeling, Nottingham	4,330	0	0
W. Pinkett, Bulwell	4,295	0	0
G. A. PILLATT, Nottingham (accepted)	4,220	0	0

CHALTON.

For Building School and Teacher's House at Chalton, for the Toddington School Board. Mr. T. T. LAWRENCE, Architect.

James Ayres, Hockliffe	£898	0	0
A. Nash, Dunstable	819	0	0
DAVID DUNHAM, Toddington (accepted)	800	0	0

DERBY.

For Enlargement of St. James's Road Board School, for the Derby School Board. Mr. JAS. WRIGHT, Architect, Iron-gate, Derby.

Ford & Co.	£9,530	0	0
J. Parker	9,404	0	0
Walker & Slater	9,410	0	0
J. T. Tomlinson & Co.	9,365	0	0
G. Wagg	9,182	0	0
H. Chattle	8,960	9	0
A. Smith	8,894	6	0
E. Wood	8,834	11	0
H. Vernon	8,755	9	0
W. Eaton	8,687	3	0
A. BROWN (accepted)	8,576	0	0

HENLEY-IN-ARDEN.

For Building Wesleyan Chapel, Henley-in-Arden. Mr. THOS. T. ALLEN, M.S.A., Architect. Quantities by Mr. H. H. ALLEN, Swan Buildings, Edmund Street, Birmingham.

J. W. LORD, Henley-in-Arden (accepted)	£566	9	9
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KINGSTON-ON-THAMES.

For Additions to the Female Infirmary, Kingston Union.

Rochelle, Gover & Smith, Harlesden	£8,126	9	11
Yerbury & Sons, Kilburn	8,000	0	0
Turtle & Appleton, Clapham Junction	7,853	0	0
Cooke & Co., Battersea	7,617	0	0
Tompsett & Kingham, Farnham	7,236	0	0
Wall & Co., Kentish Town	7,198	0	0
Allen & Sons, Kilburn	7,125	0	0
W. H. Gaze, Kingston-on-Thames	6,980	0	0
D. Judd, Kingston-on-Thames	6,958	12	6
Oldridge & Sons, Norbiton	6,949	0	0
J. O. Richardson, Peckham	6,929	0	0
Dorey & Co., Brentford	6,871	0	0
Lane & Son, Kingston-on-Thames	6,730	0	0
Botterill & Son, Reading	6,517	0	0
LORDEN & SON, Upper Tooting (accepted)	6,487	0	0
C. Jobbins, Kingston-on-Thames	6,282	0	0
C. Jackson, Vauxhall	5,454	0	0

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H. GOODALL, Pinxton (accepted)	£739	15	0
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J. E. Brodrick & Co., Richmond	5,993	10	1
B. Cooke & Co., Battersea	5,170	6	0
W. Cunliffe, Kingston-on-Thames	5,164	13	10

KILKENNY.

For Works and Repairs at the Roman Catholic Chapel, Workhouse, Kilkenny.

Reade & Sons, Kilkenny	£147	0	0
J. MORRISEY, Kilkenny (accepted)	132	10	0

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For Construction of Baths in Kirkstall Road.

J. T. Wright, Leeds, mason and bricklayer.
Hosnell & Heald, Ossett, joiner and carpenter.
W. & C. Barraud, Leeds, plumber and glazier.
T. W. Helliwell, Brighouse, patent glazing.
E. Greenwood & Son, Halifax, fireproof flooring.
Hargreaves & Dewhurst, Bradford, ironfounder.

Robert Branton, Leeds, plasterer.

Jonas Gaunt, Wortley, painter.

T. E. Heavysides, Leeds, slater.

Thomas & Taylor, Stockport, boilers, engines, laundry machinery, &c.

Total amount, £6,865.

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For Erecting House with Stabling and Coach-house at Stoneygate, Leicester, for Mr. A. J. Ewen. Mr. JAMES RANSOME, A.R.I.B.A., Architect, 11 Argyll Place, W. Quantities by Mr. HENRY RILEY, 8 Buckingham Street, Adelphi, W.C.

S. & E. Bentley, Leicester	£1,790	0	0
H. T. & W. Chambers, Leicester	1,770	0	0
T. Bland & Son, Leicester	1,765	0	0
T. Duxbury & Son, Leicester	1,635	0	0
J. E. JOHNSON, Leicester (accepted)	1,614	0	0

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S. J. WARING & SONS (accepted)	£408	0	0

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W. Neil	£2,846	0	0	£46	0	0
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J. Grover & Son	2,197	0	0	60	0	0
W. Downs	2,110	0	0	56	0	0
E. Lawrance & Sons	1,970	0	0	50	0	0
G. S. S. Williams & Sons	1,913	0	0	53	0	0
E. Houghton & Son	1,783	0	0	45	0	0

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Calnan & Co.	1,248	0	0
E. Triggs	1,200	0	0
J. T. Robey	1,016	15	0

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W. Dabbs	3,130	0	0	65	0	0
Kilby & Gayford	3,125	0	0	61	0	0
J. Allen & Sons	3,051	0	0	25	0	0
D. Charteris	2,984	0	0	53	0	0
Foster & Dicksee	2,953	0	0	45	0	0
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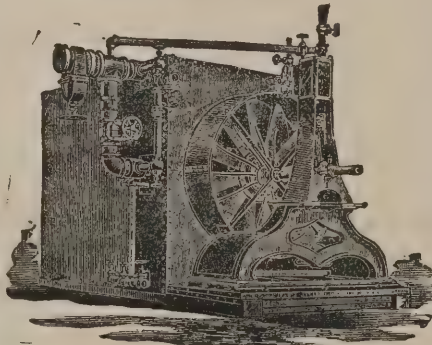
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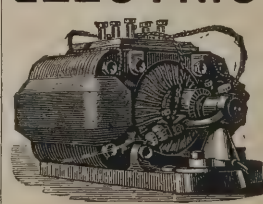
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J. Shillitoe & Son	13,142	0	0	207	0	0
W. Downs	12,899	0	0	217	0	0
B. E. Nightingale	12,597	0	0	232	0	0
Holliday & Greenwood	12,587	0	0	222	0	0
H. Lovatt	12,532	0	0	185	0	0
Hart Bros.	12,389	0	0	254	0	0
E. Lawrance & Sons	12,275	0	0	208	0	0
C. Cox	12,031	0	0	208	0	0
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J. Marsland	4,800	0	0	85	0	0
Hart Bros.	4,791	0	0	85	0	0
J. & M. Patrick	4,791	0	0	106	0	0
Holloway Bros.	4,783	0	0	85	0	0
Co-operative Builders, Limited	4,772	0	0	90	0	0
H. Lovatt	4,683	0	0	85	0	0
W. Downs	4,558	0	0	53	0	0
Stimpson & Co.	4,424	0	0	127	0	0

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G. Wimpey & Co., Hammersmith	360	0	0
H. J. Greenham, Hammersmith	355	0	0
Nowell & Robson, Kensington	337	0	0
J. Mears, Earl's Court	325	0	0
E. Parry, Walham Green	318	0	0

Paving—York.

Nowell & Robson	283	0	0
G. Wimpey & Co.	275	0	0

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Imperial Stone Company, Greenwich	216	0	0
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Acolf Road.—Roadway.

G. Wimpey & Co.	288	0	0
Nowell & Robson	287	0	0
J. Mears	265	0	0
H. J. Greenham	265	0	0
E. Parry	253	0	0
J. Ball	249	0	0

Paving—York.

Nowell & Robson	165	0	0
G. Wimpey & Co.	162	0	0

Adamant.

G. Wimpey & Co.	117	0	0
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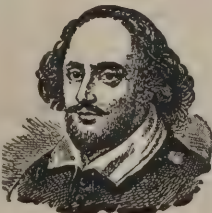
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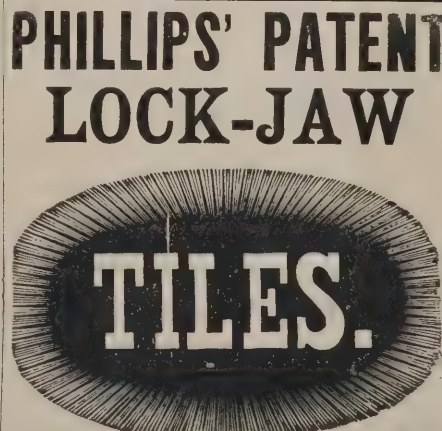
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F. Curtis	£1,196	0	0
Holliday & Greenwood	1,093	0	0
B. E. Nightingale	1,066	0	0
Lathey Bros.	1,049	0	0
F. G. Minter	967	0	0
L. Whitehead & Co.	940	0	0
W. & H. Castle	889	0	0

For Building South Norwood New Sorting Offices, for H.M. Commissioners of Works.

G. E. Bryan & Son	£2,386	0	0
W. Gibbin & Son	2,355	0	0
Young & Lonsdale	2,285	0	0
Rechelle, Gover & Smith	2,258	10	10
Balaam Bros.	2,200	0	0
J. Smith & Sons	2,197	0	0
J. H. Newman	2,115	0	0
G. H. Martin & Co.	2,043	0	0
H. E. Tomes	1,999	0	0
Amalgamated Co-operative Builders' Society	1,969	0	0
J. O. Richardson	1,939	0	0
W. H. Lorden & Son	1,913	0	0
W. Akers & Co.	1,869	0	0

MIDDLETON.

For Building Church at Middleton. Mr. G. C. ASHLIN, Architect, Dublin. Quantities by Messrs. SLEVIN & CLAYTON, 16 Dame Street, Dublin.

J. J. COFFEY (accepted)	£10,890	0	0
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NORTH CRAY.

For Extension of Sewer, North Cray, Kent, for the Bromley Rural Sanitary Authority. Messrs. A. WILLIAMS & SONS, Engineers, 18 Great George Street, Westminster.

T. Adams	£309	14	4
G. Osenton	255	17	0
J. Jackson	247	16	6
Porter & Harrison	241	5	2
Laydon & Crawford	239	0	2
Stebbings & Pannett	229	0	0
Brewer & Rackham	226	5	0

MID-KENT BUILDING AND CONTRACTING WORKS (accepted)	201	11	3
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ROTHERHAM.

For Building Twenty-nine Dwelling-houses, St. John's Road Eastwood, for Mr. William Clarke. Mr. EDWARD HUTCHINSON, Architect, 18 Howard Street, Rotherham.

Quantities by Architect.			
I. Crooks, Sheffield	£4,103	10	0
H. Scrivens, Rotherham	4,090	0	0
R. Snell, Masbrough	4,060	0	0
C. Green, Rotherham	3,980	0	0
B. Bool, Rawmarsh	3,980	0	0
W. Marshall, Rotherham	3,920	18	8
W. Bell, Rotherham	3,780	0	0
T. Green, Rotherham	3,753	0	0
R. Snell, Rotherham	3,680	0	0
A. T. Ripley, Rotherham	3,595	0	0
W. Thornton & Son, Rotherham	3,557	0	0
Architect's estimate	3,650	0	0

SURREY.

For the Erection of a Bungalow in the Parish of Horsell, for Mr. J. B. S. Lancaster, to be Heated Entirely with Gas and Lighted by Electricity. Mr. R. CLAMP, Architect, Woking.

G. Allard	£587	0	0
A. A. Gale	580	0	0
Harris & Son	563	0	0
H. Ingram, Woking*	490	0	0

* Accepted, exclusive of stoves and decorative work.

SOUTHPORT.

For the Delivery at the Highway Siding, Southport, of 300 Cast-iron Bend Pipes and Swan Necks, for the Corporation. Mr. W. CRABTREE, Borough Surveyor.

T. E. Kershaw, Nuneaton	£31	5	0
T. W. Robinson, Stourbridge	20	0	0
H. Williamson & Co., Goole	19	11	8
J. Ball, Ormskirk	19	7	0
Griffiths & Co., Southport	18	6	8
G. Smith & Co., Glasgow	18	2	6
Pryke & Palmer, London	17	5	10
S. Halton, Southport	17	1	8
Callendar Iron Company, Falkirk	15	16	8
Seddon & Blundell, Southport	14	9	6
H. J. Skelton, London	14	3	4
NEWTON, CHAMBERS & Co., Sheffield (accepted)	14	3	4

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Butters Bros. & Co., Glasgow	£566	10	0
J. W. Brooke, Lowestoft	525	0	0
J. Stones, Limited, Ulverston	413	15	0
Vaughan & Son, West Gorton	390	15	5
Bolton Engineering Co., Bolton	350	0	0
T. Smith, Old Foundry, Rodley	328	5	0
St. George's Ironworks Co., Limited, Manchester	325	0	0
J. Booth & Bros., Rodley	280	0	0
Barrington & Sainsbury, Manchester	279	5	0
T. L. Kershaw, Manchester	254	13	9
Thornton & Crebbin, Bradford*	208	7	6

* Recommended for acceptance.

STEVENTON.

For Building School and Teacher's Residence, for the Steventon School Board. Mr. J. GIBSON, Architect, Basingstoke.

Weeks, Whitchurch	£1,470	0	0
Simonds, Reading	1,385	0	0
Tarrant, Basingstoke	1,320	0	0
Beale, Andover	1,290	0	0
Kellow & Smith, Salisbury	1,285	0	0
Sims, Basingstoke	1,260	0	0
Goodall, Basingstoke	1,260	8	8
Harris, Basingstoke	1,208	5	0
Annett & Son, Andover	1,195	0	0
Thumwood, Basingstoke	1,151	17	0
Mussellwhite & Son, Basingstoke	1,129	0	0
WYETH, Oakley (accepted)	1,050	0	0

SWANSEA.

For New Street and Back Lane on the Mirador Field, Uplands. Messrs. JOHN M. LEEDER & SON, Surveyors, Goat Street, Swansea.

J. & F. Weaver	£453	10	0
P. Jones & Sons	450	0	0
J. Williams	428	0	0
T. J. Davies	400	0	0
W. James	354	7	6
C. Hanney & Son	335	5	0
J. Grove	310	0	0

STROOD.

For Supply of Convertible (Iron and Deal) Tables and Benches for the Dining-hall, for the Guardians of Strood Union. Mr. GEORGE E. BOND, Architect, Rochester.

C. E. Orfeur, Colchester	£120	0	0
Lascelles & Co., Bunhill Row	99	0	0
Wake & Dean, Southwark	88	0	0
J. J. Child	82	0	0
G. M. Hammer & Co.	78	0	0
Educational Supply Association, Limited	74	0	0
L. Seager, Sittingbourne	73	10	0
J. Sharpe, Peterborough	72	0	0
Taylor & Co., Driffield	68	10	0
Webb & Co., Salisbury	64	14	0
T. J. Syer, Finsbury Square	64	5	0
Bennett Furnishing Co.	61	17	0
J. HEYWOOD, Manchester (accepted)	57	0	0

WOOLWICH.

For Erection of Premises, No. 8 Powis Street, for Messrs. Matthews. Mr. H. H. CHURCH, Architect, Williams Street, Woolwich. Quantities by Mr. W. WHINCOP, 44 Norcott Road, Stoke Newington, N.

Bishop & Webb	£1,188	0	0
Multon & Wallis	1,108	0	0
Young & Lonsdale	1,089	0	0
H. Brown	1,067	0	0
J. Baxton	1,040	0	0
Chapman	1,025	0	0
H. L. Holloway	1,000	0	0
Balaam Bros.	990	0	0
Sandford	883	7	0

For Erection of Premises, No. 10 Powis Street, for Mr. Court. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 44 Norcott Road, Stoke Newington, N.

Bishop & Webb	£1,070	0	0
Young & Lonsdale	995	0	0
Multon & Wallis	992	0	0
H. Brown	972	0	0
J. Baxter	945	0	0
Chapman	927	0	0
H. L. Holloway	910	0	0
Balaam Bros.	894	0	0
Sandford	781	15	0

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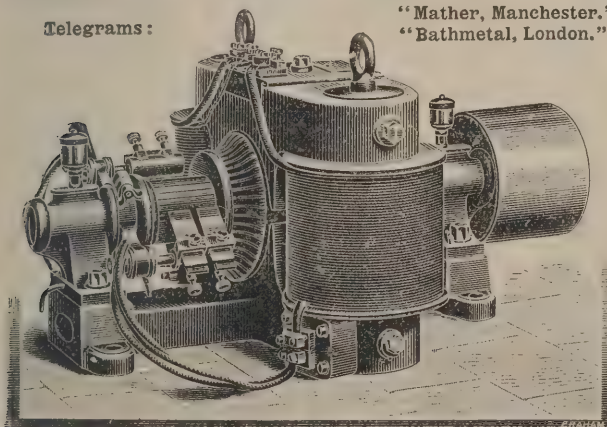
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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TRADE NOTES.

THE January return of the Cleveland Ironmasters' Association shows the following as the month's makes of pig-iron, namely, 102,000 tons of Cleveland iron and 122,000 tons of other kinds, a total of 224,000 tons; or 1,000 tons more than in December. There are 86 furnaces blowing, 44 of which are making Cleveland iron. The stocks increased 8,600 tons in January.

ACCORDING to the *Standard*, the further examination by experts of the well at Ashwick Court, near Shepton Mallet, shows unmistakably the existence of crude petroleum oil. The volume of water, owing to the rains, has, notwithstanding the pumping out of some hundreds of thousands of gallons, prevented the thorough emptying of the well. Boring operations will, the *Standard* says, be awaited with considerable interest.

WE mentioned last week that the new scheme for the supply of hydraulic power by the Manchester Corporation was successfully put into operation. The first supply of water was given to a set of hydraulic lifts erected by Messrs. Archibald Smith & Stevens in the new Mosley Hotel and adjoining premises. The new power will be regularly available in a few days.

MESSRS. RATCLIFF & HORNER have received from one foreign Government an order for seventy-eight large safes, and from another Government an order for sixty-one safes of their improved construction.

WE are informed that Messrs. Baird, Thompson & Co., ventilating, heating, &c., engineers, have recently acquired the splendid freehold property known as Charlton Engineering Works—also the property adjoining—together with the machinery and plant contained therein, and they are having the same fitted up with all the most recent improvements and labour-saving appliances suitable for their engineering and manufacturing requirements. The Charlton Works, which cover a large area, are centrally situated, being almost opposite the entrance to the Agricultural Hall, Islington, N., and it is claimed that when completed they will be the largest and finest in the trade, proving a most valuable acquisition in enabling this enterprising firm to cope with their largely-increasing business. The whole of the buildings are to be lighted by electric light.

THE Health Committee of the Birmingham Town Council have reported that they obtained tenders for the erection of the two additional pavilions, with the administrative buildings,

&c., at the Yardley Road Hospital. The estimate laid before the Council for the building of the hospital of four pavilions amounted to 25,940*l*. This included 2,850*l*. for engineering works (boiler, engine, laundry and cooking apparatus, disinfecter, &c.). The lowest tender received, that of Mr. W. Robinson, amounted to 25,282*l*. Adding to this 4,718*l*., the amount of the accepted estimate for the two pavilions, and 2,850*l*., the cost of engineering works not included in Mr. Robinson's tender, brought the cost of the work to 32,850*l*., or 6,910*l*. above the estimate reported to the Council. This decided the committee to omit the nurses' home from the present contract, bringing the amount of Mr. Robinson's tender to 18,742*l*. The first two pavilions are practically completed.

THE contract for the construction of the Burgas harbour works has been given to a Belgian company, which has offered to undertake the work for 4,230,000 francs, this tender being the most favourable sent in.

AT the meeting of the Leighton Buzzard Local Board a tender from Messrs. Garlick & Horton, London, was accepted for the execution of works of sewerage and water-supply, erection of water-tower and pumping-stations, supply of pipes, machinery, &c., under Contract No. 2, in accordance with plans and specifications by Mr. H. B. Nichols, engineer, at a sum of 18,987*l*.

VARIETIES.

MESSRS. ARCHIBALD SMITH & STEVENS, hydraulic engineers, Battersea, S.W., have presented their compliments to their clients in the very pretty and useful shape of a set of ivory tablets for pocket use. The memo tablets can be cleaned with a damp cloth for reuse, and there is abundance of space for jotting down memos. A calendar is printed in gold on the outside; also a beautiful specimen of one of Messrs. Archibald Smith & Stevens's hydraulic lifts.

ONE of the finest mansion-houses in Ireland, Lisbeg, the residence of Mr. John Gairdner, J.P., situated near Eyrecourt, co. Galway, has been destroyed by fire. It was erected about twenty-five years ago, 20,000*l*. being expended on it.

THE Mersey Dock Board have under consideration a proposal to erect on the north quay of the Hornby Dock a shed 1,430 feet long and 125 wide, at a cost of 60,000*l*. An improvement was



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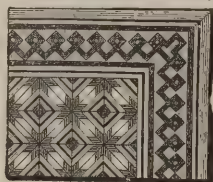
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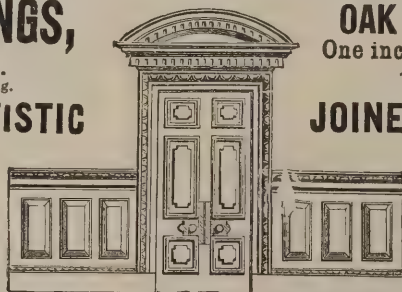
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Immense Stock always ready for Laying.



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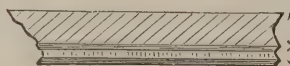


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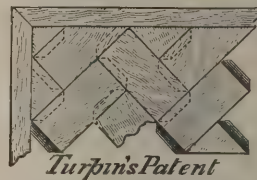
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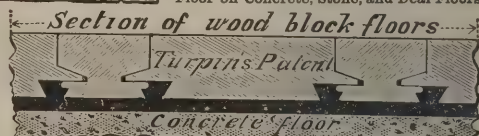
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Turpin's Patent

System of Preparing for Laying Inch Block
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Section of wood block floors

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rendered necessary owing to the present accommodation being inadequate for the trade of the port.

THE Local Government Board have notified their consent to the borrowing of 21,000*l.* by the Birkdale Board for purposes of sewage disposal.

At a special meeting held at Sunderland, the River Wear Commissioners resolved to accept an offer of the Public Works Loan Commissioners to lend the Board 175,000*l.* in order to complete the projecting piers at Sunderland harbour, and so render the port practically a harbour of refuge for the north-east coast. The works are in progress, and when finished the piers will be about a mile each in length, the work to be finished in seven years.

THE Local Government Annual for 1894 has been published, this being the third year of publication. No more valuable publication could be wished for, as it gives the names and addresses of the chief officials of all corporations, county councils, boards of guardians, urban and sanitary authorities throughout the kingdom, vestries, district boards, &c. Several improvements have been made in this volume, for the editor has this year added a complete list of the burial boards of England and Wales, with the names of the clerks. These occupy twenty-five additional pages. Besides these, he has added the names of the medical officers of the different corporations and the amount of the last yearly rate made by the London vestries. Ample space is afforded for memos and notes in the pages devoted to the diary. Looking to the fact that during the present year great changes will be made in local government, the Annual will be found to be of special value to all interested in public work.

MR. PARSONS, the superintendent of the parks in New York, reports that no further disintegration, even of the slightest kind, of the obelisk in Central Park, has been observed since the application to it of paraffin in 1885. Another coating was given last year to insure absolute preservation. The paraffin has sunk 6 inches into the stone.

THE Carpenters and Joiners' unions of Montreal are said to have recently made arrangements with most of the contractors of that city whereby in future nine hours shall constitute a day's work. The unions are also said to have determined a standard day's pay for all carpenters, the enforcement of which will be attempted after May 1 next.

THE *Manchester Guardian* says:—The Fire Brigade Subcommittee of the City Council has lately been considering the means of escape from lofty buildings in Manchester in case of fire. A list has been compiled of the premises where persons are known to reside above 50 feet from the ground, which is the extreme height to which the Brigade fire ladders can reach. The sub-committee recommend that a letter should be addressed to the persons interested, pointing out that it is incumbent on them to provide, at their own expense, sufficient means of escape in case of fire.

MESSRS. C. KITE & Co., of the Christopher Works, Chilton Street, Euston Road, have just carried out the ventilation of the Avenue Road Schools, Norwich; the new parochial offices, Brighton; new Admiralty extension, Whitehall (where about 600 ventilators have been fixed); at the Leicester Street and Shrubland Street Schools, Leicester; new markets, Halifax; and the York Building Board Schools, Southampton. Messrs. C. Kite & Co. are contractors to the Admiralty, War Office and Office of Works, and they received the highest award for exhaust ventilators at the International Health Exhibition of 1884.

THE paved streets of Chicago now have a length of about 1,016½ miles. Nearly 659 miles are paved with cedar, about 311½ miles are macadam roads, 25·3 miles have stone-block pavements, 20 miles have asphalt, and one mile is supplied with a vitrified brick surface.

IT is stated that Sir Thomas G. Carmichael, Bart., of Castle Craig, has supplemented his gift of bronzes to Selkirk Public Library by sending other four bronze reproductions from Naples. The figures represent Bacchus, Silenus, a faun and a drunken wine carrier. The originals were recovered from Pompeii or Herculaneum, and the Selkirk duplicates are reproduced in such a way as to show exactly the appearance of the bronzes on their being dug out after having lain about two thousand years in the lava or volcanic dust.

THE *Standard's* correspondent at Athens says:—Herr Noate, a young member of the German Institute, delivered an interesting lecture yesterday on some discoveries he has made in the dry bed of Lake Copais. He claims to have found there the remains of three large cities, one of which is greater in extent than Mycenæ and Tiryns together. He ascribes the works, which are admirable in form, to an ancient race of the dynasty of Minyæ, while the walls of the towns point unmistakably to the Mycenæan epoch.

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At Sheffield a meeting of the Jubilee Committee was held to consider an offer from the Town Trustees to sell to the Corporation for 7,000*l.* a plot of land in Church Street, adjoining the Gladstone Buildings, for the erection of a central free library and reading-room. The committee recommend the Council to purchase the land if the Town Trustees will contribute 3,500*l.* towards the cost of the site, the Corporation to proceed with the erection of the building as soon as the state of trade has sufficiently improved to warrant the expenditure of the money.

In the northern part of Washington County, N.Y., within a circle less than fifteen miles in diameter, are said to be the only red slate quarries ever found. There are two parallel veins about five miles apart, the one known as the Granville vein being best adapted for roofing purposes; the other, in Hatch district, and of softer quality, can be sawed into floor tiles and house trimmings. The material is very costly.

THE Stretford Local Board have resolved to proceed with the scheme for the erection of "destructors" and "sanitary dépôts" at Old Trafford and Longford Bridge, if the necessary loan can be obtained.

THE *Scotsman* says:—Work in connection with the construction of new dry and deep water docks at Leith has been somewhat unexpectedly stopped, all the workmen employed by the contractors, Messrs. Kinnear, Moodie & Co., having been paid off on Saturday afternoon. No official communication has as yet been sent to the Dock Commission regarding the matter, but it is understood that the suspension of labour has been occasioned by the recent death of the managing partner of the firm of contractors.

At the meeting of the General Purposes Committee of the Goole Town Council, it was decided to advertise for plans for the erection of a new market hall and shops to be built on the old site. The plans are open to competition, the first prize 100*l.* and the second 50*l.*

ELECTRICAL.

THE *Engineering Record*, New York, says:—Underground conduits in New York city now have a length of 1,667 miles. In these conduits there are about 32,600 miles of telephone and telegraph wires and 1,300 miles for wires for lighting purposes, with which about 6,790 arc lights and 268,000 incandescent lamps are connected.

THE Sanitary and Lighting Committee of the Scarborough Corporation have decided to adopt electric lighting at the Town Hall.

THE Blackpool Town Council have resolved to enlarge the municipal gasworks and the electric light works; 45,000*l.* was voted to the former, and although the latter have only been running four months, a further sum of 24,000*l.* is to be spent on new plant.

BUILDING AND BUILDERS.

At a public meeting held in Swansea, enthusiastic support was given to a scheme for building a church on the site of the present church of St. Mary.

THE new technical school at Lynn has been opened by the Duke of York. Among others, Mr. E. J. Silcock, the architect of the building, was presented to the Duke, the contractors being Messrs. Jarvis & Melton, and Mr. D. Clack clerk of works.

IT has been decided to erect a small-pox hospital for Bradford.

CHRIST'S HOSPITAL.

At the meeting of the Commission of Sewers on Tuesday Mr. H. G. Smallman, chairman of the Sanitary Committee, reported that plans and specifications for the temporary drainage of Christ's Hospital had been submitted by the authorities of the institution, and he moved that they should be referred to the Sanitary Committee to take such action as they might deem advisable with a view to the speedy reoccupation of the school. In this modified scheme, he said, the whole of the boys would not return, and those who were sent back would have 30 per cent. more cubic space than formerly. He thought they ought to assist the hospital authorities as far as they could in their endeavour to retain the school in its present site until its final removal to Horsham a year or two hence. But of course they must have due regard to their medical officer's report. Mr. Morton, M.P., said this was a proposal deliberately to influence the medical officer and the committee in their decision to send some hundreds of children back to an insanitary building, and he objected to it. Dr. Sedgwick Saunders, medical officer of health, said he should approach these plans with an open mind, and he should be especially glad if the Christ's Hospital site could be only used for a day school at present. The matter was referred to the Sanitary Committee.

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THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

A PAPER was read at the meeting of this Society by Mr. A. Fairlie Bruce on the "Rosario Sewage Works." The author commenced his paper by stating that public attention was not forcibly drawn to the unhealthy condition of the town of Rosario, in the Argentine Republic, until the cholera outbreak of 1886 aroused attention, and that plans for a system of drainage were then prepared by Mr. Featherstonhaugh and accepted by the authorities the following year. He then went on to describe the system adopted for the sewers, the town being divided for drainage purposes into three districts, namely, the Mendoza, Santa Fé and Catamarca. The Mendoza section has an area of about 1,200 acres, of which 740 are drained. The main sewer is oval in shape, has a sectional area of 25 square feet, a gradient of 1 in 500, and a discharge of 7,611 square feet per minute, equal to one-tenth of an inch of rainfall per hour. The heaviest recorded rainfall for four years was $3\frac{1}{2}$ inches in six hours and only a quarter to one-fifth of the rain reaches the drains. The sewage is discharged into the river Parana. Various interesting details were given of the work and its construction in the district just named, after which the districts of Santa Fé and Catamarca were dealt with. Allusion was made to the foul condition that the soil was in and the difficulties experienced in consequence in carrying out the tunnelling work, of which there was a large quantity, many men having suffered from blood-poisoning. The breakage of the iron pipes in unloading from the ships was only 1·1 per cent., and that of the stoneware pipes 2·6 per cent. Extracts were next given of reports of Sir Joseph Bazalgette and others as to the inappreciable effect of the discharge of the sewage into the river Parana. The author was the resident engineer, and Messrs. J. G. Meiggs, Son & Co. were the contractors.

REGISTRATION OF PLUMBERS.

THE Mayor of Leeds presided at the fourth annual meeting of the local district council for the National Registration of Plumbers just held in the Philosophical Hall, Leeds. There was a large and representative attendance, and among the gentlemen on the platform, were:—Mr. W. H. Bishop (past master of the Worshipful Company of Plumbers), Mr. J. Wreghitt Connon, F.R.I.B.A. (president of the District Council), Councillor Lee, Rev. Chas. Hargrove, Mr. C. Wood (waterworks superintendent), and various master and operative plumbers. The annual report of the Council was read by the hon. sec., Mr. W. Braithwaite. This went to show that the work of the Council had made satisfactory progress during the year; that the number of registered plumbers in the district now stands at 340; and that the local, practical and theoretical plumbing classes had been very well attended during the past session, and a good proportion of the students had passed satisfactory examinations—one of the successful students (A. Britton) having been admitted to the honorary freedom of the Worshipful Company of Plumbers. The Council again warmly thanked the authorities of the Leeds School of Science and Technology for allowing their rooms to be used for meetings of committees and the holding of the plumbing classes. It was reported that the Halifax Corporation have now followed the example set by the County Council for the West Riding of Yorkshire and have decided to employ only registered plumbers in the execution of municipal work. The Mayor, in moving the adoption of the report, said that scamped work in any department was bad; but faulty work in connection with plumbing had been known, as they were all aware, to have caused terrible disease and death to run riot in large households. Any efforts which they could make to meet this state of affairs, and to give those engaged in plumbing-work that knowledge without which they could not do it properly, would receive the hearty support of the public generally. Referring to the fact that some towns employ none but registered plumbers in the execution of municipal work, his Worship said that he thought it was only reasonable to hope that Leeds would shortly, with other towns, refuse to allow plumbers to engage in work for it without the guarantee that was given by registration, that they were, at any rate, able to do the work as it ought to be done. A resolution was passed in support of the Bill before Parliament for registration of plumbers, as "a measure calculated to benefit the public by tending to improve the sanitary condition of dwellings."

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THE TIDAL WEIR AT GLASGOW.

A REPORT has been presented to the Town Council by the committee on the erection of a tidal weir across the Clyde at the Green, with movable sluices on the same principle as the Richmond weir. The cost of re-erecting the weir would probably not exceed 45,000*l.* The committee also considered a scheme by Messrs. Ransomes & Rapiers, and visited the works of the Manchester Ship Canal, where a large number of their patent sluices were seen in course of construction and in actual operation. The sub-committee, after consideration of the whole matter, were agreed that, while the advantages that would be secured by the erection of the tidal weir were sufficiently great to warrant them recommending the proposal to the Town Council, the commercial benefit which would accrue to the Clyde Trustees in the improved condition of the navigation could not be over-estimated. They were therefore satisfied that the expense of erecting the weir—if the work was undertaken—should be equally divided between the two representative bodies. The sub-committee further stated that when an opportunity occurred of investigating the working of the Richmond weir they expected to be so much strengthened in their opinions as to recommend the Town Council to make the requisite application to Parliament next year for authority to proceed with this most important undertaking.

It was agreed to delay consideration of this minute till next month, Mr. Richmond stating that the kind of weir to be put up would be one of movable sluices and not a fixed weir, and that there would require to be negotiations with the Clyde Trust and other parties, and after that the matter would again come before the Town Council.

THE ANTWERP EXHIBITION.

A MEETING of the executive committee of the British section of the Antwerp Exhibition was held at the Mansion House on Saturday, the Lord Mayor presiding. Mr. James Dredge read a report on the recent visit of Mr. Walter H. Harris and himself to Antwerp, and the present position and future prospect of the British exhibit. They found that Mr. de Courcy Perry, the commissioner-general of the British section, had already received a very large number of applications for space, and that he had concluded more than one hundred contracts for space in the British section. They saw no reason to fear that Mr. Perry would not fill the large amount of space for which he was

responsible to the Belgian authorities. It was hoped that, with the aid of the chambers of commerce and the mayors throughout the kingdom, the demands for space would justify Mr. Perry in securing an additional 50,000 square feet within the main building, for which he had an option. The central court of the British section was about 80 feet wide and 160 feet long. The names of Sir Myles Fenton, of the South-Eastern, and Mr. Gooday, of the Great Eastern Railway, were added to the committee, and on the motion of Sir Albert Rollit the secretaries were directed to apply to the various railway and shipping companies trading between London, Hull, Leith, Grimsby, Harwich and Antwerp for details as to their charges for the carriage of passengers and goods to Antwerp during the term of the exhibition. The Lord Mayor, in reply to a question, said he had every expectation of being able to visit the exhibition in July next. Sir Joseph Barnby said if the expenses were guaranteed, he was prepared to take 200 pupils of the Guildhall School of Music to Antwerp, and to give two concerts a day for a week, in order to show the Belgian people and the visitors to the exhibition the perfection of English music. The cost would be about 600*l.*, but it would be recouped by the charge for admission to some extent. He hoped that the Corporation and the City Guilds might find it possible to start a guarantee fund and he would do his best to see that their guarantee would not be called upon. The Lord Mayor said Sir Joseph Barnby's excellent suggestion should be laid before the Music Committee of the Corporation, and he had no doubt they would favourably consider its feasibility.

MASTER BUILDERS' ASSOCIATION.

THE thirty-second half-yearly meeting of the National Association of Master Builders of Great Britain was held at the North Stafford Railway Hotel, Stoke, Staffordshire.

Owing to the death of Mr. Robt. Dennett, the late president (who died on November 24 last), Mr. Stanley G. Bird was elected to the chair, and representatives were present from London, Liverpool, Manchester, Birmingham, Hull, Derby, Bradford, Bristol, Coventry, Crewe, Burslem, Walsall, Kidderminster, Bolton, Preston, Hanley, Ipswich, Fenton, Stoke, Longton, Leeds, Leicester, Newcastle, Northampton, Tunstall and Salford.

The report and accounts, as submitted by the Council for the past half-year, were adopted and ordered to be printed and circulated.

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The Chairman reported that the usual half-yearly statements of hours worked, state of trade and supply of labour in the principal towns of the United Kingdom had been issued to the local associations. With reference to the form of contract, the respective committees of the Royal Institute of British Architects and the Institute of Builders has decided to meet in conjunction with the solicitors appointed to arrange the clauses, with a view to settling any differences that may still remain on the legal points, so that the matter may be finally closed.

The present position of the new Employers' Liability Bill having been discussed, it was decided that as the matter at present stands, no useful action could be taken by the Association.

Mr. John Bowen, of Birmingham, the senior vice-president, was elected president for the ensuing year, and he thereupon took the chair.

The President in his opening speech referred to the severe loss the Association had sustained in the deaths of their late president, Mr. Robert Dennett, and their secretary, Mr. William Knox. He congratulated the Association on the state of its finances, which, under the able management of the treasurer, Mr. Jos. Stevenson Jones, had so steadily improved and were now in a very satisfactory condition, and also on the attendance at the meeting, which was the largest he ever remembered. Mr. T. F. Rider, London, and Mr. Jos. Stevenson Jones, Liverpool, were elected vice-presidents; and Mr. Stanley G. Bird, London, Mr. R. Neill, jun., Manchester, Mr. J. Howard Colls, London, and Mr. J. C. White, Liverpool, were elected hon. vice-presidents, Mr. C. W. Green, Liverpool, hon. treasurer, Mr. W. H. Smith, Northampton, hon. auditor, and the following gentlemen members of the Council:—

Mr. C. H. Barnsley, Birmingham; Mr. W. Sapcote, Birmingham; Mr. J. Henry Marsden, Bolton; Mr. Wm. Moulson, Bradford; Mr. W. Holdsworth, Bradford; Mr. A. Krauss, Bristol; Mr. W. Church, Bristol; Mr. Jos. Bell, Cambridge; Mr. John Walker, Derby; Mr. Thos. Bonnar, Edinburgh; Mr. R. Bennett, Glasgow; Mr. R. Beevers, Hull; Mr. C. Myers, Leeds; Mr. Banks Mawson, Leeds; Mr. Wm. Henry Close, Lincoln; Mr. Hy. E. Dallow, Liverpool; Mr. R. Stevenson Jones, Liverpool; Mr. Jno. Burt, London; Mr. Frank May, London; Mr. William Southern, Manchester; Alderman William Brown, Manchester; Mr. W. H. Smith, Northampton; Mr. Enoch Hind, Nottingham; Mr. James Bowden, Potteries and Newcastle; Mr. John Walmsley, Preston; and Mr. C. B. Holmes, Wigan.

Mr. J. A. S. Hassal, of Liverpool, who was a partner with the late secretary, was appointed secretary.

Various matters of special interest to the building trade were brought forward and discussed by the members, including the important bearing of the case of *Temperton v. Russell* and the Hull Unions, wherein it was decided that further financial support should be accorded. It was decided to hold the next half-yearly meeting at Bolton. A hearty vote of thanks to the Chairman for his able services concluded the meeting. Prior to the meeting a number of the members were conducted through the pottery works of Messrs. Minton, where they viewed the whole process of manufacture. The Potteries and Newcastle Master Builders' Association entertained the delegates at luncheon and tea.

BIRMINGHAM WATER-SUPPLY SCHEME.

THE Water Committee, in their report to the city Council with reference to the progress of the new water scheme, record that the total areas acquired, including the purchases reported to the Council on May 16, 1893, are as follows:—Ancient freeholds, 4,747 acres 0 roods 3 perches; common and exclusive rights, 14,683 acres 1 rood 17 perches; minerals or mining rights, 5,879 acres 2 roods 9 perches; manorial rights, 20,222 acres. The acquisition of the lands on the watershed has constituted the Corporation landlords of a number of farms and of extensive sheepstocks, which, by the custom of the country, are purchased with the freehold and are let to tenants at a rental of 5 per cent. on their value, the tenant keeping up the number of the flock. Arrangements have been made with Mr. Stephen W. Williams, of Rhayader, to act as local estate agent for the Corporation, and agreements have been entered into with the several tenants with respect to their several holdings and the stocks of sheep thereon. A contract has been entered into with the Cambrian Railways Company for the construction of the railway junction at Rhayader with the Corporation railway, and another contract has been entered into with Mr. Henry Lovatt, of Wolverhampton, for the construction of the railway itself as far as the Caban Dam, a distance of 2 miles 1,463 yards. The work is now well in hand, and it is hoped it will be completed some time in May next. Mr. Lovatt's contract, the amount of which is 11,793*l.* 9*s.* 8*d.*, comprises the earthwork and the laying of the permanent way, the sleepers, rails and small ironwork being provided by the Corporation.

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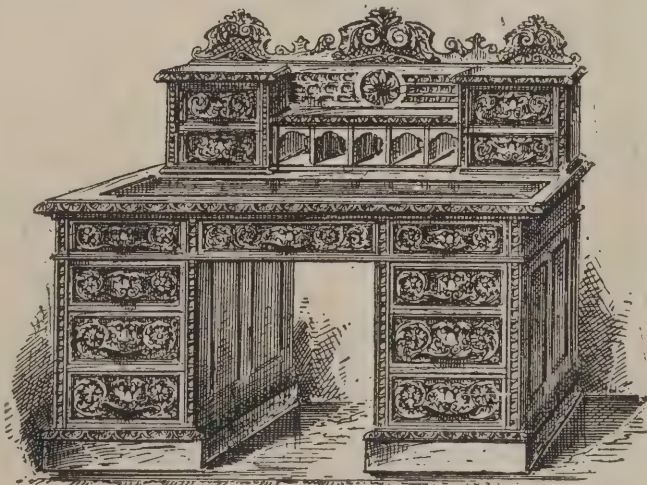
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With regard to the aqueduct, notices to treat have been served in respect of a length of 17 miles 6 furlongs, and in many cases agreements have been entered into, and grants will be executed in due course. Arrangements are proceeding for obtaining immediate possession of the lands required for the construction of that section of the aqueduct in which are the Dolau and Knighton tunnels. The Dolau tunnel is about $4\frac{1}{2}$ miles long, and the Knighton tunnel about $2\frac{1}{2}$ miles. The contracts for these, it is hoped, will be let early in the year. The erection of the various temporary buildings required for the works at Caban Coch, such as stables, stores, carpenters and smiths' shops, &c., and the provision of machinery and fittings for working them, are well in hand. The erection of wooden buildings for the chief offices and houses for the staff is also being proceeded with. Arrangements have been made at Cwm Elan House (one of the two large houses on the estate purchased by the Corporation) to provide quarters for the assistant resident engineers. Nant-Gwylt, the other considerable house on the estate, is now occupied by Mr. Yourdi, the resident engineer, and arrangements have been made for the use of some of the rooms by members of the committee and officials, when visiting the works. The assistant engineers immediately required have all been appointed, also the chief accountant at the works, and some of the subordinate officials; while in Birmingham separate rooms at the offices in Broad Street have been set apart for the Elan work, and a staff of clerks appointed. The committee have given special attention to the system to be followed in keeping the accounts, so as to retain a proper supervision over the expenditure under the various heads. The housing of the men who will be required in the construction of the dams and the various works incidental thereto has required much consideration on the part of the committee. A suitable position for a navy settlement was found about half a mile distant on the Breconshire side of the river Elan. A lease of this land, with possession, has been obtained, and a wooden village, capable of accommodating a total population of 1,000, of whom probably 500 or more will be workers, is now being constructed there. It will be necessary later on, when the dams at Pen-y-Gareg and Craig-yr-Allt-Goch higher up the Elan are commenced, to build a second village for the workmen to be employed there. The village will be furnished with various conveniences for the employes, which have already been described in our columns, but which are formally set out in the report. In their report presented to the Council on May 16, 1893, the committee stated

that they had decided that the dams and the several reservoirs should be constructed by the Corporation themselves. The report proceeded to say, "This decision applies only to the dams; the works in connection with the railway and aqueduct will be tendered for and let to contractors in the usual way." The committee are still of the same opinion, and they have accordingly, as stated above, let the construction of the railway to a contractor, and are making arrangements for letting the portions of the aqueduct required to be immediately undertaken. There are, however, works in the valley itself connected with the dams, but strictly speaking outside them, as to which other considerations apply. These further works are, the tunnel from the Dol-y-Mynach reservoir on the Claerwen to Careg-ddu, the straining and valve towers, with certain road diversions and other subsidiary works. Mr. Mansergh has pointed out to the committee that it will be extremely inconvenient to have contractors' men working in the valley together with those directly under the control of the Corporation. Complications would be sure to arise as to the occupation of the villages, and in other ways. The committee will be able to pick the men and to enforce their own regulations with regard to the staff employed directly by themselves; but it would be impossible to exercise the same control over men employed by contractors. In addition to the works which it had been resolved to construct by administration, and those named above, Mr. Mansergh suggested that the Corporation should itself carry out the remaining works in the Elan Valley, that is, those adjacent to the village, viz. the Craig-y-Foel tunnel, the Elan conduit and the Caethon syphon. The considerations pointed out by Mr. Mansergh appeared to the committee to be convincing. The complication and inconvenience of several sets of workmen being employed in close proximity would be embarrassing in the extreme. Many of the arrangements of necessity made for such a staff as must be employed upon the dams will serve without extension for the further men necessary for the additional works proposed to be undertaken. The committee have, therefore, approved of Mr. Mansergh's proposal that all the works in the valley, including the laying of the conduit for about three miles from the village, shall be carried out by the workmen of the Corporation. The rain-gauge at Nant-Gwylt, kept by Mr. Lewis Lloyd for some years, and which was of service in making the necessary calculations in reference to the yield of the watershed, has been continued. The total rainfall registered for the year 1893 was 56.61 inches.



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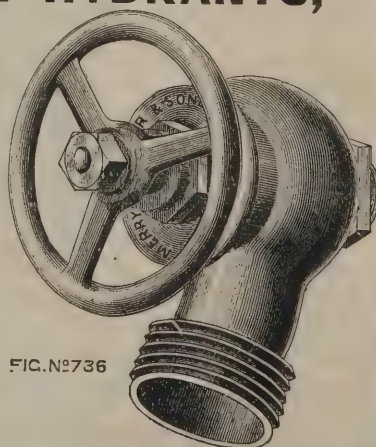
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BUILDING IN VICTORIA, BRITISH COLUMBIA.

AT the annual meeting of the British Columbia Institute of Architects, Mr. R. B. Bayne, the senior vice-president, delivered an address on the buildings in Victoria. He said:—There are few completed buildings in Victoria of the past year that will call for much more than a passing notice. A departure from the general run is seen in the Temple building offices of Messrs. Ward & Co., a red brick and terra-cotta building that suffers from its close juxtaposition with its high neighbour and is dwarfed by it. I would more like to feel with reference to it that the well designed and treated terra-cotta detail was made for it, and not its façade for the detail. There is in some grilles to the ground floor windows some very good ironwork.

The Davie block is another new block I would make a passing reference to. Some of you will remember the *Times*' criticisms, and the criticisms on such criticisms that followed, and the amusing reference to "Dog Latin" styles—Romanesque. To one who has studied Romanesque art in its native country such references will certainly be amusing. The term Romanesque as applied out here is a misnomer in every sense. The Five Sisters block was so called by the same authority when the designs for it were first seen. I do not like the trabeated architecture affected here by some of our architects in the use of roughly hewn stone; it looks coarse, especially when used in a third and fourth storey; and the zinc shams, such as find place in this block, are I think to be condemned as untruthful and unconstructive. Better put up with plainer and simpler forms if economy has to be taken into account.

The new Protestant Orphans' Home, perched as it is on a hill, might have had a more effective outline than it has, and the money spent on brick decoration, which is not seen until close under the building, might have been devoted to carrying up the roof of the semicircular portions of the front.

It remains to be seen what the two new ward school buildings will be when completed. There is a breadth of treatment about the north ward building that shows up effectually at present, if it is not going to be crushed in appearance by the roof.

I think that I may include the Board of Trade new building in this year's completion. I do not like it in hardly a single feature. I do not like to see a building, standing as it does the end and flank to the sea approach to Victoria, as factory-like in its want of treatment as this is, and there are bits of

eccentricity in the façade that seem to be simple indulgences as freaks of design—objectless. It is an error, I think, to put at such a height as is done here minute detail, and in the crowning feature of the cornice grotesqueness culminates in the intersecting ornaments—of tin—at the corners. The middle stage is decidedly weak in design, and the plan seems to me more of a puzzle than an economical arrangement in its broken stairs and crooked passages, and is badly lighted in many places.

I was one of the Victoria members of our Association who attended last year's meeting in Vancouver, and in the company of your other vice-president made the most of our time in seeing that city—grown out of all recognition to me since taking it in my visit from India in the latter part of 1888. We paid considerable attention and went over some new buildings under construction—and this period of construction is, as you all know, the time when shams stand unveiled, and when true construction can be seen. We were both forcibly impressed with the difference in character of the work done in Victoria and that done in Vancouver. In Vancouver the buildings have a degree of solidity and truth in them that is sadly wanting in buildings in our capital city; ours are only too often what I look on as mere match-box constructions. I think our architects should kick against it. I know where the difficulty comes in. Architect A, inclined to go in for something better than mere lath-and-plaster partition walls, goes in for brick in accordance with good by-law construction and the credit of his profession; he would soon be put out of the field by Z, perhaps a needy self-styled architect, who, creeping in behind A, informs A's client that he, Z, can save at least 1,000 dols. of cost, said client being left entirely in the dark as to where and how the so-called saving comes in. To my mind A should carefully and thoroughly urge upon his client the question of stability and solidity as against "jerry work" and then, only on his client accepting responsibility, go in in opposition to Z, and fight him with his own weapons. I fear, though, that some of our clients, if reports are true, play you off one against the other and then take the cheapest; some of you sell your work Dutch auction bidding. In my three years of residence in Victoria I have seen such construction as I would not have ventured on, and yet in my work and practice in India I have done work in construction much bolder than my peers. The work I refer to as done in Victoria is not healthy work of construction, and I think it regrettable that in the capital of the province our architects should feel impelled to do such work—

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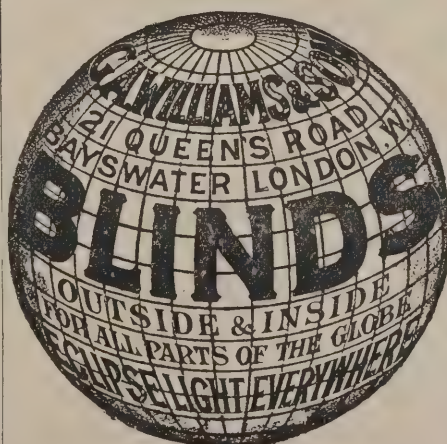
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that such work should be looked on as a necessity. Men as owners of such work cannot, I think, have had them built as investments—only to sell—and even then false economy.

I was very much surprised only the other day to learn that the building inspector in Victoria has it in his power to alter a detail of construction in an architect's design. I should protest against such interference in the construction details in a competent architect's work; I mean one who may be reasonably credited with possessing sufficient knowledge of construction. I think that with good by-laws and a good inspector to see them honestly carried out, interference with an architect's construction would not be called for, and with good by-laws, not restrictive ones, and a resolute enforcement of them, such buildings as I have commented on would not be perpetrated.

It is within my province to-day to enter my protest against the recent action of the bricklayers of this city in their striking against the appointment of a clerk of works not belonging to their organisation, appointed for the municipal supervision of their work by the municipal authorities, and I anticipate that you are all of one mind. If such action and claim as they made were once acceded to, on such a plaint as was theirs, it would place us architects quite at their dictation.

Before we meet again, gentlemen, let us hope that things may improve with us all, and that we will be all busy men as now too many of us are idle men.

PUBLIC BUILDINGS IN CANADA.

To what extent and in what manner the Government is justified in encouraging by substantial aid the development of art depends, says Mr. G. F. Stalker in the *Canadian Architect*, upon a variety of circumstances. The possession, however, of galleries of art treasures and of fine buildings is an unmistakable evidence of national culture and progress, and no country having any pretension to greatness can afford to be without them. The balance-sheet of the finance minister is, after all, only a temporary index of national solvency. We must look into a different ledger for the indelible marks which show the onward or backward movement of the people. But the finance minister and every other minister can do a vast amount to foster and develop such thoughts and feelings as will ineffably impress themselves on the national character, and find expression in works of art which will be an indication to future generations of our standing as a people.

The ministers of the Crown in this country are the chosen leaders of the people, and they like to be spoken of as such. But they are in many instances only the followers of public sentiment. Ideas and schemes, which on the face of them have the stamp of necessity (sometimes of urgency), are put on one side because there has been no public demand for them, and so much valuable time is wasted in weary waiting for the great unwieldy mass of the people to meet together, formulate their ideas and submit their wishes to those in authority. All this seems just the reverse of what it ought to be. The wise leaders whose names have come down to us have been men who, being in advance of their time, have educated the people up to their ideas, and legislated and acted without the necessity of ever-recurring agitation and turmoil.

At present we want one or more of the ministers to strike out and take the lead in national art matters. The course is perfectly clear, and whoever steps into it will have the satisfaction of knowing that the laurels which he will gain will not be plucked from the brow of any of his contemporaries, nor from the chaplet of any of his predecessors.

It is, of course, freely admitted that there are difficulties in the way, the chief one being that we belong to a somewhat utilitarian race. The British people have never been too lavish in expending money on "mere works of art," and it has taken a long time to bring them to acknowledge the refining influences of the beautiful and pure in art upon the national character. But this is admitted now, and leading men throughout the empire lose no opportunity of impressing this truth upon us. In fact, if we look at the matter fairly, the encouragement of art by the national Government is really utilitarian in its effect. The national advancement and refinement are a *quid pro quo* for the national expenditure.

A slight indication of the way the wind is blowing was given during the last session of the Dominion Parliament. While the estimates were being discussed the Minister of Interior asked for a beggarly sum of one or two thousand dollars for the annual expenses of the National Gallery, when from an unexpected quarter a loud complaint was raised because the sum asked was not twenty or thirty thousand, which would have been as readily granted as the smaller sum. The fact that the complaint met with the general approval of the House is sufficient to show that the time has gone by when ministers need be afraid to ask for the expenditure of public money for art purposes, and it must be with satisfaction that every man of education and good sense will regard this fact.

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But it must not be supposed, in speaking of art, that painting and sculpture only are referred to. Architects need not take a second place to their brothers of the brush and chisel in the beneficial effects on the public mind which are produced by their own branch of art. On the contrary, its place in the trio of the fine arts has always been and will ever be the first. And while as an art it exercises its refining and ennobling influences on the mind, it is practically interwoven with every phase of human existence.

On this account and because it would be impossible to conduct the business of the country without necessary and adequate building accommodation, architecture has received a fair amount of encouragement at the hands of the Government. No fault can be found with the different Governments so far as providing buildings when and where they have been found necessary. But the system which was adopted at the birth of the Dominion, and which was both necessary and suitable for that time, has nothing to recommend its continuance at the present. When the Dominion came into existence there were very few architects in the country, and comparatively no very great demand for them. Since then, however, the country has made rapid strides and has developed in every direction to an abnormal extent. With this growth has come the demand for a better class of building, and architects have come into the country and grown up in it to supply the demand; so that the larger cities particularly are well provided with buildings of a high order, and give unmistakable evidence that we have in our Dominion as capable a body of architects as are to be found in any other country at the present day.

The Government has no need, therefore, to restrict itself for its architecture to the abilities and services of one man, as was necessary and suitable thirty years ago. The system which we followed at Confederation was the best system for a young country; but we shall be doing a wise thing when we follow the example of Britain and other countries, and give opportunities to more than one architect to display their architectural abilities.

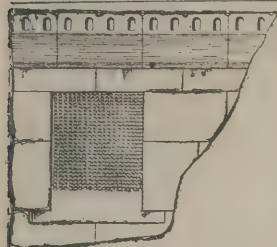
In quite recent times there have been a great many large public buildings erected in England, such as the Foreign Offices, the Law Courts, the Natural History Museum, the Admiralty Offices, &c. In every case the designs for these buildings were chosen either by public or limited competitions. The object the British Government had in view in these competitions was, not only to obtain the best designs, but to give to architects generally an incentive to put forth their best efforts

and to bring into prominence the talents of some who would otherwise have remained unknown.

It is impossible to over-estimate the benefits to the profession and to architecture in England which have resulted from these competitions. The influence of the designs that were submitted, and that remained for many weeks on public exhibition, has completely revolutionised architecture in England. At the beginning of the present century, and until about fifty years ago, architecture in England was at a very low ebb. Now there is no country in which buildings are erected on a grander scale, of more beautiful design, or where so much attention is given to architectural principles and detail.

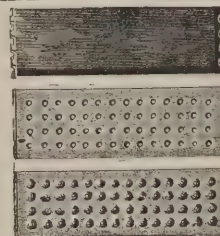
To say that this has been brought about by the system of having competitive designs for Government and other buildings would be to claim a great deal too much. But no one can deny that this has been one of the most potent factors in producing the change. If such a system were to be adopted in Canada there is no doubt that the effect upon the architecture of the country would be beneficial, but it would give national encouragement to architecture without incurring any further charge upon the Dominion exchequer than is incurred now. The cost of maintaining the architect's department in connection with the Government amounts to more than 5 per cent. of the annual value of the buildings erected. The change would therefore involve no financial loss, but rather a gain to the country. It is not, however, for this reason that the question is here raised. Neither is it from any desire to find fault with the present Government architect, or to speak disparagingly of his ability. If the present system is to remain unchanged, it would be no easy matter to find, in the whole Dominion, a man better qualified for his position. But the circumstances which rendered such an office necessary no longer exist.

The buildings erected by the Dominion Government are chiefly post-offices, custom-houses, government offices and drill-halls, and though there is not much variety in the classes of buildings, the location and local requirements introduce elements sufficient to require considerable variety of treatment. But the most versatile architect becomes in the course of time liable to repeat himself; he may even become stereotyped in his versatility. We cannot therefore look for much progress in the architecture of our national buildings, when we continue through a long series of years to engage the services of only one man. But we are certainly running the risk of remaining at a standstill in this respect, and to do so is to retrograde.



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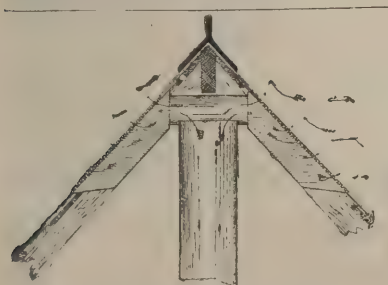
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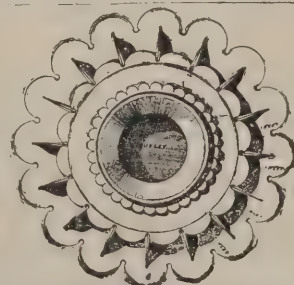


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But if it be a wise thing for the Government to secure by competition the best designs from the best architects in the country for our public buildings, it would be equally unwise to abolish absolutely the office of Government architect, and here again we might imitate the practice of the motherland. In all public buildings there are changes made as time goes on. And so, when any building has been completed according to the architect's design, the plans are deposited with the Government architect, who, with a sufficient staff of capable assistants, will look after any future changes which may be found necessary.

As already stated, the course is open for any minister of the Crown to distinguish himself by lifting our national art up to a higher level than it occupies now. And the foregoing is humbly submitted as an outline of a system which could easily be adopted in regard to our public buildings, and one which would give great satisfaction to the profession generally, as well as being of inestimable and lasting benefit to the country at large.

GLASGOW MUNICIPAL BUILDINGS.

At the last monthly meeting of the Glasgow Town Council, the sub-committee on the decoration of the banqueting-hall in the Municipal Buildings having submitted an interim report on the decoration of the banqueting-hall, the committee resolved to recommend that they should be authorised to visit and inspect, along with Mr. Leiper, some recent examples of the best decorative work in important public buildings, with a view to the preparation of such a scheme for the decoration of the banqueting-hall as the sub-committee could recommend to the Municipal Buildings Committee and to the Town Council.

Mr. Jack moved that the minute be not approved, but that it should be remitted for consideration.

Mr. W. F. Anderson moved that the paragraph be not approved. It seemed to him an extraordinary thing that having called in a man of skill he had practically admitted his inability to do the work. His opinion was that they were disgusting the ratepayers with deputations. He understood the proposal was that they should go to London, Paris, probably Rome, and possibly they would find the best example at Manchester on the way home.

Baillie Pettigrew considered that the best way would be to obtain competitive designs for the decoration.

Mr. Shearer said the committee had already had the benefit of the advice of the best artists in the city, and before any scheme was put before the Council the committee would have the advice of the best artists in Great Britain.

Mr. R. Anderson urged the importance of the committee obtaining such information as would enable them to have the highest possible artistic result.

Mr. Campbell urged his friends to withdraw their amendment. He looked with no favourable eye on the spending of large sums on deputations, but after careful investigation into the circumstances he was prepared to support the motion.

Mr. Osborne proposed that the number of the deputation be limited to three.

Treasurer Gray said they had every reason to be proud of the chambers, but there was no hurry for proceeding with the decoration of the banqueting-hall. It was not often used; they did not want to use it very often. The work of decoration could stand over for a year or two.

After some further conversation, Mr. Wallace agreed to limit the deputation to three members of the Council, with Mr. Leiper; and the amendments of Mr. Jack and Mr. Anderson were combined and put against the motion, when the minutes were approved by 33 to 25 votes.

LABOUR IN NEW SOUTH WALES.

THE Minister for Works in New South Wales has issued the following regulation with the object of excluding strangers from employment on public works:—"If it shall be represented to the Minister for Public Works at any time during the progress of the contract that an undue number of men are being employed thereon who have not been domiciled in this colony for six months previously to such employment, and such allegation be proved to his satisfaction, the Minister shall have power to call upon the contractor to discharge any or all such men, and on such direction being conveyed in writing to the contractor under the hand of the Under-Secretary for Public Works, the contractor shall discharge such men forthwith, and in the event of the contractor's non-compliance with any such direction, the Minister shall have power to declare such contract to be cancelled as if this stipulation had been expressly set out in the cancellation clause of the general conditions relating to the said contract."

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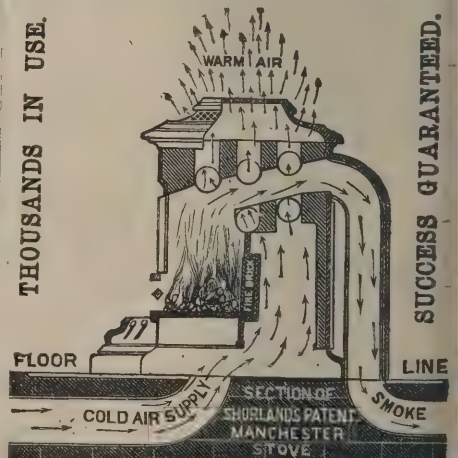
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TOWN FOG.

A LECTURE has been delivered under the auspices of the Leeds Corporation by Dr. J. B. Cohen, of the Yorkshire College, on "Town Fog." According to the *Leeds Mercury*, he said that before discussing the nature and effects of town fog, they would begin, as in the first lecture, in the case of carbonic acid, by seeking for its origin. Town fog was mist made white by nature, and painted any tint, from yellow to black, by her children. It was born of the air of particles of pure and transparent water, and contaminated by man with every imaginable abomination. How did this mist arise? It was water, vapour or steam, always present in the air in varying quantities, which, by a fall of temperature, suddenly appeared either as mist, or rain, snow, hail, or dew, according to the extent and rapidity of the cooling and the amount of water-vapour present in the air at the time. The amount of water-vapour in the air depended upon the temperature of the air, and this, no doubt, had been observed by all of them, because when the weather was warm and dry damp clothes would dry much sooner than in colder weather, or when the air was very full of moisture. There was one interesting and curious fact about the formation of fine particles of mist, or the larger particles we called rain-drops, or dew, namely, that the starting-point, the nucleus of each of these particles of water was a speck of dust—a speck so minute that it was generally invisible to the naked eye. Without dust there was no mist, or rain, or dew. It was solid matter which was the starting-point for the deposition of moisture. What would happen if air free from dust were saturated with moisture and the temperature fell? Water would be deposited, but only on solid objects. It would deposit on the ground and on our buildings; it would stream down the walls of our houses and soak the surface of the earth. Every solid thing out of doors would be wet, but no mist would appear and no rain would fall. Dust and vapour were, then, the parents of mist. What was the character and quantity of this mist? We knew that it was very plentiful in our houses. So far as we knew, it existed everywhere; but, of course, the quantity varied enormously. Some of the substances which were found in ordinary dust, which was sometimes allowed to accumulate in our houses, included spores, starch grains, crystals, meteoric iron like bits of soot, salt and bacteria. Much of this dust was so fine that it was invisible under ordinary circumstances. It was only when a beam of light in a darkened place, a ray of sun-

light in a room, a street lamp on a dark night, illuminated these little particles, so that they stood out against a darker background that we saw them—the so-called motes dancing in the beam. It was, in fact, these little particles which made the beam of light. Without the particles the path of the beam would be invisible. Although we breathed in this large amount of dust into our lungs, the greater part of that dust never came back again from our lungs, and there was little doubt that it must make a serious difference when it accumulated either in the wind-pipe or in the lungs. Referring to the weight and number of dust particles, which played such an important part in the production of fog, the lecturer noticed the experiments made by a distinguished physicist, John Aitken, to determine the number of dust particles in the air. By using a small vessel and dusty air largely diluted with air free from dust, he had succeeded in producing an apparatus in which the dew-drops or mist-drops were sufficiently small in numbers to be counted. After explaining the apparatus, Dr. Cohen said the total number of dust particles in the air varied from 8,000 to 100,000 in the cubic inch in the country, and in the towns they varied from 1,000,000 to 50,000,000 in the cubic inch. He was not satisfied with taking Mr. Aitken's results, and he borrowed the instrument to determine the number of dust particles in different parts of Leeds. At Woodhouse Moor he found the ratio of particles was over 32,000, at the Yorkshire College 52,000, and at the parish church churchyard over 200,000 in the cubic centimetre. Now, curiously enough, that corresponded with the centre of the town of Glasgow, with the wind blowing from the same direction—the north-west—which was 228,000, according to Mr. Aitken. There was one point to which he wanted to call their attention. He found that there were actually fewer dust particles in a flour mill, where the air was thick with dust, than there were in the parish church churchyard, but the size of the particles was very much greater, and that was the reason why the number was smaller. The probable reason was that in the process of cleaning the flour, the dust particles got electrified and coalesced. Alluding to the life-history of fog, the lecturer said that with a calm atmosphere, a high barometer and a fall of temperature a film of water would coat each, or an occasional little floating particle of dust, as it were, with an overcoat to keep it from the cold. A white fog covered the town. The particle of dust, now heavily weighted with its unwonted cloak of moisture, had its progress impeded, it hung or fell, but did not rise, and in its turn impeded the movement of the air.

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Stagnation of the atmosphere was produced, especially as the wind was usually light with fog. What happened? An accumulation of combustive products occurred, namely, carbonic acid, sulphurous acid and soot, which, under ordinary circumstances, were rapidly dispersed. Our senses gave us abundant evidence of this in the case of soot and sulphurous acid. Our faces and clothes were soon begrimed, and our eyes and throats suffered from the irritating effects of the acid. If we assumed that dust particles were the cause of fog, then it naturally followed that the more dust particles there were in the air the thicker the fog; and, moreover, each particle of water floating as fog became coated with a film of sooty oil. The effect was that evaporation was retarded and the fog persisted longer than it would do were these particles composed of pure water only. He thought there could be no doubt in anybody's mind that fog had a very serious effect in increasing sickness and mortality, particularly the death-rate due to respiratory diseases. Dust was the mother of mist and rain. Whether our dusty town atmosphere brought us more mist or more rain it was difficult to say with any certainty. Whatever the facts might be, it was interesting to remember that dust was its own destroyer. Rain, snow and mist dragged it to the earth and so washed and purified the air. Were it not so, the greater part of the twenty tons of smoke daily sent into the air of Leeds would continue to float for ever in the ocean of air around us. That that atmospheric dirt was gradually delivered back to the earth was poor consolation to us who suffered from town fog. He had one suggestion to make. Those who had followed his lecture so far would, he was confident, agree with him as to the serious importance of this subject of town air, from the nature and extent of air pollution here in Leeds, its marked effect on the life of its citizens, especially of its working population and its effects on vegetation, and indirectly, therefore, on the possibility of purifying the atmosphere. Our medical officers, in their weekly or quarterly returns, usually included a certain amount of interesting and useful information about the weather, the temperature and the barometer readings. These weather statistics had their value in relation to epidemic and endemic disease. He did not wish to underrate them but how vastly more important was it for us to know the extent of our air pollution. And the matter carried still further weight from the fact that the weather was beyond our control, but the purity of our town atmosphere lay in our own hands. We wanted our experimental stations—our watch-towers within and outside the town—where the condition of the

atmosphere might be constantly tested, where, with every new progressive step in air purification, we might watch the effect on the atmosphere as well as on the health of the citizens. This need be no costly undertaking. Three or four intelligent lads of fifteen or sixteen, with a good Board school training, under the control of the city analyst or other competent chemist, could manipulate all the necessary apparatus, which in itself was simple and not costly.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 1323. Frederick William Baker, for "Improvements in casements."
- 1355. Alfred Standing, John Thomas Searle and Harry Watts, for "Improvements in smoke-consuming devices."
- 1366. James Rumgay, for "Improved apparatus for hanging doors and gates."
- 1422. Sampson Morley, for "Improvements in the construction of gulleys."
- 1437. William James Jordan, for "Improved double-hung window sashes and frames to facilitate cleaning."
- 1441. Thomas Cosham, for "An improved fire-escape."
- 1443. Samuel James Barford, for "Improvements in screw-down valves for water and other liquids, steam and gases."
- 1494. Franz Weiss, for "Improvements in fastenings for doors and the like."
- 1507. William Gibbon, jun., for "Raising sashes and lowering same without cords and weights."
- 1520. Richard Challenor and Herbert Walker, for "Improvements in hinges for step-ladders and the like."

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COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb. 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ANTRIM.—March 5.—For Building Lunatic Asylum at Holywell. Mr. J. Lanyon, Architect, Northern Bank Chambers, Royal Avenue, Belfast.

ARMLEY.—Feb. 17.—For Alterations to Town Schools. Mr. C. F. Wilkinson, Architect, 35 Park Square, Leeds.

BATH.—Feb. 24.—For Execution of Work, Supply of Materials, &c., for One Year. Mr. C. R. Fortune, City Surveyor, 3 Terrace Walk, Bath.

BATHGATE, N.B.—For Building United Presbyterian Church. Mr. Thomas Dodds, Solicitor, Bathgate.

BATLEY CARR.—Feb. 16.—For Building Six Dwelling-houses. Messrs. P. Spencer & Son, Architects, Batley Carr.

BEDWAS.—Feb. 17.—For Building Board School and Additions to Bridge School. Mr. Evan Davies, Architect, Maesycwmmwr.

BILLINGSGATE.—Feb. 27.—For Construction of Underground Conveniences. The Engineer to the Commissioners of Sewers, Guildhall, E.C.

BIRKDALE.—Feb. 19.—For Supply of Glazed Pipes, Bricks, Cement, Broken Stone, Wrought and Cast-iron Work, &c. Mr. J. Fairbairn, Town Hall, Birkdale, Lancs.

BIRKENHEAD.—Feb. 19.—For Boundary and Retaining Walls, &c., for Refuse Destructor Site. Mr. C. Brownridge, Borough Engineer.

BRADFORD.—Feb. 19.—For Building Business Premises. Messrs. Empsall & Clarkson, Architects, Tyrrel Chambers, Bradford.

BRADFORD.—Feb. 19.—For Building Store and Two Houses. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

BUCKHURST HILL.—March 3.—For Tar-paving the Playgrounds and Footpaths at Boys' Board School. Mr. E. Egan, Architect, Chigwell.

BUCKHURST HILL.—March 3.—For Enlargement of the Boys' Board School. Mr. E. Egan, Architect, Chigwell.

BURSELEM.—Feb. 21.—Additions and Alterations at Chell Workhouse. Messrs. Ford & Slater and Mr. Walley, Joint Architects, Burslem.

CHICHESTER.—Feb. 21.—For Additions to Workhouse and Works of Drainage and Water Supply. Messrs. Inkpen & Swinburne, South Street, Chichester.

CHORLEY.—Feb. 20.—For Building Wesleyan Chapel. Mr. W. H. Dinsley, Architect, 20 High Street, Chorley.

CO. SUTHERLAND.—March 5.—For Construction of Three Harbours. Mr. James Barron, Engineer, 7 Union Terrace, Aberdeen.

CROYDON.—Feb. 20.—For Repair of Palmerston Road, Croydon, and Harrold Road, Upper Norwood. Mr. C. M. Elborough, 8 Park Street, Croydon.

ESSEX.—Feb. 16.—For Supply of Broken Granite for the Repair of Main Roads. Mr. Percy J. Sheldon, A.M.I.C.E., Chelmsford.

FAILSWORTH.—Feb. 28.—For Construction of Two Main Outfall Sewers, Pipe Sewers, &c. Messrs. Lomax & Lomax, Engineers, 29 Grosvenor Chambers, Deansgate, Manchester.

FAREHAM.—Feb. 26.—For Building Block for Fifty Children at County Lunatic Asylum. Mr. B. S. Jacobs, Architect, Lincoln's Inn Buildings, Hull, and 88 Bishopsgate Street, E.C.

FINSBURY PARK.—Feb. 21.—For Building Dressing-room and Shelter for Cricketers. The Architect, County Council, 13 Spring Gardens, S.W.

GODALMING.—Feb. 22.—For Construction of Contributory Drainage (Two Contracts). Mr. Samuel Welman, Surveyor, Church Street, Godalming.

GUILDFORD.—For Erection of Infirmary Buildings at Workhouse. Messrs. Peak & Lunn, 36 High Street, Guildford.

HENDON.—Feb. 19.—For Execution of Work and Supply of Materials for One Year. Mr. S. S. Grunley, The Boroughs, Hendon.

HORNSEY.—Feb. 23.—For Execution of Sewerage and Drainage Work, Street Watering and General Cartage Work, Concrete Footway Pavements, and the Supply of Stoneware Pipes and other Stoneware Goods, Broken Granite and other Road Materials, Broken Stone for Macadamising, Paving Granite and General Masons' Materials, Portland Cement, Grey Stone Lime, for One, Two, or Three Years. Mr. F. D. Askey, Clerk to Local Board, Southwood Lane, Highgate, N.

HYDE.—Feb. 26.—For Building Cemetery Chapels. Messrs. J. W. & R. F. Beaumont, Architects, 10 St. James Square, Manchester.

ISLINGTON.—Feb. 22.—For Supply and Fixing of a Hot-water or Steam Boiler at St. John's Road Workhouse. Mr. William Smith, Architect, 65 Chancery Lane, E.C.

ISLINGTON.—Feb. 22.—For Execution of Works and the Supply of Materials for One Year. Mr. W. F. Dewey, Vestry Hall, Upper Street, N.

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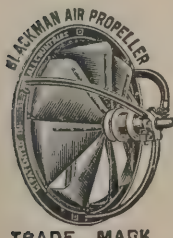
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LLANELLY.—March 10.—For Building Town Hall and Public Offices. Mr. Wm. Griffiths, Architect, Falcon Bridge, Llanelly.

MANCHESTER.—Feb. 23.—For Building Fruit Auction Sale-room, Shops, Offices, &c. Mr. John Allison, City Surveyor, Town Hall, Manchester.

MARYLEBONE.—Feb. 20.—For Erection of a Test Wash-house in Northumberland Street. Mr. A. Saxon Snell, F.R.I.B.A., 22 Southampton Buildings, Chancery Lane.

MYNYDDISLWYN.—Feb. 26.—For Additions to Board Schools. Mr. George Rosser, Architect, Albion Chambers, Newport, Mon.

NELSON.—Feb. 25.—For Building Cemetery Chapels. Mr. H. Whitaker, Architect, 26 Every Street, Nelson.

NEWARK.—Feb. 19.—For Construction of Engine and Boiler House, Chimney, Cottages and other Buildings and Works at Pumping Station. Mr. Henry Rofe, Engineer, 8 Victoria Street, Westminster.

NORTH-EASTERN RAILWAY.—Feb. 28.—For Supply of Four Pairs of Wrought-iron Lock Gates. Mr. T. M. Newell, Dock Office, Hull.

PONTYCWMMER.—Feb. 21.—For Additions to Board School. Mr. P. J. Thomas, Architect, Bridgend.

PRAZE.—Feb. 24.—For Building Mixed School. Messrs. Carah & Son, Architects, Praze, Camborne.

ROCHFORD.—Feb. 26.—For Sinking and Construction of a Well and Bore-hole at South Queensbury. Mr. James Mansergh, 5 Victoria Street, S.W.

SOUTHEND.—Feb. 19.—For Construction of Concrete Groins. Mr. C. T. Copley, Borough Surveyor, Clarence Road, Southend.

STOKE MANDEVILLE.—Feb. 17.—For Building Board School and Offices. Mr. W. F. Taylor, Architect, Temple Street, Aylesbury.

STOKE NEWINGTON.—Feb. 16.—For Jobbing Sewer and Drain Works. Mr. George Well, Clerk to Vestry, 126 Church Street, Stoke Newington, N.

ST. SAVIOUR'S.—Feb. 27.—For Supply for One Year from March 25 next, of York Paving and Granite Curb, in such Quantities as may from time to time be Ordered. Mr. W. H. Atkins, Emerson Street, Southwark.

TON PENTRE.—Feb. 23.—For Erection of Library Buildings. Mr. Jacob Rees, Architect, Hillside, Pentre, Rhondda.

TOTTENHAM.—Feb. 27.—For Making-up Culvert Road, Napier Terrace, Hermitage Road and Selwyn Road. Mr. P. P. Murphy, School Board Offices, High Road, Tottenham.

WAINFLEET.—Feb. 19.—For Construction of Sheep and Cattle Market. Messrs. James Martin & Son, Wainfleet.

WATFORD.—Feb. 19.—For Additions to Police Station. Mr. Urban A. Smith, County Surveyor, 28 Victoria Street, S.W.

WEST HAM.—Feb. 20.—For the Construction of 1,000 Feet of Roads and Sewers. Mr. C. W. Carrell, Clerk to Local Board, Broadway, Stratford.

WEST HAM.—March 13.—For Erection of a Block of School Buildings and Appurtenances at Upton Park. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

WHITEHAVEN.—Feb. 21.—For Building Infectious Diseases Hospital. The Town Surveyor, Whitehaven.

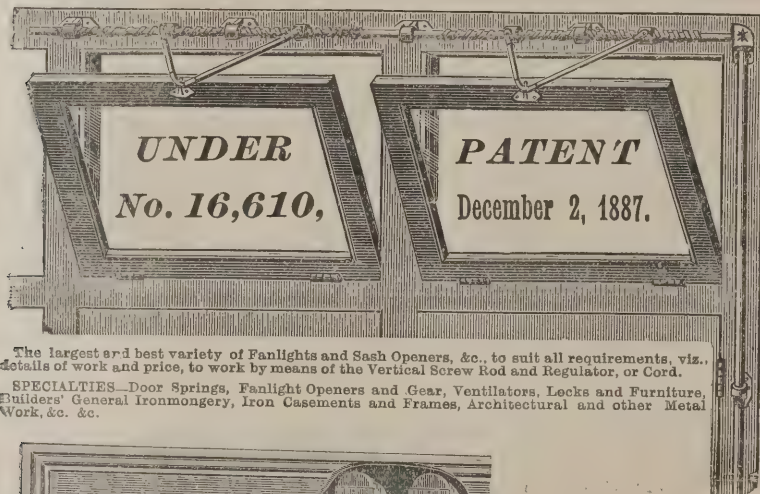
WOOD GREEN.—Feb. 23.—For Tar-paving Works. Mr. J. W. Britton, Town Hall, Wood Green.

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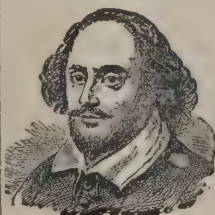
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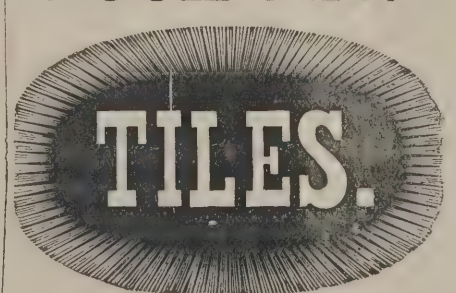
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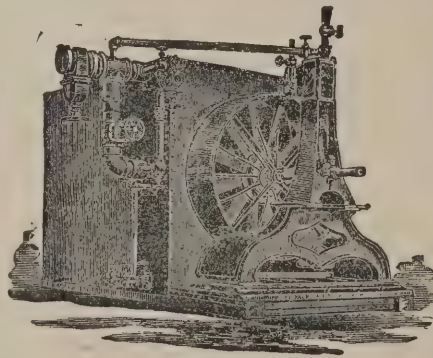


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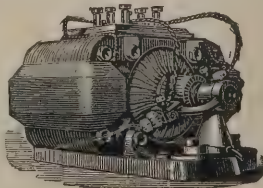
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TRADE NOTES.

THE Denton Holme Schools, Carlisle, are being warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

MESSRS. FREDERICK JONES & CO., of Perren Street, Kentish Town, N.W., the patentees and manufacturers of the Patent British-made Silicate Cotton, have supplied and fixed a large quantity of the silicate cotton for the Queen's Hall, Langham Place, W. The wall was protected with this material for the purpose of preventing the transmission of sound to St. George's Hall, which adjoins it. The result was an unqualified success, and fully justified the expectations of the architect, Mr. Thos. E. Knightley.

BUILDING AND BUILDERS.

At the holding of the Kinning Park Dean of Guild Court, Provost Campbell, who presided, said that before proceeding with the ordinary business he desired to make a statement. As it appeared proprietors in the burgh did not generally understand that it was necessary to lodge plans with the surveyor and get the permission of the Dean of Guild Court before making alterations on their properties, he wished to draw their attention to the fact that by neglecting to do so, or by deviating from plans which had been sanctioned, they were not only rendering themselves liable to a penalty, but might have to take down their buildings or restore them to the state they were in previous to the alterations. It was also necessary that on completion of any new building, or alteration on an existing building, the owner or builder should give notice to the clerk of the Commission that the house or building, or any part of it, was ready for occupation, and that the surveyor, on being satisfied that the building was fit for occupation, should grant a certificate to that effect. Any owner or builder failing to give that notice, and permitting of occupation before the certificate had been obtained, would be liable to a penalty of 40s. for every day during which the occupation was continued.

At the meeting of the Montrose Town Council, the action of the public hall committee in purchasing the old property at the top of Bridge Street as a probable site for the proposed new hall was sanctioned, the price being 2,500l. The property is of Flemish design, with the gable-ends facing the street, and comprises the old hostelry known as Union Inn, and the house where the late Dr. Robert Brown, the botanist, was born.

BETTER church accommodation is required at Rugeley, and alternative suggestions are made for the alteration and enlargement of the existing parish church, for the restoration of the ancient parish church, of which only the tower and chancel remain, and the provision of an entirely new church in a more central position. The vicar, Rev. A. Moncrief, has subscribed 500l., and a sum of 3,000l. is available from a bequest by Miss Hopkins.

At a special meeting of the Commissioners of the burgh of Stirling it was resolved to erect public baths and washhouses, and a public covered bathing-place and public drying-grounds, at St. Ninian's Well Green.

At the monthly meeting of the Leamington Town Council a letter was read from Mr. C. A. Walker, contractor, Grimsby,

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asking the Council to make him some compensation for the expenses incurred by him in tendering for a recent borough contract. Mr. Walker's contract was 70% lower than that which the Corporation accepted, and it was admitted that the only reason for the preference shown was that the successful contractor lived in Leamington. Mr. Purser moved that 5% be paid to Mr. Walker as compensation; but this was not seconded. Several members, however, expressed their conviction that the Council ought either to accept the lowest tender or to intimate in their advertisements that no outsider need apply.

OPERATIONS have been commenced for the demolition of the old Town House, Queensferry, one of the most interesting old structures in the burgh. This has been necessitated in consequence of the erection of a new Town Hall, which has been presented to the town by the Right Hon. the Earl of Rosebery.

It is proposed to build a theatre at Wakefield at an estimated cost of about 12,000£. The plans have been prepared by Mr. Frank Matcham.

It is estimated that it will cost nearly nine thousand pounds to repair the damage done to St. Mary's Church, Shrewsbury, by the fall during the late gale through the roof of the nave of about thirty feet of the lofty stone spire which was in course of repair. St. Mary's is the most beautiful of the ancient churches of Shrewsbury. An appeal for public subscriptions towards the restoration of the church is to be made.

VARIETIES.

THE *Glasgow Herald* says:—We understand that the erection of the basement floor of the new Art Galleries in Kelvin-grove Park is now being proceeded with. The discovery that the ground originally fixed upon as the site of the building was unsuitable, owing to the presence of a stratum of mud, delayed operations somewhat, but the new site recently granted by the Town Council has been found satisfactory in every respect, providing a complete foundation of solid rock as well as an admirable position for the building. The work will now proceed with all convenient speed.

It is stated that the Sussex Archaeological Society have received from the Earl of Chichester permission to excavate the galleries and chambers recently discovered beneath the castle at Hastings.

At the quarterly meeting of the Berwick Town Council the question of widening the old bridge spanning the Tweed at Berwick, at a cost of 4,000£, came up. Letters were read protesting against any alteration of the historic structure, and a petition signed by many, including Sir E. Burne-Jones, members of the Royal Academy, professors, Q.C.s, LL.D.s, authors and architects, stated that any alteration would destroy the character of this national inheritance. The Earl of Carlisle wrote that Berwick-upon-Tweed is the most interesting and picturesque town in Great Britain; to widen the bridge would be to ruin it. The subject was referred to a committee for consideration.

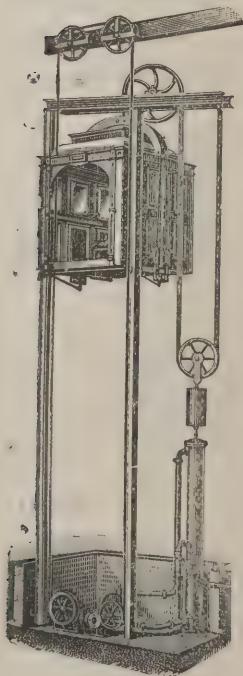
THE Hotel Victoria, Northumberland Avenue, opened less than seven years ago, very early established for itself a reputation as a comfortable and central stopping-place for visitors to London. The site of the hotel is one of the greatest historic interest, as any with antiquarian knowledge will be aware. It has just been purchased by the Gordon Hotels Company, and the fine tapestry decorations, which were executed by Mr. Boekbinder, have been touched up and restored.

THE Dewsbury and Heckmondwike Waterworks Board are about to construct two new reservoirs near Dunford Bridge. The estimated cost is 50,000£.

It has been decided to hold an autumn meeting of the Iron and Steel Institute at Brussels from September 4 to 7. The members of the Institute will thus have an opportunity of visiting the International Exhibition at Antwerp. Invitations have been received to visit Cockerill's steel works near Liège, Colonel North's cement works near Antwerp, and several other important establishments. The steel industry of Belgium is making rapid strides, and a visit to some of the new basic steel-works now being erected in that country will not fail to be an attraction to English ironmasters.

AT four o'clock on Tuesday last an extraordinary performance was given in the Imperial Theatre, Royal Aquarium, and we believe will be repeated daily at the same hour. It consisted of a lady dancing in a cage occupied by four lions. Mdlle. Walter claims to be the introducer and the first dancer of the serpentine dance performed in a den of lions. She has had a great success at the Gaiety and Eden Theatres, Paris. The lions, named Cæsar, Saida, Bobby and Lilian, are from three to four and a half years old, and are decidedly ferocious. At the Gaiety Theatre, Paris, they twice attacked their trainer, George Marcks, Cæsar on the last occasion leading the attack, and literally tearing Marcks' clothes to pieces, and he would

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Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on Tyne Parish Church
Sherborne Abbey	Widmore Church
Sydney Town Hall, N.S.W.	Eiffel Tower, Paris
Durban Town Hall, S.A.	Royal Military Exhibition, &c., &c., &c.

GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

have inevitably killed him had not Mdle. Walter fought the animal off. The attack was the more unexpected as the lion Caesar had been recently ill from sore throat, and had received the kindest treatment under Mdle. Walter's care. The show is one of the best to be seen in London. The Imperial Theatre, which is well lighted by a gas sunlight and gas all around, is suddenly placed in darkness, and the curtain rises amidst a blaze of light, disclosing four lions in an immense cage, occupying nearly the whole of the stage, with their trainer, who is engaged in subduing the most ferocious of the group. *Tableau 1.*—Mdle. Walter, handsomely attired, enters the cage, and amidst a blaze of light goes up to the lions, and after flourishing the scarf in the faces of the infuriated beasts, and going through a series of postures, implying an invocation to the lions, Mdle. Walter performs a scarf dance of incantation, during which the animals become subdued, and Mdle. Walter leaves the cage intact. *Tableau 2.*—The lady again enters the cage (this time in a silver and gold dress), and after going through a similar process of incantation to the lions, dances gracefully but with considerable animation a butterfly dance, during which mademoiselle flutters, as it were, butterfly wings in the faces of the lions. At first infuriated, the animals become calm, and allow the lady to leave the cage unmolested. *Tableau 3* is a serpentine dance, during which George Marcks, the trainer, is lost in the folds of the lady's dress, and for a time the lady is left apparently alone and at the mercy of the lions, and they becoming infuriated, Marcks reappears, and Mdle. Walter for the third time leaves the cage unhurt. *Tableaux 4.*—During Mdle. Walter's absence between the third and fourth tableaux George Marcks forces the lions through a series of hurdle-jumping, arousing the animals to a fury, amidst which, attired in a most resplendent silver dress, stated to have cost 4,000 francs, Mdle. Walter for the fourth time enters the cage, and with perfect *sang-froid* performs her celebrated serpentine dance, for which she is renowned. During this dance the lions become furious, and are kept at bay by George Marcks. At the conclusion of the dance, Marcks suddenly throws down his weapons of defence, and both Marcks and Mdle. Walter stand defenceless before the lions, who, strange to say, remain motionless before them, sheer force of courage and character emitted from the trainer's and Mdle. Walter's eyes keeping them from making an attack. With eyes rivetted on the lions, the lady and trainer retire from the cage. All Mdle. Walter's dresses are very handsome and exceedingly costly, and the

show has been brought from Paris at an enormous expense, where it has commanded as much as 200*l.* per week. The engagement of this costly exhibit is one of the most enterprising things that Mr. Ritchie has undertaken in connection with the Royal Aquarium.

ELECTRICAL.

At the half-yearly meeting of the Bristol Tramways Company Mr. W. Butler, chairman, said the directors could safely recommend the introduction of the overhead system of electrical traction between Old Meeting Street and Kingswood Hill. The accumulator system had been tried probably for the longest time at Birmingham, where one of the sections of the Central Company's system was worked in this way. As the result of a thorough test under the best possible conditions the system had been found not only excessive in cost, but uncertain and not suited to the requirements of tramway traction, so much so that the directors of the company had been compelled to propose its entire abandonment in favour of the overhead system. He was pleased to state that the authorities representing three-fourths of the length of route had already signified their unanimous approval of the Bristol company's proposals. This had been done after an inspection by the members of the local authorities of a similar installation at Walsall, Darlaston and Wednesbury.

At Derby, Mr. J. E. Stewart has been appointed engineer and manager of electric lighting works, with Mr. A. P. F. Moore as assistant engineer. It is recommended that the salary of the former shall be 260*l.* a year.

THE *Engineer* says corrosion of water-pipes and other underground furniture by the ground return of electric railways continues to be reported. The recent annual report of the Brooklyn Electrical Subway Commission states that discoveries of corroded water and gas pipes have been of late so numerous that there seems no escape from the conclusion that metal pipes of all kinds extending below the surface along the routes of the trolley cars are being in many places destroyed by the ground currents. The lead covering of the telephone cables in the subways is also suffering from corrosion.

THE *Standard's* Paris correspondent says:—Some very interesting experiments were made with M. Heslemann's electric locomotive on the railway between Havre and Benzeville. The representative of the *Temps*, who was present in the electric

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train, with many notabilities, says they travelled from Benzeville to Havre at the rate of 80 kilometres an hour, which is not more than that of the ordinary fast train. The return journey from Havre to Benzeville, notwithstanding a steep gradient which had to be climbed, was effected at the speed of 100 kilometres an hour.

PROTECTION FROM FIRE IN LONDON.

THE fire brigade committee of the London County Council have prepared a report on the necessity for additional protection from fire in the Metropolis. The committee explain that since the governing authority was entrusted to the Council there has been an increase of 1 fire-engine station, 53 fire-escape stations, 23 hose-cart stations, 3 hose and ladder truck stations and 2 permanent street stations, one raft steam fire-engine, 67 fire-escapes, including police ladders, 1 hose tender and fire-escape, 24 hose-carts and hose-rafts, 5 hose and ladder trucks, and 2 tugs, 2 rafts with steam-engines, 205 fire-alarms, 9,009 hydrants fixed or ordered, while the staff has been increased by 9 officers, 117 firemen, 7 coachmen and 1 pilot. They also point out that another fire-engine station (at New Cross) is now in course of construction; that new stations have been built in place of old ones at Wandsworth and Brompton, and that the Council has authorised the erection of a new station in substitution of that at Fulham, the enlargement of those at Clerkenwell, Kennington, Battersea and Mile End, and the erection of a building for the accommodation of a staff attached to the river station at Rotherhithe.

It has been recommended by the chief officer that instead of largely increasing the number of the fire-engine stations with the usual staff of an officer, five or six firemen and a pair of horses, it would be better to rely on an augmentation of the number of men stationed at comparatively short distances apart with hose-carts and fire-engines. He suggested that new stations should be built in place of the Notting Hill, Paddington, Islington, Portland Road, Shoreditch and Lewisham stations; that the proposal to establish a station near the Law Courts should be abandoned, that the Watling Street Station should be given up, and that in place of these two a large station should be built at the eastern end of the Victoria Embankment, close to Fleet Street and Blackfriars Bridge; and that the river station at Shadwell, which is too near the floating station

at Rotherhithe, should be removed further eastward. After careful consideration the committee endorsed all the recommendations except that relating to the Notting Hill station, and the decision had been reported to and approved by the Council as far as the stations in the City, and at Paddington, Islington, Shoreditch and Lewisham are concerned. They had, however, not yet been able to submit a recommendation with respect to the Portland Road station, or the river station at Shadwell. The chief officer also recommended the establishment of a river station at Battersea, of three or four fire-engine stations, and about thirty sub-stations and street stations, an increase of about thirty in number of hose-cart stations, and about ninety fire-escape stations and, further, the placing of steam fire-engines at some existing stations unprovided with them. The Council has recently authorised the addition, consequent on the establishment of the Dulwich and New Cross fire-engine stations, of one street station, three escape stations, and two hose-cart stations. The committee recommend the establishment of an additional station at Battersea Rise, additional fire-engine stations at Shepherd's Bush, near St. John's Park, Blackheath, and that on the completion of the building the existing station at Tranquil Vale, Blackheath, be utilised as a sub-station at Perryvale, at Streatham, and at Battersea Rise and that a sub-station or a street station be established in each of the following localities:—North End Road, Fulham; High Road, Kilburn; West End Lane, Hampstead; King's Cross; Caledonian Road (about the centre); New North Road, Islington; Piccadilly Circus; Strand (near the Law Courts); Gloucester Road, Regent's Park; St. John's Park, Holloway Road; High Street, Homerton; the Triangle, Mare Street, Hackney; Burdett Road, Limehouse; Millwall Dock entrance; North Woolwich; Eltham; Lee Green; Scandinavian Church, Rotherhithe (near); Camberwell New Road; Walworth Road; Herne Hill; Brixton Hill; Priory Road, Lambeth; Battersea Park Road. On the establishment of a sub-station or a street station at Piccadilly Circus, the existing fire-escape stations in Piccadilly and Golden Square will be given up; on the establishment of a sub-station or a street-station in the Strand, near the Law Courts, the existing hose-cart station at St. Dunstan's Church, Fleet Street, close to Chancery Lane, will be given up; on the completion of the new Lewisham fire-engine station the existing station at Rushey Green, Catford, will be utilised as a sub-station. The committee share the chief officer's opinion that men should be on duty during the day at all street stations,

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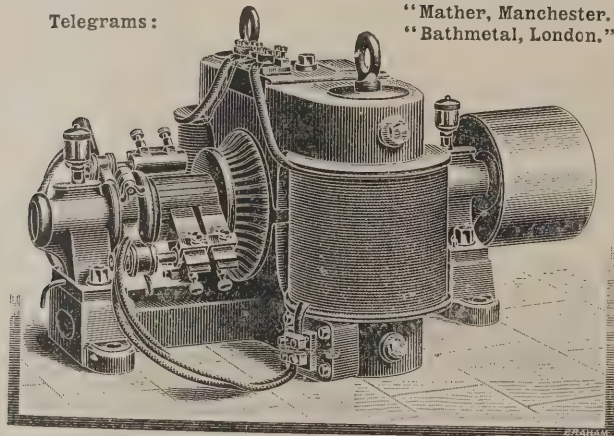
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and they recommend this with respect to Spa Road, Bermondsey, and Vauxhall Cross street stations, and that the stations be in each case placed in telephonic communication with the nearest fire-engine station, and that the fire-alarms be thereupon dispensed with.

The committee submit a rough estimate of the cost of the scheme. They put stations (ground and buildings) at 81,000*l.*, and appliances and gear at 11,570*l.*, making a capital outlay of 92,570*l.* Maintenance figures in the estimate at 24,300*l.*, being 19,250*l.* for staff (pay, clothing and medical attendance), and 5,050*l.* for other charges. The committee point out that the annual amount to be raised to provide for the redemption of capital and the payment of interest at 3 per cent. would be 4,751*l.* 18*s.*, which, together with the additional annual expenditure for maintenance, is equal to a rate of less than a farthing in the pound. The committee are satisfied that the needs of the large area within the Council's jurisdiction require a substantial augmentation of the staff and appliances of the brigade, and, as they believe that the ratepayers of London would willingly bear the cost which such increase would involve, they submit the recommendations, assured that the Council will give to them that consideration which the importance of the subject demands.

THE L.C.C. AND ITS WORKS COMMITTEE.

THE apostles of the direct labour doctrine on the London County Council, says the *Local Government Journal*, cannot be congratulated on the sorry figure which they cut by the first and last tabulated statement of results of doing away with contracting. The details of fourteen works have been given with a great flourish of trumpets, after we had, week in and week out, repeatedly challenged the committee to produce their accounts. It was shown on Tuesday how, on estimates amounting to 20,900*l.*, over 2,000*l.* had been saved. The smartest stroke of business was averred to be in respect to foundations for certain cottages, a work for which the contractor had, according to the Council, asked too much. The committee claimed to have saved nearly 2,000*l.* on the estimate, but Mr. Lyon, their chairman, hastily knocked away this, their only leg to stand on, by stating that, after all, the work was not completed, and the cost was not at present ascertained. Thus it comes about that the return was wholly misleading, and that the claim to have saved money on the estimates fades into nothingness, especially beside the fact that, on the committee's

own showing, the erection of a lodge and convenience at Plumstead Common cost 24 per cent. over the estimate.

Even supposing that it were possible to congratulate the committee on its work, we could not do so on its tabulated statement, inasmuch as it is erroneous from beginning to end. It is impossible to place faith in any of the figures when the most important are avowed to be incorrect, and ought never to have been placed on the table. The publication of these financial blunders has, however, been received with great joy by the faithful, not one of whom had the courage to state that the figures were merely approximate and could not be trusted. But it would be interesting to know why they were ever placed in the column; was it to gloss over extravagant expenditure and to prove the contractor to be an extortionist, or was it to give an untruth a good start and so make it impossible for the real truth to catch it up? Surely some one must have known that the work was not completed. It certainly does not look like an honest statement when the only favourable item of any importance, and the only one which stands in competition with the contractors, is admitted by the chairman of the committee to be wrong. For its own protection the Council framed a series of regulations for the committee, providing that, after a job had been measured up, the receipts and vouchers for all costs should be placed before the comptroller, whose duty it would be to check them, and, finally, to pass them on to the finance committee. This regulation the committee have ignored altogether; and, further, they have long ago completed jobs which do not appear in the statement, nor have any particulars yet been given. The committee have totally ignored all interest on capital expended in purchasing the wharf, and the enormous quantity of plant and timber which is now stored at the wharf. Some of the jobs, too, have occupied a longer period than would have been occupied by a contractor; while, if we come to Westminster Bridge, which was painted to provide work for the unemployed, and upon which five coats of paint were put, we find a stupid waste of money. However much the Council may desire to do all they can for the workless, they have no right to incur wanton expenditure by undertaking such work as painting when climatic conditions are all against it. At the same time, we are bound to say that the work was well done—probably better than it ever had been before. But it could be equally as well done in the spring at a great deal less cost, as, owing to the dirty and windy weather, an extra coat of paint was put on the parapets.

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bound to confess the utter inability of the Council to undertake special skilled work. The establishment charge of 5 per cent. which is put down is held by those best competent to judge as being very much below the mark; in fact, at least 50 per cent. below what it should be. The column relating to the use and waste of plant is wholly misleading, and gives no accurate notion of what plant has been wasted, what has depreciated in value, and what the value of it was which was used. The Council should not delude itself into the notion that every summer will be like the last. They will find that in constructing the Fleet storm-sewer, that if it should be a wet summer there will be a heavy charge for pumping, a charge which was absent when the York Road sewer was constructed, on account of the dry season. Another friend of the committee who has, in season and out of season, supported the principle of direct labour, declares his belief as a member of the Council that there were some small works which the contractor could do better than the Council; while another, who is a practical builder himself, and an enthusiast of the principle of direct labour wages, contends that the Council must leave all special skilled work severely alone. The Vice-chairman of the committee admits that the committee were asked to send in prices for work before they were ready to do so; hence the high prices. Mr. Alderman Taylor confesses that, so eager were the advocates of direct labour to put the system in force, that they compelled the committee to do their joinery by hand, a process which entailed a great loss compared with a contractor's price, while an enormous sum has been wasted in buying and stacking timber for seasoning, a waste equal to 5% and 10% per standard, which need not have occurred if the system had been initiated with cautiousness and care.

There is only one method in which we can get to understand whether the ratepayers are getting a *quid pro quo* for their money. Let the works committee, compete in every job with contractors, and if the latter beat them we may surely give up the works department as a white elephant which was conceived in ignorance and born of fatuous folly, for, assuming that all establishment charges are taken into account, and that even the proportionate interest on capital is allowed, the works committee have not, like the contractor, to earn a living, so that in every case they should be at least 20 per cent. below the contractor. But the works committee are too wily to put their offspring into honest competition, especially after the Parliament Fields refreshment-house revelation. It would prove too much and be distasteful to labour.

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THE NEW SUBTERRANEAN GOODS STATION.

NONE of the great railways, on their first introduction into the metropolis, had originally, says the *Standard*, made adequate provision for the wonderful increase of goods traffic that has since been developed. The Great Northern, however, were not wanting in forethought, and still possess some further room for expansion. The competition of other lines also influences their action, and necessitates additional accommodation for the delivery of goods inwards and the reception of goods outwards on a scale not inferior to that provided by their rivals. About fifteen years ago they obtained a footing in Farringdon Street, and the immense warehouse in Charles Street abutting laterally on the Farringdon Road has been gradually expanding ever since. When the London, Chatham and Dover Railway burrowed out the ground from one side to run their passenger trains alongside those of the Metropolitan Circle system, the Great Northern dug out the bank on the other side of the cutting, and added an acre and a quarter of underground works to their Charles Street Station, extending up to the familiar chimney at the Vine Street bridge leading to Clerkenwell. For some years there has been a vast and more or less open space extending from Charles Street south to Charterhouse Street. Part of it has been built over by the new markets; and contractors' and other works have of late been gradually obscuring the rest from view. This area of 3½ acres has been excavated to a depth of some 25 feet below the street level, and the ground abutting on to Snow Hill is now one uninterrupted subterranean station, with numerous lines of railways and sidings, platforms, cranes, capstans, lifts and appliances, with cart roads meandering in all directions for the conveyance inwards and outwards of goods. The whole of this has been almost

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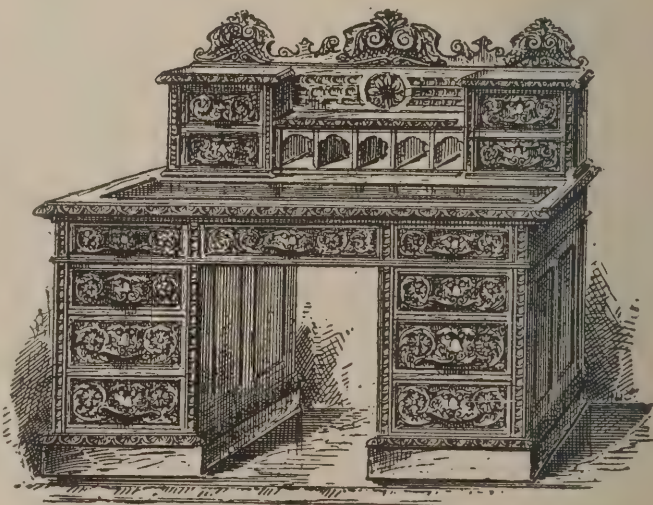
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entirely roofed over by iron roofs, which form the floors of the superstructures of the edifices erected on this basis at the old ground level. All these operations, too, have been executed without stoppage of the public vehicular thoroughfares. Of the magnitude of some of the undertakings, the steel bridge which supports Charterhouse Street is one example, being 150 feet in length by 60 feet in breadth. Under Charles Street is another steel bridge 60 feet long by 40 feet. From a subterranean platform under the new vegetable market, alongside which the railway trucks are run, two hydraulic hoists will carry up on suitable barrows the packages of fruit and vegetables as they arrive. In the new subterranean station there are five capacious platforms—two nearly 200 feet in length—with appropriate sidings and turntables adjoining. The whole floor of the station is paved with granite. Access to this is provided by two inclined roadways—one from Charles Street, on the north-west, and one from Snow Hill on the south. All the cranes and machines are worked by hydraulic power, the water being delivered for work at 700 lbs. pressure to the square inch. The old hydraulic station at Vine Street is being enlarged to treble its present capacity; and shortly the whole underground area of five acres in extent will be illuminated by electric lights, served by the company's extensive generating station at Holloway.

There are novelties in the construction of this underground station that are well worthy of notice from the engineering point of observation. Hitherto the stanchions or supporting pillars intended to carry spacious superstructures and ponderous loads of goods stored in them have been universally formed of plate-iron or steel, rivetted together as a square pillar, into the interior of which no eye could peer, and consequently no certainty exists as to the actual serviceable condition of the pillar. By a very ingenious device the stanchions in the new station are in the form of two double T girders crossed, and in this way the whole of the iron surfaces are exposed to examination, and can be easily scraped, painted and preserved. Another very noticeable feature is the way in which the ends of all the horizontal roof and other girders are let into the tops of the stanchions and rivetted therein at right angles to each other, so that the whole of the immense overhead network of girders is tightly and securely combined into one substantial whole. The bases of the steel stanchions, which are splayed out at the bottom to about 4 feet square, have a firm resting on concrete and brick foundations, which are 12 feet square where they repose on the solid ground below. But the wonders

of the new Farringdon Street works do not end underground. The effort to give ground-level accommodation to the commercial traffic has never been so fully attempted in any other station. Carters do not like working their horses and loads on inclines. The façade of the new warehouses and offices in progress of erection will face the former warehouse of the Great Northern and the Metropolitan Circle Railway Station in Charles Street. It will have entrances for carts from the roadway, and its remarkable feature is that all these will be served from fourteen bays, in direction north and south, disposed on each side of a "traverser" way running east and west. At one end, the eastern, are two hydraulic lifts, each of which will lift a railway goods truck from the subterranean station to the ground-level station above it. The "traverser" is a platform on wheels worked to and fro in the direction of a line of rails on each side. Thus, when a goods truck some 20 feet long and 8 feet or 10 feet wide is brought up by the hoist, it is run off from it in the direction of its length on to the "traverser," which is then worked forward to the particular bay where it is wanted for unloading or loading. It is then run off the "traverser" on to the platform at the bay referred to. The "traverser" then returns to its station by the lift and acquires another truck, which it moves off with to another particular bay. It is in this way that the trucks can be sorted, moved into place, and taken away again in the most simple and expeditious manner. The drawings of the new façade show a general front in buff and red bricks, with one line of windows above the door entrances; but the erection has not yet reached to the latter elevation. The new underground station has already been partially brought into use, and seems likely to be accepted as a great public convenience. It will save the cartage from Charles Street to King's Cross, and will gain custom from Tooley Street, Bermondsey, Southwark, and all the goods districts on the south side of the Thames, as well as serve the Aldgate and Leadenhall Markets. The merchants of the busy parts in Cannon Street and Aldersgate, and their surroundings, will benefit largely by the change, and the local meat and vegetable markets will gain increased supplies and more expeditious deliveries. The brick boundary wall on the eastern side of the site, abutting against Farringdon Road, will for the present remain, and any further advance on that side is postponed.

The new works have been designed by Mr. R. Johnson, the engineer in chief of the Great Northern Railway, and their execution has been under the direction of Mr. John Tunstall.

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ELECTRIC LIGHTING OF LONDON.

ON the 9th inst. Mr. A. Siemens presided over an ordinary general meeting of the members of the Institution of Electrical Engineers, when Major-General C. E. Webber read a paper on "Some Notes on the Electric Lighting of the City of London." There was a large attendance. The lecturer traced the history of the initiation of the light in the City, and claimed that the City of London took the lead in making a practical experiment on a large scale. Much encouragement was afforded by that experiment, but although the City was one of the earliest areas upon which the electric light manufacturing companies set their eyes, the general tenor of the recommendations in 1883 was that the Commissioners ought to obtain their own provisional order of license, and this was done. No public body probably had taken more pains than the City Commissioners to weigh carefully the pros and cons bearing on the question of their becoming themselves the undertakers for supplying electricity, and but for the host of offers, merely speculative or otherwise, continually sent in to them, they would in the end have decided on raising the necessary capital to do the work themselves. There was no doubt that the ratepayers of the City would now be in quite as good a position if no provisional orders had been granted. The Commissioners were roused finally to activity in January 1889 by the Electric Lighting Act of 1888, and the City having been divided into three districts for the purpose of the contracts, tenders were publicly called for. The lecturer then described the results of the advertisements, the difficulties which the accepted contractors had to meet, and the processes which they adopted, and in conclusion he paid a cordial testimony to the staff which carried out the work.

REGISTRATION OF PLUMBERS.

AT the fourth annual public meeting of the Leeds District Council for the National Registration of Plumbers, presided over by the Mayor of Leeds, Mr. W. H. Bishop (past master of the Worshipful Company of Plumbers, London), in proposing the election of the members of the Council for the year 1894-95, said:—

Right Worshipful Mayor, Councillors and Gentlemen,—I have the honour of submitting to you the resolution by which the district council for Leeds will receive election for the year.

As you are aware, the constitution of all our councils and committees is—one-third master plumbers, one-third operative plumbers, and one-third the representatives who are charged with the interests of the general public. It is, I believe, a unique instance of confidence in the common appreciation of a movement by which the public are to be protected, that the masters and operatives in the craft invite the qualified representatives of that public to share in the control of the measures by which their trade organisation is governed. If the masters had any separate purposes of their own, the operatives are present to check such a tendency. If both sections of the craft had any exclusive trade interests to serve, the public representatives would no longer feel any interest in the work. The harmonious relations of the three sections of the Council indicate the bond by which all are tied—the public welfare. And what, gentlemen, is the result? This is your fourth annual meeting, and each year tells of steady progress. I see the same names as supporters of the organisation, while in all important details you increase in importance. Your students show better results. The Right Worshipful Mayor spoke of your friends and of your flourishing condition. So far as the schools are concerned, the ability of the teacher is evidenced in the number of prize-takers and the quality of their attainments. The devotion of the teacher needs no praise at my hands. He is a volunteer, and a debt of deep gratitude, in addition to a pecuniary acknowledgment which he deserves, is ours to him. It is a source of great satisfaction to me, on behalf of the Worshipful Company of Plumbers which I represent, to welcome that one of your students who, on passing in honours, becomes entitled to the honorary freedom of the Company. Such accessions to our members carry with them evidence that good is being done, and that the roots as well as the branches of what is more than a City Company are extending all over the country.

In your examinations of candidates for registration I observe, by the first report, that you had remitted fifteen for examination, three of whom passed. In your succeeding reports I find that of those remitted for examination, none passed. These facts show, gentlemen, that your Council has performed its duty with as much care as discretion. If you had exercised less care or had been influenced by any external considerations, the result could not have been so completely satisfactory. It would be a mistake to suppose that the small number of "passes" is in any sense a reflection upon the severity of the examinations. It simply indicates that the

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subjects sent for examination were men whose qualifications had not been proved, and the result of the examinations justified the Council in submitting the candidates to that ordeal. The health and lives of the community are, to a large extent, in the hands of the plumbers, and it is the duty of the Council to ascertain that the holder of a certificate is a competent craftsman. You inculcated the true teaching on this subject in your first report, when you said:—"It is the duty of each registered plumber to uphold the honour of his craft by taking an honest pride in careful workmanship," and the report adopted at your meeting to-day is an earnest of your successful efforts.

Your president, Mr. J. Wreghitt Cannon, has spoken of the museum of plumbing proposed to be established. There is deep philosophy in his remark that "we learn more from our failures than from our successes." It is best, as he proposes, to exhibit examples of bad plumbing. Those who see bad work will go home wiser and better instructed than when they came out, and will look after and watch the work done in their own homes, to their own advantage and to the satisfaction of the plumber, who will realise that good work is appreciated.

Some of those who have addressed you this day have spoken of bad plumbing and of bad architect's work. It is well to remind you that the builder has much to do with the aspersions levelled alike at architects and plumbers. In many cases an architect is not consulted, and the plumber is simply told what to do. The development of the registration movement will, I hope, alter this. The plumber should have control of the plumber's work, and I hope the day will come when he may safely count upon public support, and refuse to do what he knows to be work calculated to render a house unsafe to the health of those who may dwell in it.

I have a few words to add relative to the Plumbers' Registration Bill, which, as you know, failed to pass this session. Referred to the Standing Committee on Trade, it met with insufficient attention. No witnesses were examined, and the statements made raised an unfair prejudice against a measure by which the plumbers, masters and men, in a voluntary organisation ask protection from Parliament in the exercise of their own efforts to protect the public from injurious plumbing work. When the Bill passes everybody will be free, as he is now, to engage unregistered men. But those who are voluntarily registered will have legal control of those who are members of their own organisation, and will prevent unauthorised workmen from pirating their name and title.

There is in connection with your craft power residing with the county councils to raise and apply money to technical instruction. I venture to commend to you to make clear to the county councils that plumbers need special instruction which cannot be acquired in classes common to all students. This should be an easy task, and it is demonstrable that money applied to the special teaching required by plumbing students will return results to the community exceeding that applied to other trades. A good plumber can prevent disease in many matters that relate to his craft, and if he contribute to the healthiness of home he will repay all the money expended in his training.

LIST OF REGISTERED PLUMBERS.

London Journeymen.

HANNAWAY, J. N., 24 Queen's Terrace, Wandsworth Bridge Road, S.W.

MARSH, W., 4 Claybrook Terrace, Hammersmith, W.

SHERVILL, J. A., 1 Arthur Villas, Queen's Road, Teddington.

Provincial Masters.

AKED, F., 1 Carlton Terrace, Halifax.

ALLCOCK, T., 18 King Street West, Stockport.

BOLTON, J. H., 66 Gibbet Street, Halifax.

CALVERT, A., 15 to 17 Otley Street, Skipton.

CALVERT, C. G., German House, Lightcliffe, near Halifax.

FAWTHROP, E., 65 Haley Hill, Halifax.

FAWTHROP, S., 65 Haley Hill, Halifax.

HALEY, W. T., Scholes, Cleckheaton.

LAWSON, J., Commercial Street, Brighouse, Yorks.

NAYLOR, J., 15 and 17 Cheapside, Halifax.

NAYLOR, W. E., 15 and 17 Cheapside, Halifax.

WARD, W., 14 Broad Street, Halifax

and

BLOOMFIELD, H., New Westminster, British Columbia.

Provincial Journeymen.

GOODALL, A. D., 37 Lady Menzies Place, Edinburgh.

GRAY, G., 16 Lemon Street, Halifax.

HARGREAVES, H., Hammerton Grove, Lowtown, Pudsey, Leeds.

LISTER, A., 8 Northcote Street, Edinburgh.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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STREET CAR PROPULSION.

THE Metropolitan Traction Company, of New York, have offered a prize of 50,000 dols. to any inventor who will by March 1 submit a system of street car propulsion, equally efficient with a trolley or cable system. The selection is left to the Railroad Commissioners. In their communication the company say:—

During the past year we have made a very successful test of the cable on Broadway. The net result of this experiment is that, although the times are very dull, there being a falling-off from 10 to 15 per cent. on all local traffic, there is a uniform gain on this line, and before the year ends the indications are that, in comparison with the previous year, when the road was operated with horses, the cable road will show a gain in traffic of not less than 25 per cent. and a saving in the expense of operation of more than 20 per cent. This total gain to the company of 45 per cent. is a large item to consider, and there need be no cause for wonder why the large prize of 50,000 dols. has been offered to the inventor who will present to the Railroad Commission the best system of motive power other than the trolley. Although little appears in the correspondence to indicate that any particular kind of power is desired by the company, yet it is understood that any particular storage battery system which can be operated as cheaply and as successfully as the overhead system is not sought after. The proposition which the company makes to the Railroad Commission is set forth in the following extract from the correspondence:—

1. We will set aside the sum of 50,000 dols. to be awarded as a prize to any person who shall before March 1, 1894, submit to your honourable board an actual working system of motive power for street railway cars demonstrated to be superior or equal to the overhead trolley.

2. The qualities necessary to meet this requirement shall be left to your decision, but with the present state of art a system to win the award must necessarily approximate the trolley as a standard of economy in operation, but should be without the features objectionable to the public that are in it.

3. We shall exact no rights in the invention in return for the 50,000 dols., and shall have nothing whatever to do with the making of the award, further than to pay any expenses which your honourable board may deem it necessary or wise to incur, either in the employment of experts, the giving of hear-

ings or the conduct of experiments, this in order that no effort may be spared to achieve the desired result.

We desire, however, to suggest to your honourable board that any invention worth considering will ordinarily have inspired sufficient confidence in an inventor and his friends to warrant them in paying the expense of an experiment, provided facilities are furnished therefor. If we are asked to pay the expense of experimental forms of traction not sanctioned at present by any general use, we should desire to be consulted as a necessary precaution against visionary and unjustifiable expenditure by our company.

The advantages which would accrue to an inventor from the finding of your board in his favour, and the adoption of his system by our company would be so great that we do not consider it necessary to stipulate terms for its use on our lines, especially in view of the fact that, in the event of exorbitant demands, it would remain in your power to take such action as in your judgment would be necessary for the protection of the public. As the proposal itself plainly indicates, our faith in the capacity, judgment and fairness of your board is such that we feel warranted in practically placing the whole matter in your hands and leaving the decision of any questions that may arise to your discretion.

Permit us to say, in conclusion, that in submitting this proposition we make no pretence of disinterestedness. Our motives, while not altogether selfish, are those of business. We do feel justified, however, in suggesting that in this matter at least our interests are identical with those of the city.

ELECTRICAL ENGINEERING.

At the meeting of the Northern Society of Electrical Engineers held at the Palatine Hotel, Manchester, Mr. C. E. Preece in the chair, Mr. John Hesketh read a paper descriptive of the plant and system adopted for the electrical installation at Blackpool. He stated that so far back as the year 1879 Blackpool first tried electric lighting by means of Siemens's arc lamps, each run from a separate dynamo. The character of the work then done was indicated by the fact that the original dynamos and lamps were burning until August last. The demand for a more general application of electricity to both public and private purposes called for an extension of the scheme, and the Blackpool Electric Lighting Order, 1890,



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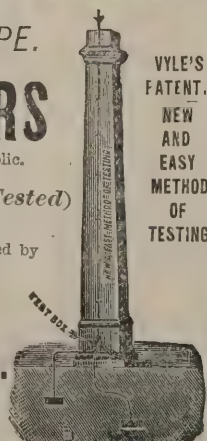
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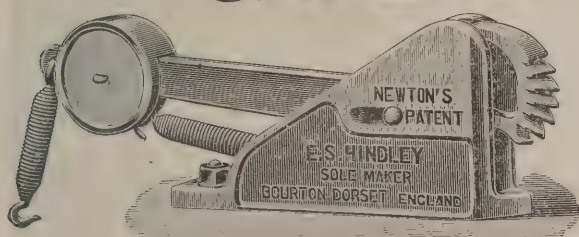
granted powers to the Corporation to lay down works for the supply of electricity from a central station. The town was long and narrow, and it was therefore decided to adopt the high-tension system. The building in which the plant was erected was on land which furnished ample room for extension. Details were given with regard to the boilers, engines and dynamos. The distribution, it was explained, was done by means of cables insulated by vulcanised indiarubber. These were drawn into 3-inch cast-iron pipes, as many as six cables being drawn into one pipe. The furthest point at which a supply was given was two miles distant from the station. The street boxes were of iron or brick, with cast-iron covers, and as the high tides came so frequently over the promenade it was useless to try to keep the conduit dry. No difficulty was experienced, however, in working with the cables under water. The public arc lamps were erected on pillars of a design which was a modification of that in use in the main thoroughfares of Paris. The lamps were burning steadily and well, despite the high winds recently experienced. Transformers were placed wherever possible to feed three or four consumers, but in many instances this was not possible and a separate transformer for each consumer was fixed. A considerable extension of the works was at present in contemplation.

THE GERMS OF THE AIR.

A LECTURE was delivered at the Leeds City Fine Art Gallery by Dr. Julius B. Cohen, of the Yorkshire College, on "The Germs of the Air." The lecturer began by saying, says the *Leeds Mercury*, that until the beginning of the present century physical science directed the minds of philosophers mainly towards the study of the infinitely great—the discovery of new worlds in space, the study of universal gravitation, and the measurement of the velocity of light. The present century had illumined a new path in the Dark Unknown. The science of to-day was essentially the science of the infinitely small. Dalton's atomic theory—a theory of the invisible atomic structure of matter—was the foundation of modern chemistry and physics. The germ theory of disease—a theory which involved the existence of the microscopic living matter dwelling within and around us—was the basis of modern pathology and surgery. Having explained that the discovery of those living particles—which were so small that it was probable that many

of them defied the scrutiny of the most perfect microscope—originated in the study of the process of fermentation, Dr. Cohen referred to the work of Pasteur in this field of inquiry, remarking that the researches of Pasteur formed one of the noblest services man had rendered to his country. By means of slides the lecturer exhibited on a screen a number of drawings illustrating the observations of M. Miguel in the observatory of Mont Souris, on the outskirts of Paris, as to the composition of the air of that city. These experiments, he said, were directed to determining the number of vegetable spores, fungi and microbes in the air in various places and at various seasons of the year. Miguel had determined the amount of vegetable matter and microbes in the streets, bedrooms and living-rooms of Paris and the environs. One was struck with the great rarity of those minute beings, and the difficulty of distinguishing them was increased by the fact that they appeared to vary in shape with the nutriment in the matter on which they grew. It was certain that at least a few produced disease, and it was equally certain that a large number, when inoculated into animals, were harmless. That those harmless ones served a useful purpose in carrying on putrefactive change—acting as scavengers for the world's refuse—seemed not unlikely, but the subject was still in its infancy, and one upon which, no doubt, fresh light would fall as bacteriological research progressed. The number did not seem to vary proportionately with change of temperature, but if they compared the rainfall with the number of microbes, they saw at once a rapid diminution. The rain evidently carried them down to the earth. But they were far from being destroyed. The moisture seemed to assist reproduction, and it was found that there was a rapid increase directly after rain. If a drought was long-continued, they fell off again, because they died. The number of microbes in the streets of Paris was in the average about 21 or 22 in the cubic foot, and that agreed with that found in the streets of Dundee, namely, 20 in the cubic foot. Outside Paris the number fell off to 2; whereas in dirty, one-roomed houses in Dundee 3,430 had been found, and 3,170 in a neglected hospital ward in Paris. They could not be surprised that the washings of the air by rain accumulating in the mud of thoroughfares should be a gathering-ground for microbes. The mud of streets did more than that. It provided food for their growth. It was the great source of bacterial propagation. When they opened their windows on a dry, dusty day, to let in fresh air, they were welcoming those small visitors. It might appear judicious to keep their windows closed under such

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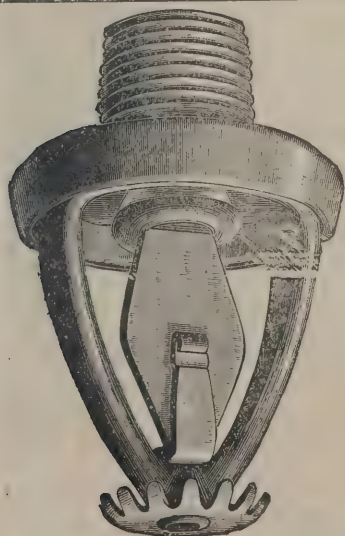
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a siege, but a moment's reflection solved the difficulty. They did not know to what degree those microbes were mischievous, but they did know to what extent a fresh supply of oxygen was necessary to health. Let them admit air, but keep their dwellings as far as possible free from dust. An idea of the great army of microbes which were constantly on the march out of a big town might be gathered from the number computed for Paris, namely, 40,000 millions daily. Subjects of importance in this connection which might be dealt with were the possibility of reducing domestic smoke, the smoke of our warehouses and office buildings, the better utilisation of coal and the use of gas for household purposes. He would specially impress upon his hearers the value of pure air as indispensable to health. They should not be like people sitting in a close room, and by gradually becoming accustomed to their surroundings, grow oblivious to the polluted atmosphere they were breathing and the poison they were breathing. A chairman at a lecture once said he thought too much was made "of these invisible things; we seem to keep alive in spite of them." His answer to that was that they did not want merely to keep alive; they wanted to live without the burden of trying to keep alive. Impure air, whether it arose from bad gases, soot, or disease germs, was a poison. If the health of a town was slowly undermined, as it was assuredly by causes which they could compass and prevent, they must face those causes and stamp them out. There was much that the local authority could, and ought to do, and which they should collectively see was done, but there was much that they, as individuals, should do themselves.

SOCIETY OF ENGINEERS.

THE first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, February 12, at the Town Hall, Westminster. Mr. W. McIntosh Valon, J.P., the president for 1893, first occupied the chair, and presented the premiums awarded for papers read during his year of office, viz. the President's gold medal to Professor V. B. Lewes, for his paper on "Gas Substitutes;" the "Bessemer Premium" to Mr. R. Nelson Boyd, for his paper on "Collieries and Colliery Engineering;" a "Society's Premium" to Mr. E. G. Mawbey, for his paper on the "Leicester Main Drainage, &c.," and "Society's Premium" to Mr. Robert Carey, for his paper on "Hydraulic Lifts."

Mr. Valon introduced the president for the present year,

Mr. George A. Goodwin, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year.

The President having taken the chair, prefaced his address by referring to the satisfactory progress and condition of the Society, stating that its position was better than it had ever been, and that the *raison d'être* of its existence was a worthy and a much appreciated one, viz. to hold out a helping hand to the younger members of the profession, to offer them special inducements in taking part in the discussions on the papers read at the monthly meetings, and the making of the annual summer visits to works of engineering interest under construction or completed, where again useful information was obtained and of special value to the younger members.

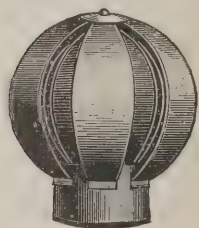
After referring to last year's visits and the work of the Society, he commenced his address proper, which dealt with the present position and practice of mechanical engineering.

Boilers being the most usual form of apparatus whereby motive power is obtained to put all machinery in motion, he naturally dealt with them first, pointing out rapidly the growth up to the present types, viz. Lancashire, Galloway, marine, locomotive and water tube, &c., and mentioned the chief points in each, both in construction and working, recommending mild steel of a certain quality and properly tested for strength, ductility and temper.

Feed heaters were then dealt with and their great advantages pointed out, the live steam-pipe being particularly referred to, as also the probable reasons for its efficiency.

Mechanical stoking was described under two heads, viz. sprinklers and coking, the latter of which he considered gave more perfect combustion. The smoke nuisance was then discussed, and suggestions thrown out for its abatement, the ordinary household grates being responsible for 95 per cent. of that due to the 4,000 tons of fuel burnt daily in London alone giving probably 3,000 tons of carbon thrown into the atmosphere.

Steam-engines came next in order, and after describing the probable first application of heat to doing work 2,100 years ago—when the doors of temples were opened and shut by the placing or removal of fire on an altar—some of the various forms of engines and valve gears were mentioned; efficiencies, both thermal and mechanical, were alluded to, and examples of the best results were given, for the former 12.05 lbs. of water per one horse-power having been reached, while 94 per cent. for efficiency.



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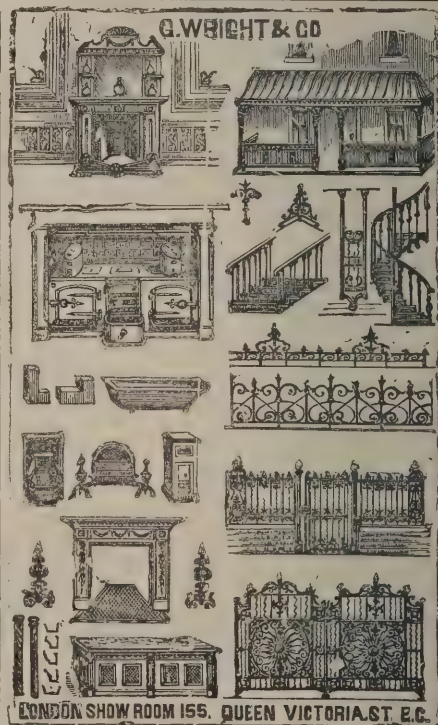
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Internally Fired Engines: Gas and Oil.—The many improvements made in recent years, culminating in the use of ignition tubes, self-starters, better thermal efficiency and larger powers were described. Questions such as late ignitions, scavenging, varying explosive charges as against cutting out, coupled engines and compounding were discussed as far as time would allow. Single cylinder engines were now made up to 160 indicated horse-power, while multiple went as high as 600. The consumption of gas had been reduced to 15 cubic feet per horse-power, while 10 lbs. is stated to have been reached, which, if worked by Dowson gas, only represented .8 lb. of coal per horse-power per hour. Mechanical efficiency of these engines could be taken as 80 to 85 per cent. at full power. While in 1860 the thermal efficiency was only 4 per cent., it was now 26 per cent. As an example of high running powers of gas engines, the President referred to an engine he had seen where 800 explosions took place per minute, e.g. 1,600 revolutions. With regard to oil engines, their action was described and results of tests carried out by reliable engineers referred to, the largest engine yet made being 90 horse-power.

Marine engineering was fully commented on, the first steamer of the P. and O., 1829, of 206 tons and 6½ knots speed, and some of the Atlantic liners being those chosen as a basis for review. It was mentioned that while one ton of coal in the *Iberia*, 1837, propelled 17 tons 221 miles a day, one ton in the *Campania*, 1893, propels 28 8 tons 601 miles in the same time; also that in the former 5 6 lbs. of coal were used per indicated horse-power per hour, the latter only required 1 5 lbs., while 1 17 lbs. had been reached in another vessel.

The President then fully dealt with artificial draught, but chiefly Howden's forced and Ellis-Eaves induced, and gave results of working, whereby it appeared that with either the power of the boiler can be doubled with safety, as much as 22 indicated horse-power being obtained for each square foot of fire-grate, so that space is saved and cargo-carrying capacity increased, less firemen required, and an inferior coal could be used. The advantages and disadvantages of each were commented upon; the former, however, he considered, favoured the Ellis-Eaves. Its application to land boilers and central power stations was also dilated upon.

Railways.—Here the President referred to most of the chief details in connection with the system, viz. rails and fastenings, including the permanent security of the keys, which had never yet received much attention, style of carriages,

carriage lighting and heating, locomotives and their developments, including compounding and use of liquid fuel, variable blast pipes, and test for tyres and axles.

A review of iron and steel manufacture was next dealt with, pointing out where developments had taken place in heating, handling and output.

Electricity followed on, and references made to its various applications, including that for printing the daily and weekly papers when power was only required for short periods per day, saving initial outlay, space, attendants and firing-up losses. Suggestions were also made that electric light companies should sell current for power purposes at any time of day or night at a reduced charge. Electric cable and steam traction was then reviewed, as also the particulars of the systems and costs of working.

Water-power and dredging plants of modern design were described, and, lastly, a short statement of refrigerating machinery developments was gone into.

In conclusion, he gave a few words of advice to the younger members who had elected to follow the noble profession of an engineer, recommending a sound practical training by day with theoretical study in evenings; to follow up some specialty to the hilt, but at same time to obtain and maintain a good general knowledge of other branches, and stated in the words of Francis Bacon—

"I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and ornament thereunto."

CITY CHAMBERS, EDINBURGH.

At a recent meeting of the Edinburgh Town Council, Dean of Guild Miller brought forward a motion to consider as to utilising the ground on the west side of the Royal Exchange Square, which was scheduled under the Act of last year. The report of a sub-committee that had considered the question has been laid before the Lord Provost's committee, when the Dean explained his scheme for altering and extending the present city chambers. He pointed out that the present site had been found most suitable for the town's business, and all former council chambers had been within a stone's throw of the existing buildings, which were 140 years old, and were of such a

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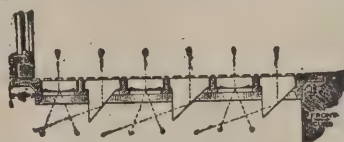


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substantial nature that they might be handed down to posterity for many years to come. They had been used by the Council for eighty-three years, and with certain additions and alterations they might be made suitable and convenient for the business of the city for several generations. Great consideration should, however, be given to the alterations to be made, so that they might do nothing that would stand in the way of a complete set of city chambers. The present front towards the Exchange Square should be allowed to remain, as well as the present stair, which was a very good one. The first change that ought to be considered was the position of the burgh court-room. That should be placed on the level of the square, so that the criminal or judicial department would be separated from the municipal departments. The burgh court-room and other rooms for the Clerk of Court and Procurator-Fiscal should be placed at the north-west corner of the square, where the Corporation now owned part of the property, and had power under the Act of last year to acquire the remaining property for necessary improvements. He suggested that in the near future they should look forward to having a larger council chamber. That could be conveniently placed over the new burgh court, and the officials' rooms on the same level as the present council chamber. The new council chamber which he proposed would be large enough for future requirements, even though Leith, Portobello, Granton and Duddingston were added to the city of Edinburgh. It would also be suitable for the licensing courts and other meetings of the justices of the peace, &c., instead of those meetings being held as at present in another building. The present council chamber, he suggested, should be used as the Lord Provost's room, excepting the space at present reserved for the public, which would form an ante-room. The present burgh court would be divided—one part forming an ante-room to the council chamber, the other forming the council officer's room. Should these changes be carried out, sufficient accommodation would be found for the city chamberlain and others who were urgently demanding larger and better premises. Mr. Morham had made sketches for future requirements, both at the north-west corner to Cockburn Street and to Craig's Close in the east, but he (the Dean) only proposed that one section should be taken up at a time, and that in the meantime they should confine themselves to the extensions which he proposed in the old Heriot buildings. The proposal of the Dean was recommitted to the sub-committee to bring up more detailed plans of the first block, with outline plans of the proposed future additions.

RUBBISH AND ELECTRIC-LIGHT.

ENORMOUS power, says the *Leeds Mercury*, lurks in the common dust-heap. Generally speaking, no use whatever is made of it at the present time. On the contrary, municipalities spend large sums of money in ridding themselves of this material, which is looked upon as a tiresome and useless encumbrance. That it must be destroyed no one will deny, and that cremation is the best means of accomplishing its destruction is equally certain. Millions of tons are dealt with after this manner annually. The process involves an appalling waste of energy. Is it possible to arrest the loss of power? This, surely, is a question of great importance to municipalities, and any serious attempt to solve the problem is worthy of consideration. The British Steam Generator and Refuse Utilisation Company, Limited, claim that they have in the Livet system of generating steam by the destruction and combustion of town refuse a means whereby corporations and other local authorities may turn to profitable account the rubbish which day by day comes into their possession.

An experimental station has been established by the company at King Cross, Halifax, and there the satisfactory utilisation of ordinary town refuse may be seen in actual operation. The material goes into the furnace just as it is delivered by the contractor to the Corporation. It undergoes no sorting whatever, and it is cremated without the production of smoke or smell. The chief feature of the Livet furnace is that the flues are so formed that the decreasing volume of gases of combustion travelling towards the chimney are made to give the air passing through the furnace bars a high velocity, producing rapid combustion and intense heat; whilst the gases themselves move so slowly through the flues that they part with all their useful heat before escaping into the atmosphere. The area over the bridge of the surface is very slightly larger than the area of the total air-space of the firegrate. Air is brought in close contact with every part of the combustible matter, and complete combustion, it is claimed, takes place. After the bridge is passed the flues begin to expand, and then the expansion continues to the chimney, so that the gases are gradually cooled, and brought into a state of tension, or partial vacuum. This accounts for the increase of draught through the fire-bars, and it also retains the gases round the boiler until full use has been made of the economical heat contained in the products of combustion. The temperature of the gases just before entering the chimney is stated to be from 300 to 400



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degrees Fahrenheit lower than that usually prevailing at this point. Another important advantage is also derived from this special construction of flue. In the ordinary refuse destructor a difficulty is experienced owing to the way in which the flues become choked with dust, but in the Livet furnaces there are chambers in which the gases are for a time in a state of rest. The particles of dust then settle to the bottom, and are collected in boxes, which can readily be removed. At Halifax the furnaces have now been working three months, and it is said that practically no dust has been found in the flues. With regard to the heating surface of the Livet boiler, it is 50 to 1 as compared with the grate surface, whereas ordinarily the ratio is not more than 30 to 1.

So much for the apparatus. What are the results achieved? Tests have been made from time to time in the presence of independent engineers. With Halifax rubbish the consumption of 1 lb. has evaporated 4·08 lbs. of water. A pound of rubbish from Bradford evaporated 3·65 lbs. of water, from Harrogate 3·39 lbs., and from Huddersfield 3·59 lbs. Up to a certain point it has been found possible to rely on rubbish alone. At the Kensington Court Electrical Station, London, where there are two Livet boilers similar to those at Halifax, 300 horse-power can be obtained with town refuse. When greater power is needed, coal is mixed with the rubbish, and the proportion of coal to refuse gradually increased until 790 horse-power is reached, when, if further energy is needed, coal alone is used. The two Livet boilers at Kensington, during one day of twenty-four hours, evaporated 124,700 lbs. of water, consumed half a ton of coal and 17 tons of rubbish, giving an average horse-power per hour of 259·8, the highest being 795 and the lowest 40. This plan of using coal when the period of heavy load comes round is, it is maintained by the proprietors of the Livet system, greatly superior to the method of having such a number of boilers under steam as shall be equal to the provision of the maximum power when it is demanded, involving heavy loss by banking fires, radiation of heat, and fixed charges. It is estimated that the cost of producing one horse-power per annum with coal is 9*l.* 2*s.* 2*d.*, with rubbish alone 3*l.* 3*s.* 2*d.*, and with rubbish assisted by coal 2*l.* 14*s.* 9*d.* By way of explanation of these somewhat curious and startling figures, it is where the average "load" does not exceed three-tenths of the total load that power can be produced by "assisting" rubbish with coal at a less cost than if refuse alone were burnt, because a less amount is sunk in the boilers and a smaller proportion of men have to be employed. To those

who would be unable to consume town rubbish it may be of interest to know that tests are said to have proved that as a steam generator, where coal alone is used as fuel, a saving of 30 per cent. is effected by the use of the Livet furnace.

To what end is this power, when produced, to be used? The company who own the Livet system of utilising rubbish say that the natural way will be to light the locality by electricity. And they practise what they preach. At Halifax they have an electric light installation connected with the boilers at King Cross, and they claim that they can there produce 250,000 candle-power by burning the town's refuse, without mixing it with coal or preparing it in any way. There are several arc and incandescent lights burning at the works, and on the roof of an adjoining mill there is a 25,000 candle-power search-light, which astonishes the neighbourhood each night. Thus they demonstrate that towns can be illuminated by electric light at a cost, so far as motive power is concerned, of less than nothing, taking into account the expenditure now involved in the destruction of refuse. The average quantity of rubbish produced in a town of 300,000 inhabitants is supposed to be about 150 tons a day in winter and 116 tons in summer, a quantity believed to be more than sufficient to light the district with electricity. To consume the whole energy produced by 150 tons of rubbish per day would require twenty-four boilers, including one standby, whilst the average demand would be equal to the constant power of ten boilers. In summer the number of boilers required to consume 116 tons of refuse would be seven.

How would this system be applicable to Leeds? Not at present in the production of electric light, for that duty devolves on a private company. It may, however, be worth the while of the city authorities to determine whether it could be profitably used in generating electricity for the tramways, should electric haulage be ultimately decided upon. It is contended that by using the Livet destructors the cost per electric car mile is reduced from 3·90*d.* to 1·68*d.*

BUILDING SITES IN NEW YORK.

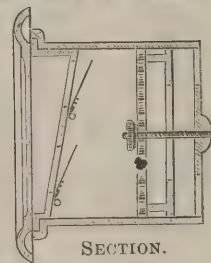
ONE of those extraordinary instances of carelessness which occur from time to time in New York in relation to building operations, says the *American Architect*, forms the theme of various articles in the daily papers. It seems that a certain Mrs. Shanks undertook to build a house on land belonging to

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her in Harlem. The house was built, but, after it was all done, it turned out to have been built, not on Mrs. Shanks's lot, but on the adjoining one, which belonged to a Mrs. Williams. Mrs. Williams's astonishment on finding that her land had been enriched at some one else's expense with a four-storey house, was hardly less than that of Mrs. Shanks at finding that she had bestowed her money on her neighbour; while three lawyers, who held as many mortgages for money advanced to build the house, were by no means agreeably surprised to find that they had advanced 9,500 dollars on a piece of real estate which still remained vacant, and which would not sell for more than 4,000 dollars. However, troubles of that kind are soon righted among honest people. Mrs. Williams told Mrs. Shanks that she would take no advantage of the mistake, but would sell her the lot on which the house stood at its value as vacant land; and in her turn, Mrs. Shanks informed her mortgagees that when the lot was transferred to her she would transfer the mortgages from the unimproved to the improved property. This programme was carried out, and all parties are now, we hope, enjoying the contentment which only a clear conscience can give. It is singular that mistakes of this kind should be so common in New York, where the rectangular and uniform disposition of the streets makes it particularly easy to stake out lots correctly; but this is the third or fourth instance within a few years of a house having been built entirely on the wrong lot of land. So far as we know, a friendly and honourable arrangement has been made in each case; but, if some avaricious owner should try to retain the property thus wrongly bestowed upon him, it might turn out that the responsibility of the surveyor who staked out the lot would be unpleasantly called in question.

THE QUERETARO AQUEDUCT.

ONE of the oldest aqueducts in Mexico was built a century and a half ago to supply the city of Queretaro. The aqueduct, which bridges water five miles, has seventy-four impressive arches, through one of the highest of which the tracks of the Mexican Central Railroad pass. The Mexican aqueducts were not arranged to deliver water under any considerable pressure; they either supplied a series of gutters passing through the town or discharged the water under light pressure at fountains, whence it was carried in vessels on the heads or backs of women, on the backs of burros, or on wheelbarrows or carts especially arranged for the purpose. There seems to be a con-

siderable opening in the near future for hydraulic engineering in the Republic of Mexico. Very few of the more important towns have water brought and distributed under pressure, and as advancements are made the number of those which provide for a water-supply will probably increase. The city of Mexico has lately contracted for additional water-supply, and an English contractor is now completing a gravity system under high pressure for the city of Pachuca.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 1860. George Harry Kirk, for "An automatic sash-fastener."
- 1869. George Oulton, for "Improvements in or connected with taps for baths, lavatory basins, and other similar purposes."
- 1874. William Charles Dudley Smith, for "Improvements in connection with locks or drop-latches for doors and such like purposes."
- 1882. William Colin Morison, for "Improvements in and connected with chimney and ventilating shaft-tops."
- 1944. Samuel Hambly, for "New or improved method of hanging window-sashes and appliances for use in connection therewith."
- 1960. Henry Smith, for "Improvements in and relating to valves."
- 1968. Charles William Alexander Taylor, for "Improvements in water gauges."
- 2002. Edward G. Brewer, for "Improvements in or connected with smoke-consuming furnaces and other grates."
- 2021. Fred. George Kely Caston, for "Improvements in buffers for railway and other vehicles."
- 2238. George Franklin Jennings, for "Improvements in hoisting apparatus."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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THE Architect and Contract Reporter.

TENDERS, ETC.

As great disappointment is frequently expressed at the non appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

MACHYNLLETH.—Feb. 28.—For Scheme of Water Supply and Sewerage. Premium of 40l. is offered. If the Engineer whose scheme is selected is appointed to superintend the execution of works, the premium merges into his commission. Mr. David Humphreys, Inspector of Nuisances, Machynlleth.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk

CONTRACTS OPEN.

ABERAMAN.—March 1.—For Building Police Station. Mr. T. Mansel Franklen, Clerk of the Peace, Glamorgan County Offices, Westgate Street, Cardiff.

ABERDEEN.—March 1.—For Construction of Fireclay Pipe Sewers, Cast-iron Pipe Sea Outfalls, &c, Gardenstown. Messrs. Jenkins & Marr, Engineers, 16 Bridge Street, Aberdeen.

ABERKENFIG.—March 3.—For Building Police Station. Mr. T. Mansel Franklen, Clerk of the Peace, Cardiff.

ANERLEY.—March 2.—For External Painting of District School. Mr. A. G. Hennell, Oakwood, Mayow Road, Forest Hill.

ANTRIM.—March 5.—For Building Lunatic Asylum at Holywell. Mr. J. Lanyon, Architect, Northern Bank Chambers, Royal Avenue, Belfast.

BARNLEY.—Feb. 26.—For Building Residence, Stabling, &c. Mr. R. Dixon, Architect, 5 Eastgate, Barnsley.

BARNLEY.—Feb. 26.—For Building Six Houses. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BATH.—Feb. 24.—For Execution of Work, Supply of Materials, &c., for One Year. Mr. C. R. Fortune, City Surveyor, 3 Terrace Walk, Bath.

BELFAST.—Feb. 23.—For Building Lecture Hall to Carnmoney Presbyterian Church. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BILLINGSGATE.—Feb. 27.—For Construction of Underground Conveniences. The Engineer to the Commissioners of Sewers, Guildhall, E.C.

BISHOP'S STORTFORD.—March 5.—For Supplying Steam Cooking and Heating Apparatus at the Workhouse. Mr. Henry Baker, Clerk to the Guardians, Bishop's Stortford.

BLOXWICH.—March 12.—For Building Infants' School. Messrs. Bailey & M'Connell, Architects, Bridge Street, Walsall.

BODMIN.—Feb. 24.—For Building Board Schools. Mr. W. J. Jenkins, Architect, Bodmin.

BOTLEY.—Feb. 26.—For Building Seven Houses. Mr. John H. Brearley, Architect, Commercial Street, Botley.

BRIGHTLINGSEA.—March 5.—For Improvements and Re-benching Chapel. Mr. Charles Pertwee, Architect, Bank Chambers, Chelmsford.

BRIGHTON.—March 8.—For Construction of Swimming-bath, North Road. Mr. Francis C. J. May, Borough Engineer, Town Hall, Brighton.

BUCKHURST HILL.—March 3.—For Tar-paving the Playgrounds and Footpaths at Boys' Board School. Mr. E. Egan, Architect, Chigwell.

BUCKHURST HILL.—March 3.—For Enlargement of the Boys' Board School. Mr. E. Egan, Architect, Chigwell.

BURNLEY.—Feb. 28.—For Building Sulphate Works at Gasworks. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

BURNLEY.—For Additions to Paper Works. Mr. John Bradley, 14 Market Street, Bury.

CARDIFF.—Feb. 23.—For Building House. Mr. E. W. M. Corbett, Architect, Castle Street, Cardiff.

CARDIFF.—Feb. 28.—For Construction of Sewers, Flushing Tanks, &c, Whitchurch. Mr. W. Fraser, Engineer, 275 Cowbridge Street, Cardiff.

CARLISLE.—Feb. 28.—For Restoration (after fire) of Crown Inn. Messrs. Beaty Bros., Devonshire Street, Carlisle.

CHELMSFORD.—Feb. 28.—For Building Gymnasium at King Edward's Grammar School. Mr. Charles Pertwee, Architect, Bank Chambers, Chelmsford.

CLOWN.—March 1.—For Additions to Board Schools. Messrs. Rollinson & Son, Architects, 13 Corporation Street, Chesterfield.

CO. SUTHERLAND.—March 5.—For Construction of Three Harbours. Mr. James Barron, Engineer, 7 Union Terrace, Aberdeen.

CRANBROOK.—Feb. 28.—For Supply of Road Material. Mr. T. H. Crampton, Cranbrook, Kent.

CROMER.—Feb. 26.—For Construction of Pipe Sewers. Mr. A. F. Scott, Surveyor, Local Board Offices, Cromer.

DARWEN.—Feb. 28.—For Alterations to County Police Station. Messrs. Varley & Sandbach, Architects, 15 Richmond Terrace, Blackburn.

DENABY MAIN.—For Building Hotel.—The Messenger Colliery Offices, Denaby Main, Yorks.

DISTINGTON.—March 1.—For Building Shop, Warehouse and Dwelling-house for Messrs. Fox Bros., Distington, and 8 Fisher Street, Workington.

DUBLIN.—Feb. 27.—For Building Artisans' Dwellings. Mr. Spencer Harty, Borough Surveyor, 82 Dame Street, Dublin.

EASTBOURNE.—March 1.—For Boundary Walls for Enlargement of Cemetery. Mr. H. Euean Rumble, Architect, 27 Hyde Gardens, Eastbourne.

EBBW VALE.—March 1.—For Building Public Hall, Shops, Offices, &c. Mr. E. A. Johnson, Architect, Abergavenny.

FAILSWORTH.—Feb. 28.—For Construction of Two Main Outfall Sewers, Pipe Sewers, &c. Messrs. Lomax & Lomax, Engineers, 29 Grosvenor Chambers, Deansgate, Manchester.

FAREHAM.—Feb. 26.—For Building Block for Fifty Children at County Lunatic Asylum. Mr. B. S. Jacobs, Architect, Lincoln's Inn Buildings, Hull, and 88 Bishopsgate Street, E.C.

FLEET, HANTS.—For Building Residence. Messrs. Ludford & Tulloch, Architects, 39 Victoria Street, S.W.

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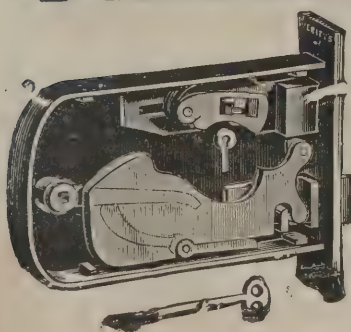
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GATESHEAD.—Feb. 28.—For Building Board Schools, Brighton Avenue. Messrs. Oliver & Leeson, Architects, Bank Chambers, Newcastle-on-Tyne.

GLASGOW.—March 1.—For Embanking North Side of the River Clyde (230 Yards). Mr. A. B. McDonald, City Engineer, 64 Cochrane Street, Glasgow.

GLASGOW.—March 5.—For Works in Construction of Gate Lodges, Waiting-rooms, &c., at Botanic Gardens. Mr. A. B. McDonald, City Engineer, 64 Cochrane Street, Glasgow.

HALIFAX.—March 5.—For Taking-down Old Buildings and Erection of Schools. Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

HANLEY.—Feb. 26.—For Building Shop and Residence. Mr. Ambrose Wood, Architect, Regent House, Hanley.

HARWICH.—March 6.—For Building Board Schools, Boundary Walls, &c., Upper Dovercourt. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

HEMSWORTH.—March 6.—For Supplying and Laying Pipe Sewers. Mr. Richardson, Surveyor, Imperial Buildings, Bond Street, Leeds.

HIGHAM.—Feb. 26.—For Construction of Engine and Boiler House and Reservoir, Higham, Rochester. Messrs. Easton & Co., Engineers, 11 Delahay Street, Westminster.

HORNSEY.—Feb. 23.—For Execution of Sewerage and Drainage Work, Street Watering and General Cartage Work, Concrete Footway Pavements, and the Supply of Stoneware Pipes and other Stoneware Goods, Broken Granite and other Road Materials, Broken Stone for Macadamising, Paving Granite and General Masons' Materials, Portland Cement, Grey Stone Lime, for One, Two, or Three Years. Mr. F. D. Askey, Clerk to Local Board, Southwood Lane, Highgate, N.

HYDE.—Feb. 26.—For Building Cemetery Chapels. Messrs. J. W. & R. F. Beaumont, Architects, 10 St. James Square Manchester.

KING'S NORTON.—Feb. 26.—For Erection of Two Chapels, Two Lodges and Front Boundary Wall for projected Cemetery. Mr. F. B. Andrews, Architect, A.R.I.B.A., 102 Colmore Row, Birmingham.

LEEDS.—Feb. 26.—For Building Board School for Infants, Castleton. Mr. W. Packer, Clerk to the School Board, Leeds.

LEYTON.—March 13.—For Building Public Offices and Technical Institute. Mr. John Johnson, Architect, 9 Queen Victoria Street, E.C.

LINDSAY.—Feb. 28.—For Erection of a Court-house and other Police Buildings, Roads, &c. Mr. James Thropp, 29 Broadgate, Lincoln.

LIVESFY.—Feb. 26.—For Building Vicarage. Messrs. Stones & Gradwell, Architects, 10 Richmond Terrace, Blackburn.

LLANELLY.—March 10.—For Building Town Hall and Public Offices. Mr. Wm. Griffiths, Architect, Falcon Bridge, Llanelly.

LIANHILLETH.—March 1.—For Building Board Schools. Messrs. Alfred Swash & J. Bain, Architects, 3 Friars' Chambers, Newport, Mon.

LLANISHEEN.—For Building Infants' Wing to Schools, and Addition to Master's House. Messrs. Kempson & Fowler, Architects, 16 High Street, Cardiff.

LLWYDCOED.—Feb. 27.—For Building Cottage at Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

MALDON.—March 1.—For Rebuilding Stables at the Blue Boar. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

MANCHESTER.—Feb. 23.—For Building Fruit Auction Sale-room, Shops, Offices, &c. Mr. John Allison, City Surveyor, Town Hall, Manchester.

MARKET DRAYTON.—Feb. 27.—For Erection of Goods Shed with Offices at Great Western Railway Station. Mr. G. K. Mills, Secretary, Paddington Station.

MARYPORT.—Feb. 26.—For Reconstruction of Warehouse. Messrs. Johnstone Bros., Architects, 39 Lowther Street, Carlisle.

MYNYDDISLWYN.—Feb. 26.—For Additions to Board Schools. Mr. George Rosser, Architect, Albion Chambers, Newport, Mon.

NELSON.—Feb. 25.—For Building Cemetery Chapels. Mr. H. Whitaker, Architect, 26 Every Street, Nelson.

NELSON.—March 15.—For Building Sludge Press-House, Cake Stores, with Sludge Reservoir, &c. Mr. J. W. Bradley, Borough Engineer.

NEWCASTLE.—March 3.—For Supply of Building Materials for War Department Buildings and Property, for a Period of Three Years. Lieut.-Colonel G. Hildebrand, R.E., Newcastle.

NEWINGTON.—Feb. 26.—For Supply of Road Material for One Year from March 25. Mr. L. J. Dunham, Vestry Hall, Walworth, S.E.

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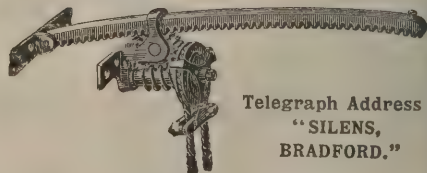


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PONTYPRIDD.—March 8.—For Building Seven Houses. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

PRAZE.—Feb. 24.—For Building Mixed School. Messrs. Carah & Son, Architects, Praze, Camborne.

PRESTON.—Feb. 27.—For Building Methodist Chapel. Mr. W. H. Dinsley, 20 High Street, Chorley.

PUDSEY.—March 5.—For Building Twenty-six Through Houses. Mr. H. Hodgson, Architect, 27 Kirkgate, Bradford.

RHYL.—March 1.—For Building a Ward Block, with Wash-house, Mortuary, &c. Mr. James Hughes, Architect, Denbigh.

ROCHFORD.—Feb. 26.—For Sinking and Construction of a Well and Bore-hole at South Queensbury. Mr. James Mansergh, 5 Victoria Street, S.W.

RUSHDEN.—For Building House, Shop, &c. Mr. H. Adwitt, Architect, Harboro Road, Rushden.

SALTBURN-BY-THE-SEA.—Feb. 28.—For Laying about 600 Lineal Yards of Cast-iron Pipes, and the Construction of a Flushing Chamber, Manholes, and about 130 Yards of Glazed Sanitary Pipes. Mr. G. S. Hikeley, C.E., Saltburn.

SCUNTHORPE.—Feb. 28.—For Building Court-house and Police Buildings. Mr. James Thropp, Architect, 29 Broadgate, Lincoln.

SHEFFIELD.—Feb. 28.—For Extension of Schools, Spink-hill. Mr. E. Winder, Architect, Wharf Street, Sheffield.

SHREWSBURY.—For Restoration of St. Mary's Church. The Vicar.

SILLOTH.—For Building Infants' School. Mr. G. Armstrong, Architect, 45 Lowther Street, Carlisle.

SKIPTON.—March 2.—For Supplying and Laying Pipe Sewer, &c. Messrs. Barber, Hopkinson & Co., Engineers, Temple Street, Keighley.

SLAITHWAITE.—Feb. 28.—For Building Board School and Master's House. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

ST. BLAZEY.—Feb. 28.—For Walling Burial Ground. Messrs. Graham & Graham, Solicitors, St. Austell.

ST. SAVIOUR'S.—Feb. 27.—For Supply for One Year from March 25 next, of York Paving and Granite Curb, in such Quantities as may from time to time be Ordered. Mr. W. H. Atkins, Emerson Street, Southwark.

SWINDON.—March 3.—For Building Two Cottages. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

TON PENTRE.—Feb. 23.—For Erection of Library Buildings. Mr. Jacob Rees, Architect, Hillside, Pentre, Rhondda.

TOTTENHAM.—Feb. 27.—For Making-up Culvert Road, Napier Terrace, Hermitage Road and Selwyn Road. Mr. P. P. Murphy, School Board Offices, High Road, Tottenham.

WALSALL.—March 1.—For Building Cottage, Reed's Wood Park. The Borough Surveyor.

WATFORD.—March 5.—For Additions to Police Station. Mr. Urban A. Smith, County Surveyor, 28 Victoria Street, Westminster.

WALTON-ON-HILL.—Feb. 28.—For Construction of Sewerage Works. Mr. S. Middlebrook, Surveyor, Town Hall, Walton.

WEST HAM.—Feb. 26.—For Building Board Schools, Upton Park. Messrs. J. T. Newman & Jacques, Architects, 2 Fen Court, E.C.

WEST HAM.—March 13.—For Erection of a Block of School Buildings and Appurtenances at Upton Park. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

WEST MALLING.—Feb. 28.—For Erection of Fire Escapes at Workhouse Infirmary. Mr. Hubert Bensted, Architect, Maidstone.

WIGTON.—March 5.—For Rebuilding Premises. Messrs. Moffat & Bentley, Architects, Whitehaven.

WOMBWELL.—Feb. 26.—For Building Three Shops, Houses, &c. Mr. John Robinson, Wombwell.

WOOD GREEN.—Feb. 23.—For Tar-paving Works. Mr. J. W. Britton, Town Hall, Wood Green.

THE *Glasgow Herald* says:—Sir Charles Hartley, engineer, now engaged on the Danube Commission, will go out at the end of the year to advise the Chinese Government as to the best method of deepening the entrances of the Yangtze. The Chinese local authorities employed a dredger for two years on it, but with no appreciable effect. The visit of Sir Charles Hartley will, it is thought, cost 3,000*l*.

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J. Day	140	0	0
E. TOY (accepted)	134	15	0

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For Building Board Schools, Wharton Road, Bromley, Kent, to Accommodate 1,066 Children, for the Bromley School Board. Mr. CHARLES BELL, F.R.I.B.A., Architect, 3 Salters' Hall Court, Cannon Street, E.C. Quantities by Messrs. C. STANGER & SON, 21 Finsbury Pavement, E.C.

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R. A. Lowe	10,552	0	0
T. Crossley & Son	10,414	0	0
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For Restoration of Caerwys Church. Mr. W. H. SPAULL, Architect, Oswestry.

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W. Griffiths, Knockin	1,786	0	0
J. Edwards, Caerwys (withdrawn)	1,136	0	0

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A. Cormack, Stonehaven, plasterer	38	10	0
J. Burness, Stonehaven, plumber	13	10	0

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For Building Two Chapels and Superintendent's House, at Cemetery, Brook Street, Erith, for the Local Board.

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F. Hind, Belvedere	996	0	0
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Woolwich and District Co-operative Builders	751	0	0

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Woolwich and District Co-operative Builders	569	0	0
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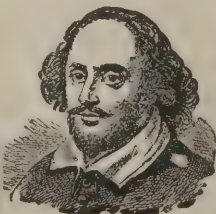
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W. Jenkins & Son	430 0 0
W. G. Cannon	416 10 0

LONDON—continued.

For Erecting Centre on Hither Green Site, Lewisham, for Use alternately for Cookery and Laundry Purposes; for Providing a New Door into the Schoolkeeper's Yard and a New Coal Store, and also for Re-erecting Division Walls between the Playgrounds of Each Department, for the School Board.

W. V. Goad	£1,262 0 0	£26 0 0
McCormick & Sons	1,102 0 0	15 0 0
E. Proctor	1,057 16 1	12 6 6
J. Willmott & Sons	1,056 0 0	22 0 0
J. Smith & Sons	1,042 0 0	20 0 0
W. Akers & Co.	990 0 0	39 0 0

A. Extra if Brickwork in Cement.

For Painting, Decorations and Interior Woodwork at No. 31 Marlborough Place, St. John's Wood. Mr. W. BANKS, Architect.

S. J. WARING & SONS (accepted) £560 0 0

For Paving Works, &c., Munster Road, for the Fulham Vestry. Mr. J. P. NORRINGTON, Surveyor.

York Stone.

Tildesley & Co.	£248 15 6
Wimpey & Co.	211 0 0
Nowell & Robson	194 0 0
T. Adams	180 11 0

Indurated Stone.

T. Adams	157 1 6
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Stuart's Granolithic.

T. Adams	157 1 6
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Imperial.

Imperial Stone Company	178 0 0
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T. Adams	161 0 0
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For Construction of River Wall and Foundations for Mill and Granary, Chelsea Wharf, Lot's Road, for the London General Omnibus Company, Limited. Mr. PERCY W. BRITTON, Engineering and Building Department.

Perry & Co.	£7,110 0 0
Mowlem & Co.	5,616 0 0
G. Parker	5,600 0 0
Docwra & Son	5,304 0 0
S. Chafen	4,294 12 4
Colwell & Hazle*	4,179 2 0

* Accepted subject to modification.

"SPHINX" PORTLAND CEMENT.



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1½ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

Specially adapted for Concrete Floors & Street Paving. "ECLIPSE" PORTLAND CEMENT. Quick setting; test, 3 parts. Standard Testing Sand, 230 lbs. per square inch; 28 days. The finest, most plastic, best sand-carrying and cheapest Cement in the market.

Specially adapted for laying encaustic tiles, making joints in sanitary pipes, internal stucco, concrete foundations, &c. Samples sufficient for Practical Tests Free. Manufactured by JOHN BOARD & CO., Dunball, Bridgwater.

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Unrivalled for Quality, Colour and Durability.

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International Exhibition,

London, 1882.

"Model Dwelling," New-

castle Exhibition, 1887.

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DEEP OLIVE GREEN.

DARK GREEN.

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BUTTERMERE GREEN SLATE CO.

LIMITED,

KESWICK, CUMBERLAND.

ELECTRIC LIGHT

Over 20 Years'

Experience.

GOLD MEDAL,

LONDON, 1882.

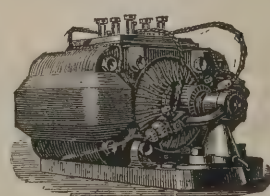
SILVER MEDAL,

PARIS, 1881.

ESTIMATES FREE.

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LONDON—continued.

For Factory and Stabling, &c., Whitechapel, for Messrs Kearley & Tonge. Messrs. WM. EVE & SON, Architects 10 Union Court, Old Broad Street, E.C.

Braid & Co.	£7,200	0	0
Godfrey & Son	6,987	0	0
Shurmer	6,900	0	0
F. & H. F. Higgs	6,899	0	0
Patman & Fotheringham	6,851	0	0
Chessum & Son	6,839	0	0
HARRIS & WARDROP, Wallwood Street, E.			
(accepted)	6,683	0	0
Kilby & Gayford	6,654	0	0

For Extension of Stabling at York Mews, City Road, for Messrs. Martin & Allen. Messrs. WM. EVE & SON, Architects, 10 Union Court, E.C.

Godfrey & Son	£926	0	0
Salt	919	0	0
Harris & Wardrop	898	0	0
F. & H. F. Higgs	892	0	0
Eaton & Co.	863	0	0
J. H. JOHNSON, Commercial Road, E. (accepted)	799	0	0

For Alterations and Additions to 104-5-6 Leadenhall Street. Messrs. WM. EVE & SON, Architects, 10 Union Court, Old Broad Street, E.C.

F. & H. F. Higgs	£1,894	0	0
Lascelles	1,853	0	0
Godfrey & Son	1,754	0	0
Harris & Wardrop	1,710	0	0
JOHNSON, Commercial Road, E. (accepted)	1,497	0	0

PORT TALBOT.

For Building Hotel, Coachhouse, Stables, &c., Port Talbot, for Mr. John Vaughan. Messrs. LAMBERT & REES, Architects, Bridgend. Quantities by Architects.

E. Fryall, Richards & Co., Cardiff	£4,220	14	6
T. Evans, Cardiff	4,100	0	0
Hatherly & Carr, Bristol	3,647	0	0
W. Thomas, Port Talbot	3,600	0	0
M. Cox, Port Talbot	3,530	0	0
J. & S. Rees, Port Talbot	3,494	11	0
T. Roberts, Pontycymmer	3,415	0	0
E. C. Newby & Co., Cardiff	3,375	0	0
H. Evans, Cardiff	3,300	0	0
D. C. JONES & Co., Gloucester (accepted)	3,265	0	0

MANGOTSFIELD.

For Construction of Main Outfall and Branch Sewers, Precipitation-tanks and Filter-beds, Erection of Sludge-pressing Buildings, Chemical Stores and Sludge-pressing Plant and Mixing Machinery, at Mangotsfield and Staple Hill, for the Keynsham Rural Sanitary Authority. Mr. NICHOLSON LAILEY, Engineer, 16 Great George Street, Westminster, S.W.

J. H. Firbank, Newport	£28,500	0	
Thomson & Co., Avonmouth	25,929	0	0
Adams, London	25,893	0	0
Jones & Fitzmaurice, Birmingham	24,500	0	0
J. Mackay, Newport	24,494	0	0
Cooke & Co., London	24,229	0	0
Lloyd & Powell, Bristol	23,733	17	6
Love & Wait, Bristol	23,650	0	0
J. Linton, Newport	22,400	0	0
Tree & Sons, Bristol	22,006	0	0
G. Osenton, London	21,969	0	0
H. Hill, Maidenhead	20,124	0	0
J. Neave, London	19,374	0	0
A. KRAUSS, Bristol (accepted)	19,487	0	0

PLYMOUTH.

For Alterations and Additions to 21 and 22 Old Town Street, for Messrs. Stidston & Co. Mr. H. J. SNELL, Architect. A. R. LETHERIDGE & SON (accepted) £877 0 0

REDRUTH.

For Building Two Villas, Esplanade, Fowey, for Mr. W. Gundy. Mr. SAMPSON HILL, Architect, Redruth.

Second Block.

N. PENTER, Pobruan (accepted)	£1,250	0	0
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Third Block of Two Villas.

N. PENTER, Pobruan (accepted)	£1,450	0	0
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For Enlargement of Schools at St. Stephen's, for St. Stephen's-in-Bramwell School Board. Mr. SAMPSON HILL, Architect, Redruth.

GILBERT & WALTERS, St. Stephen's (accepted)	£195	0	0
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For Erection and Completion of Cornish Bank and Premises at St. Blazey, for the Cornish Bank, Limited. Mr. SAMPSON HILL, Architect, Redruth.

F. J. MABLEY, Par Station, R.S.O. (accepted)	£670	0	0
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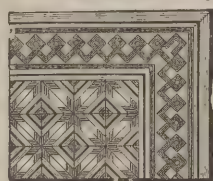
Output 700 tons weekly.

Telephone No. 16.

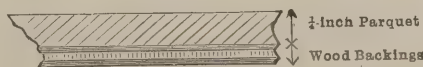
Telegraphic Address, "Adamant, Hull."

PARQUET FLOORINGS,

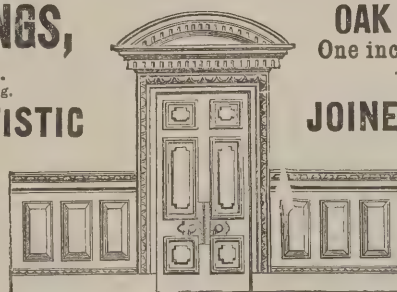
One inch and 1/4-inch thick.
Immense Stock always ready for Laying.



Turpin's Patent.
5/16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)



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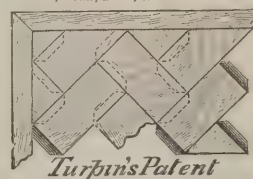


WOOD CARVING.

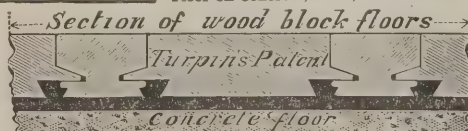
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OAK BLOCK FLOORINGS

One inch thick, 4s. 10d. per yard, super.
Also in Pitch Pine, Teak, Deal, &c.



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System of Preparing for Laying inch Block Floor on Concrete, Stone, and Deal Floors.



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RYE.

For Building School and Other Rooms, for the Committee of the Rye Congregational Church.

F. L. Pattenden, Ore, Hastings	£960	0	0
A. Comport, Northiam	783	0	0
H. Knock, Ashford, Kent	750	0	0
G. Huggett, Rye	740	0	0
A. G. Nunn, Tenterden	698	0	0

SALISBURY.

For Building Sanatorium on Premises of the Godolphin High School for Ladies, Milford Hill, Salisbury. Messrs. JOHN HARDING & SON, Architects, Salisbury. Quantities by Architects.

E. Witt, Salisbury	£713	11	10
F. Dibben, Salisbury	674	0	0
C. A. Hayes, Bristol	661	0	0
G. Harris, Salisbury	653	0	0
H. J. Kite, Salisbury	652	0	0
Kellow & Smith, Salisbury	619	7	8
E. Hale, Salisbury	605	0	0
WEBB & CO., Salisbury (accepted)	595	0	0

ST. ALBANS.

For Building Residence, for Mr. Dunning. Mr. F. W. KINNEIR TARTE, Architect.

J. T. Bushell	£895	0	0
Boff Bros.	877	0	0
J. & W. Savage	874	0	0
Wibley & Jervis	775	0	0

WALTHAMSTOW.

For Erection of Six Residential Flats, Station Road, Walthamstow. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

Hearle & Farrow	£1,350	0	0
J. & H. Cocks	1,273	0	0
C. North	1,190	0	0
Cousell Bros.	1,143	0	0
W. ATKINS (accepted)	1,050	0	0

AN inquiry has been held by the Local Government Board at Brownhill in respect of carrying out sewage disposal works at Walsall Wood. It is proposed to borrow 10,000*l.* to carry out the scheme.

ELECTRICAL.

At the meeting of the Improvement Committee of the Sheffield City Council the question of the method of lighting the new Town Hall was considered, and the following resolution was passed:—"That provision be made for a supply of electricity throughout the new Town Hall, and for a modified supply of gas to light the corridors and staircases; that the architect be requested to report to what extent this modification of gas supply will reduce the contract; and also to report whether, in his opinion, it would be desirable to dispense with gas altogether, and in that case what further reduction would be effected."

At the meeting of the Birmingham City Council a scheme for lighting the Market Hall by electricity was adopted, and the Finance Committee instructed to borrow 1,000*l.* for providing the necessary lamps, fittings, &c. Some time past the lighting of the market had been very unsatisfactory. Electricity will prove cheaper than gas. The first reason for this was because of the wasteful character of the gas-lighting of the Market Hall, and the second because of special terms from the electrical company.

ELECTRIC light has been installed in the church of St. Mary-at-Hill, Eastcheap, which for some two years has been closed for works of repair.

TRADE NOTES.

At Driffeld Mr. Prince Smith, J.P., has erected a water tower at his residence, Southburn Street, and amongst many other improvements has placed a beautiful illuminated clock and bell on the side facing the highway, for the benefit of the public at large. The necessary work has been executed, from instructions received from Mr. James Ledingham, architect, Bradford, by Messrs. Wm. Potts & Sons, clock manufacturers, Leeds, who have also just erected a new clock for Mr. H. Andrews, J.P., Swarland Hall, Felton, and one for the new portion of the N.E.R. station, Newcastle.

THE Handsworth School Board have accepted the tender of Mr. J. Webb, of Villa Road, for the erection of Board schools in Wattville Street at a cost of 12,434*l.*

THE engineering work in connection with the swimming and private baths at the St. Bride's Institute is being carried out on the "Roshier System" by the Rainbow Engineering

Importers of Sicilian
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Slabs, Curbs, and
Coloured Marbles,
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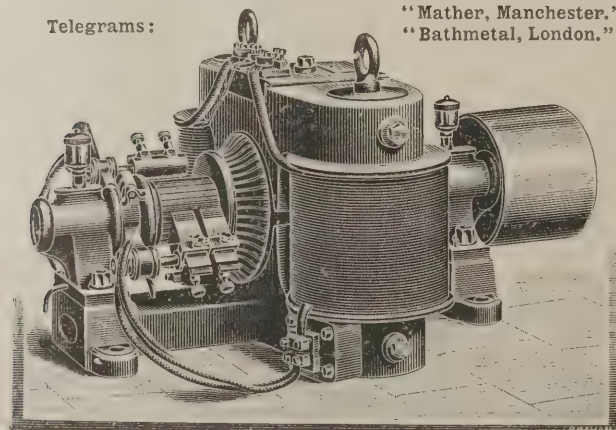
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PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866, November 1867, and May 1870. *The Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10s. and upwards.

Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Baginbun Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s.

Water-testing Apparatus for detecting impurities in Water, 10s. 6d. and 12s. each.

157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



Company, Limited, of 39 Victoria Street, S.W., who are also doing the air-heating of the building. The "Roshier System" is also being employed at the new public baths just opened at Ipswich, the work being carried out by Mr. Henry Prince, of 3 Victoria Street, London, S.W.

AMONG other valuable health-promoting appliances of the present day, what is styled the "Silent Mica Flap Smoke-proof Chimney Breast Ventilator," new patent by Messrs. Comyn Ching & Co., is well suited to meet the requirements of the day. It is an improvement in several respects on Messrs. Comyn Ching & Co.'s original mica flap ventilator, which has been so extensively appreciated by the public and has consequently been imitated to a discreditable extent.

THE London County Council have decided on an extension of the Wandle Branch Sewer at a cost estimated at 9,000*l.*, and the construction of a new sewer from Hammersmith Road to Walham Green, the approximate cost of which is taken at 25,700*l.*

VARIETIES.

THE Limerick Corporation have decided to borrow 10,000*l.* from the Government to erect artisans' dwellings.

At the meeting of the Edinburgh Dean of Guild Court a warrant was granted to the application of Mr. Andrew Scott, C.A., secretary, to add a new wing to the Royal Maternity Hospital, Lauriston. The new wing at the Maternity Hospital will provide on the basement flat a lecture-room; on the street floor a dispensary, receiving-room and three wards; on the first floor a staff-room, nurses' sitting-room and two wards; and on the second floor nurses' sleeping accommodation.

THE Islington Vestry have unanimously decided to oppose the portion of the London County Council's Improvement Bill for reconstructing Highgate Archway, and widening and improving Archway Road and Hornsey Lane, at an estimated cost of 28,000*l.*, objecting to the proposal that they thenceforward maintain the thoroughfare.

NEW waterworks are proposed to be carried out for Naas, the cost of which is estimated at about 4,000*l.* An inquiry has just been held by the Local Government Board.

IN setting apart space in the Royal Aquarium for a Clubmen's Lounge, Mr. Josiah Ritchie, the active managing director, has hit upon an unique and successful issue. The

ground, which is carpeted in crimson, measures 160 feet by 46 feet; the lounge is handsomely and comfortably furnished with some hundred or so of perhaps the cosiest and easiest chairs extant, technically known as saddle bags. Chess and draughts are provided, and all the morning and evening papers and periodicals are arranged on reading stands and tables throughout. All these advantages are to be had for the small sum of 2*l.* 2*s.* half-yearly or 3*l.* 3*s.* annually, representing 1*s.* 2½*d.* per week, for which small sum clubmen gain admission to the building and have the further advantage of passing to and from the orchestra stalls. The lounge overlooks the great central stage, and Mr. Ritchie prides himself that the variety performances thereon appeal to the intellect, being generally interesting and clever. Probably at no place of entertainment in the world are so many changes of varieties to be seen. In addition to the two great central stage varieties, commencing at 2.30 and 7.30, and concert at 5.30 to 6.50 (to all of which visitors for one payment are entitled to remain), there are all sorts of attractions and side shows.

A PARTNERSHIP has been arranged between Mr. Alex. McCulloch, architect, and his chief assistant, Mr. Geo. Jamieson. Mr. Jamieson received his early training in the office of Mr. Alex. Hutcheson, and was also assistant to the late Mr. James Maclaren.

BUILDING AND BUILDERS.

At the annual meeting of the Aberdeen Royal Infirmary and Lunatic Asylum Corporation, Lord Provost Stewart presiding, Mr. David Littlejohn, chairman of the Infirmary, moved the adoption of the report, which showed that there had been 243 more patients than in the previous year, and a deficit in the accounts of 1,470*l.* With regard to the new hospital buildings 46,000*l.* had been spent, and there was still 4,000*l.* or 5,000*l.* in hand, and according to the best estimate the architects had made it would be foolish to reckon that future requirements would be less than 20,000*l.* The report was adopted, power being also given to the directors to borrow 20,000*l.* for the completion of the jubilee scheme of hospital reconstruction and extension. Mr. Alexander Walker, merchant, chairman of the Lunatic Asylum Board, presented the directors' report, and moved that 3,800*l.* be offered to the Infirmary Board for the Convalescent Hospital property, adjoining the Asylum, for reconstruction purposes. Mr. Wilson, architect, seconded, and the proposal was adopted.

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L. & S.W.R., NINE ELMS, S.W.

INCORPORATING PIOTOR & SONS, RANDALL, SAUNDERS & CO., LTD., I. SUMSION, CORSHAM BATHSTONE CO., LTD.,
R. J. MARSH & CO., LTD., S. R. NOBLE, STONE BROS., LTD.

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CORSHAM DOWN.
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FLUATE
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THE BATH STONE
FIRMS, LTD.
BATH.

QUARRIES.

BOX GROUND.
COMBE DOWN.
STOKE GROUND.
WESTWOOD GROUND.
WINSLEY GROUND.



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FIRST-CLASS JOINERY

OF EVERY DESCRIPTION,

IN SOFT OR HARD WOODS,

For Bank and Office Fittings, Church Seats, Screens, Pulpits, &c.

Also Artistic and Decorative Joinery

FOR MANSIONS PRIVATE HOUSES, ETC.

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B. E. NIGHTINGALE, Builder & Contractor,

ALBERT WORKS, ALBERT EMBANKMENT, LONDON, S.E.

THE annual dinner of the Hull Master Builders' Association was held at the Grosvenor Hotel, when a large number sat down to dinner, the president, Councillor Skinner, in the chair, supported, amongst others, by the Mayor, Councillors Scott and Wharram, Messrs. J. Bilson, F. S. Brodrick, P. Gaskill, J. Watson, architects; and Messrs. Marsden, Liggins, Beevers, Levitt, Good, Panton, Houlton, Jackson, Nicholson, Drury, Goates, Darnley, Bray, Townsley, Knowles, Fillingham, Temperton, Myers, Hunter, Hodgson, Beal, Eckles, Sweeting, Simpson, Blackburn, jun., Hirst and Southern.

At the annual dinner of the Dundee Master Builders' Association, the president, ex-Bailie Scott, in the chair, after the dinner, among other toasts, were:—"The Dundee Institute of Architects," by Mr. Stocks, replied to by Mr. Mackison; "Representatives from other Cities," by Mr. Macaulay, replied to by Mr. Adams, Glasgow; "The Timber Trade," by Mr. T. S. Robertson, replied to by Mr. Bell; "The Quarry-Masters," by Mr. Thomson, replied to by Mr. Galloway; "The Legal Profession," by Bailie Macdonald, replied to by Mr. Dickie; "The Clergy," by ex-Bailie Stuart, replied to by the Rev. J. Dowie; "The Ladies," by Mr. Bennet, responded to by Mr. Clark; "The Chairman," by Mr. Sutherland, Perth; and "The Croupiers," by Councillor M'Leish, Perth.

THE annual banquet of the Plymouth, Stonehouse, Devonport and District Master Builders' Association has just been held at Plymouth. Mr. A. N. Coles, president, took the chair, and the company included Messrs. H. Kerswill, vice-chairman; W. Laphorn, hon. treasurer; and C. L. Duke, hon. secretary. Mr. Yates proposed "Success to the Association," which was acknowledged by Mr. G. H. Smith, C.C. (Devonport), who contended that the events of the past few years had justified the formation of the Society. He hoped masters would always treat good workmen well, and that in the future employer and employé would work together in unity. Mr. S. Roberts submitted "The President," and dwelt upon the necessity of their supporting one another in endeavouring to obtain fair contracts by the inclusion of an arbitration clause. He also urged them to combine in insisting upon the quantities forming part of a contract. The Chairman, in response, congratulated the Association upon having satisfactorily settled disputes with their employés. He hoped the architects of Plymouth would meet them in a fair way in regard to an arbitration clause in contracts. In most parts of the country the clause was included, and but for a few men it would be adopted in

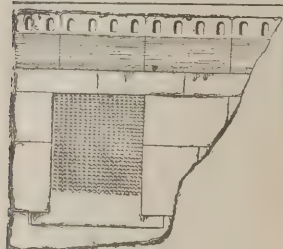
Plymouth. In another column will be found a report of the annual meeting of the Nottingham Master Builders' Association.

At the monthly meeting of the Leamington School Board the building committee recommended that the arches on which the Leicester Street schools are built should be converted into a school for manual training and cookery classes. Plans were submitted and passed.

THE Birmingham Town Council have decided on the purchase of a site on which to erect new market buildings.

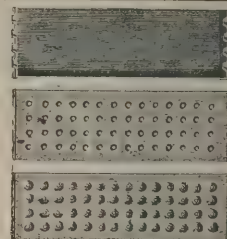
BUILDING BY-LAWS, GLASGOW.

At the meeting of the architectural section of the Philosophical Society of Glasgow, Mr. Campbell Douglas in the chair, a paper on "The Glasgow Building Regulations Act of 1892" was read by Mr. George W. Barras, writer. Mr. Barras stated that this Act is the latest of a series of Acts affecting the city in its formation, sanitation and improvement. Since 1844 sanitary matters have been receiving the attention of the city authorities, but before 1862 no Act existed for regulating properly the erection and alteration of buildings, &c. In 1862 a General Police Act was passed, and in 1866 the Glasgow Police Act was passed. The Act of 1892 has altered and extended the 1866 Act as to buildings, streets, openings, drainage, ventilation, foundations and sanitary details. It is now generally admitted that two great causes of mortality in this and other large cities are diseases of the lungs and zymotic diseases. These are largely avoided by spreading the population over as wide an area as possible. Disease existed more than to double the extent in densely than in other populated districts. The percentage of Glasgow houses of one and two apartments is about forty-five and of houses above three apartments eleven. Mr. Barras gave an outline of the provisions of the Act of 1892, calling special attention to the clauses in regard to ventilation and drainage, the height of buildings and the cubic contents of apartments. The question of the ventilation of hollow squares, he stated, had aroused much difference of opinion, but it had been proved that small hollow squares were unhealthy and to be avoided. The question of free space had been brought before the Court of Session, both under the Act of 1866 and the 1892 Act, and the Court in a recent case held that the Act of 1892 did not repeal or modify the provisions of the Act of 1866 in this respect, but was simply explanatory thereof.



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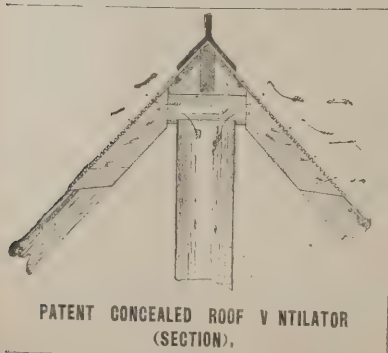
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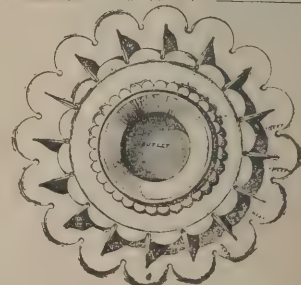
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NEW CATALOGUES.

WE have received from Mr. H. Munzing, 199 Upper Thames Street, a new price list and order-sheet for screwed American malleable iron and cast-iron tube connections, in which several novelties have been included. The list prices have been revised (many considerably reduced). The sale of these fittings, since their introduction by Mr. Munzing into this country fifteen years ago, has been steadily increasing on account of their quality, neat appearance, trueness of angles, and low prices compared with wrought-iron fittings of similar descriptions. As to the accompanying engravings—



FIG. 1.

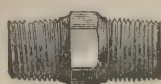


FIG. 2.



FIG. 3.

Fig. 1 shows a return band, of which two patterns, "open" and "close," are made. The return bends are specially suitable for making-up hot-water and steam coils. Fig. 2, the hexagon taper pipples, make a perfectly tight joint, and are easily fixed and disconnected by spanner. They are, therefore, in every respect superior to the plain pipples. Fig. 3, radiator union elbows, are specially handy for use in connection with radiators when only one valve is used. This union elbow enables one to easily connect and disconnect the radiator. Fig. 4, the eccentric reducing sockets, do away with the obstruction offered to the water by an ordinary reducing socket. The pipes come to rest on one level, thus creating a perfect clear waterway. Figs. 5 and 6, long twin tees, are specially suitable for water

connections, as can be seen from sketch. These long twin tees are so constructed as to avoid the friction the water sustains in an ordinary tee, thereby giving a far better circulation to the



FIG. 4.



FIG. 5.



FIG. 6.

water. To the already large assortment of first-class water and steam radiators as regards efficiency and design, Mr. Munzing has added another pattern (see fig. 7), which, being only

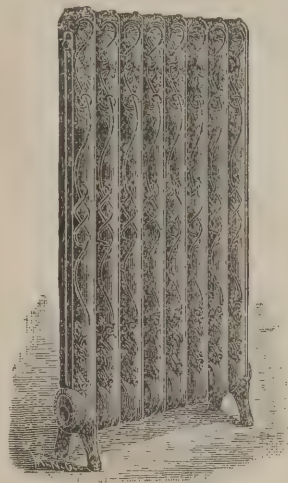


FIG. 7.

4½ inches wide at sections, is particularly suited for placing along the wall in narrow passages in offices, or wherever space is limited. The sections are connected by iron nipples forming a perfectly tight and durable joint. Mr. Munzing also keeps in stock a large assortment of American valves specially suitable for water and steam radiators, automatic air valves, automatic damper regulators, and tools and supplies for steam and hot-water fitters generally.

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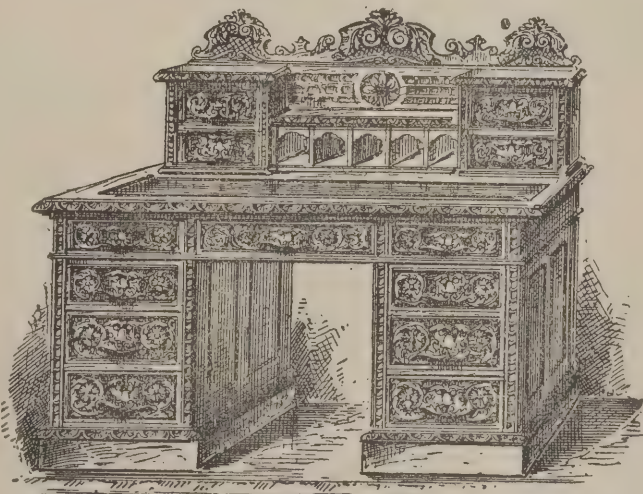
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BREACH OF BY-LAWS AT CROYDON.

AT Croydon on the 15th inst., Mr. S. Hurst, builder, was summoned at the instance of the Croydon County Council for using bad mortar in the construction of certain buildings in Elliott Road, Thornton Heath, contrary to the by-laws.

Mr. John Birch, building inspector to the corporation, stated that the defendant was building two houses in Elliott Road. The witness visited the buildings on January 30 and found that the material which was being used for mortar was garden mould mixed with lime. He told the foreman that he must not use that kind of material. The man explained that they had run short of sand, at the same time undertaking not to use that particular "mortar" again. The witness called again upon several occasions, and found that they were using coarse brick-kiln dust, garden mould and very little sand.

Mr. Thomas Walker, the borough surveyor, said he had the supervision of new buildings in the town. On January 31 he visited the works in question, and found very little mortar being mixed up. It was made chiefly from a heap of sifted garden mould close to the mortar heap, mixed with brick-kiln ashes and a little sand. The sand was most unsuitable, being too fine, and the material could not be called mortar. The witness went on to the building and found some of the bricks very inferior—the worst description of bricks, in fact—and he never saw work flushed up in the joints so badly. The witness told the foreman that better bricks and mortar would have to be used; but when he visited the building on Saturday last the same material was still in use. He should call the mortar a good imitation of mud. Good mortar, the witness said, should be composed of lime and good sharp sand, in the proportion of one to three, well mixed or compounded. The buildings were small double villas, to be let at a rental of 30% or 35% each.

The Chairman: Would the fact of the houses being built with this kind of mortar render them liable to be damp and dangerous to health? I have no doubt whatever that the dampness would come through as readily as through a piece of blotting-paper, and that in six years if the tenants drove a nail into the wall it would go in as easily as if the wall was composed of dry sand. The character of this building is the worst I have come across for many years.

The defendant's son said his father had built no fewer than 1,000 houses during the past thirty years, and he always used good materials. No doubt this work had been neglected

through his father's illness. He could not dispute the facts, however.

Mr. Bishop said that this was one of the worst cases he had ever heard of and was abundantly proved. The defendant would be fined 3*l.* 3*s.* and 2*l.* 9*s.* 6*d.* costs, or, in default of distress, twenty-one days' imprisonment.

The Town Clerk said he should require the defendant to pull down the houses from the top to the ground floor, or other proceedings might have to be taken.

RESTORATION OF SWANSEA CHURCH.

A SPECIAL vestry of the parish of St. Mary's, Swansea, has been held at the Old Church. The Vicar, in opening the proceedings, replied to some remarks which had been made as to the architectural value of the old building. He said that in the opinion of architects he had consulted there was no feature really worth preserving in the existing chancel, and if it came in the way of improvements it would be removed. The accommodation by the new plan would be 1,360 according to architects' estimates, which would mean easy accommodation for 1,500 persons, and the estimated cost was 26,000*l.* They had not as yet had any elevation or drawings of the proposed structure prepared. Alluding to the question of graves, the Vicar thanked the Morgan family for withdrawing their objections, and said that of the eighty graves within the area required they could only find representatives of eighteen, and these raised no objection.

Mr. Mason moved:—"That that part of the resolution passed at the vestry of July 21, 1892, authorising the Vicar and churchwardens to restore the church, be rescinded, and that they be now empowered to restore and rebuild the church on the plan now produced and explained by the Vicar, showing a nave 6 feet wider on the south side and 17 feet beyond the porch, and that the chancel be made 7 feet wider, the tower rebuilt, and the Herbert Chapel thrown open."

Mr. Philip Jenkins seconded.

Mr. J. Coke Fowler said the movement had his full sympathy and approbation, and he believed no difficulty could now interpose to prevent the excellent plan from being carried out.

The resolution was then put and carried.

Resolutions were afterwards carried decreeing that the application should be advertised, and that the work be not proceeded with for three months thereafter, and that the Mayor

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be requested to appoint three gentlemen to co-operate with the Vicar and churchwardens in seeing that the necessary work in connection with the graves should be carried out with decency and reverence.

Lord Swansea has written the following letter about the proposal:—

"Dear Sir,—I must offer you many apologies for not sooner replying to your letter. No one can feel greater annoyance than I do at the destruction of the old parish church, in which I worshipped with my friends from my earliest childhood until I was twenty-eight years of age. I think it wholly unnecessary, as it is a sound substantial fabric and as large as is convenient for the congregation. If the Vicar is so ambitious as to desire to build a cathedral, and if the inhabitants of Swansea and the public at large are ready to find him 20,000*l.* or 25,000*l.* to indulge his ambition, so be it, so long as St. Mary's is not disturbed. In my opinion, such a sum would be better expended in building four or five churches of more moderate dimensions in various parts of this populous parish, if they are wanted. The desecration of 800 or 900 dead bodies, is, to my mind, hideous and revolting. They will be found in every condition of decomposition, from black mould with a few bones, which I have seen in a village churchyard, capable of removal only by the shovel, to bodies in every stage of decomposition too disgusting to describe, and that in the midst of a dense population such as surrounds St. Mary's. We living men ought to protect and not to desecrate the remains of the dead. I have no question that an injunction could be obtained to restrain and prevent such desecration, which I think would be a disgrace to our community. This was the substance of the letter which I wrote to Mr. Williams, which ought to have been read at the meeting. I also recommended the beautifying of the existing building.—Yours truly,

"SWANSEA."

PHOTOGRAPHY IN MINES.

At the meeting of the North Staffordshire Mining Institute, held at Stoke-on-Trent, Mr. R. H. Cole presiding, Mr. Herbert W. Hughes, of Dudley, introduced the subject of "Photography in Mines." He stated that the slides which would be shown on the screen might be called unique, because this was the first time a set had been prepared, selected from results obtained by several operators. Mr. Sopwith in 1881 and 1882 was the first to obtain a complete series of views showing various

operations from the bottom of the shaft to the working place, but nothing seemed to have been done further in this country until about eighteen months ago, when Mr. Burrow and himself took up the experiments and obtained photographs of mining operations where the excavations were larger than was usual. His own results were obtained in the 30-feet seam of South Staffordshire, and his first experiments proved that methods of illumination which were successful in comparatively thin seams were quite useless in the large chambers of the ten-yard coal. The electric-light magnesium ribbon and ordinary flash lamps had been tried with little success, and it was only on obtaining more powerful illumination that good results were obtained. He used a lamp in which magnesium powder was burnt in the oxy-hydrogen blow-pipe, the light produced being intensely brilliant and active from a photographic point of view. In order to shorten the exposure, plates of great rapidity should be employed and the lens should work with a large aperture. He was in favour of a light, portable camera with all the movements locked by spring catches, as the audible sharp click produced at the moment each spring acted was of great assistance in the semi-darkness underground, proving to the operator that the various parts of the apparatus were in their correct position. The difficulties to be overcome in mine photography were not many, but were hard to surmount. His experiments seemed to show that double the illumination was required in a coal-mine compared with a metal-mine. The condensation of water on the lens and plate was perhaps the most difficult matter to avoid. Mr. Hughes subsequently showed over fifty slides of pictures taken below ground in the Cannock Chase mines, Cornwall, South Wales, the South Staffordshire thick seam, Germany, and the United States.

H.R.H. THE PRINCE OF WALES, K.G., attended by Colonel Stanley Clarke, visited the Royal Aquarium recently, and after thoroughly inspecting the International Yachting Exhibition and excellent loan collection, viewed the performances of the Boxing Kangaroo, Adelina Antonio's daring descent, the remarkable divers, including Ben Fuller, and Mdlle. Bob Walters and the lions. H.R.H. was received and escorted by Mr. Josiah Ritchie (chairman and managing director), Mr. J. W. Wilkinson (secretary) and Mr. E. A. du Plat (organiser of the exhibition). By request of His Royal Highness, Mr. Ritchie conveyed His Royal Highness's thanks to the various artistes engaged.



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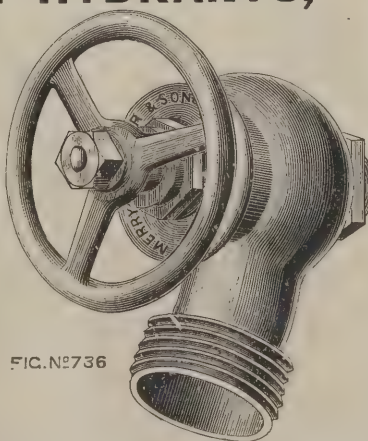


FIG. N°736



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THE INSANITARY CONDITION OF DUBLIN.

A MEETING of the Dublin Sanitary Association was held on the 15th inst., when the President said:—It is useless to attempt to conceal the fact that typhoid fever has made sad ravages in this city during recent years. I regret to find from statistics which have been kindly supplied to me by the Registrar-General, that there has been a very perceptible increase in the number of deaths from typhoid in Dublin in 1893 as compared with 1891 and 1892, and with the average of the ten years 1881-90. The number of deaths in the suburbs was, in 1891, 48; in 1892, 23; and in 1893, 42; and the rates were, for 1891, 4·6; for 1892, 2·2; and for 1893, 4·0. The public health committee, in their report, endeavour to show that typhoid is increasing in the suburbs as well as in the city proper. The figures I have quoted show that this is not the case. The undue prevalence of typhoid fever in Dublin is not denied by the public health committee; indeed, they are advised by the superintendent medical officer of health that "with the exception of St. Helens and Belfast, Dublin has the highest typhoid fever death-rate in the United Kingdom," and they appear to have adopted Sir Charles Cameron's view that the organisms which produce typhoid seem to have established themselves in Dublin and Belfast on the congenial soil afforded by low-lying, badly drained sites saturated with organic matter, and this has caused the disease to become endemic, as diphtheria has, within the last thirty years, become endemic in many European and American cities. This is certainly not a very agreeable view of the situation, and it is the duty of all who have the interests of the city at heart to bestir themselves, and see if some practical measures cannot be adopted to remove Dublin from the unenviable position which it now occupies amongst our great centres of population. I do not think that the inquiry committee have much reason to complain of the way in which the public health committee have dealt with their report. The public health committee regard as by far the most important part of the report that which refers to the drainage of the subsoil. They are probably right in this. There was one cause to some extent peculiar to Dublin, namely, the saturated condition of the subsoil, which appeared to afford special facilities for the growth and development of the organisms which are still generally believed to produce typhoid fever. I quite agree with the opinion expressed by a writer in the *Medical Press* of November 29, 1893, "That there exists the greatest doubt that subsoil saturation is the cause of the typhoid fever in Dublin,"

in the sense that it is the only cause. I am far from thinking that any one cause is responsible for the spread of the disease in Dublin; but I think enough has been said in the report to justify Dr. Reynold's opinion, and to make it incumbent on the Corporation to take some steps to put it to the test of careful and impartial experiment. *Apropos* of this subject of subsoil saturation, I hope some effort will be made to investigate the alleged waste of Vartry water by leakage into the soil. The city engineer denies that the waste occurs in the distributing mains, but I think it is quite clear that a great deal of waste Vartry water finds its way into the subsoil—whether from the mains or service pipes is immaterial for my purpose—and helps to increase the saturation of which we complain. In addition to their proposal that a system of subsoil drainage should be carried out in Dublin, the inquiry committee made several recommendations which I have not time to refer to at any length. It is of the utmost importance that urban sanitary authorities should be informed of every case of zymotic disease which occurs within their respective districts. The "Infectious Diseases Notification Act, 1889," was passed with this object, but unfortunately it is only an adoptive Act, and even where it has been adopted it is often allowed to become a dead letter. The inquiry committee suggest that efforts should be made to secure more complete returns of cases of typhoid fever under this Act, and that the townships should put it in force. The public health committee appeal to this association to point out to the medical profession in Dublin their flagrant disobedience of the law which, under a penalty, requires them to notify cases of infective disease. It is an admitted fact that there is no more certain source of typhoid fever than polluted milk. The testimony of many witnesses fully justify the conclusions of the commissioners, that cowsheds and dairies were situated in improper places within the municipal area, and that some of them possessed no adequate appliances for drainage, cleanliness and ventilation. This remark applied also to slaughter-houses, and is as true of the present state of things as when it was written, more than thirteen years ago. The condition of both dairy yards and slaughter-houses has constantly engaged the attention of the Council of this Association. The report on dairy yards, which is appended to the report of the inquiry committee, reveals the existence of a shocking state of things. It states that there are cow-yards which are a disgrace to the city and a source of danger to its inhabitants. The yards, as a rule, are kept in a condition of horrible filth; one of them is situated close to the

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Corporation refuse dépôt in Marrowbone Lane, and others are under the very walls of our two large fever hospitals. As a rule the yards are unpaved, and large heaps of rotting manure are heaped up in corners. It was evident to the committee that the by-laws of the Corporation had not been enforced in the case of these yards, and they recommended that official registration and fortnightly inspections should be introduced, and that there should be compulsory closing of such yards as may be considered dangerous to the public health.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual dinner was held at the Spread Eagle Hotel, under the presidency of Mr. G. Fish. Amongst those present were Mr. Woodsend, ex-president; Councillors Wright and Skerritt; Messrs. Messom, Hodson, Williamson, Dennett, J. Shaw, Maule, H. Vicars, F. Fish, James Wright, J. H. Vicars, A. G. Bell, Gilbert, Gabbitass, R. Simpson, J. Cooper, F. Atkin, secretary, F. Messom, jun., Keeling, Pillatt, Barlow, Wartnaby, A. Huskinson, Brownell, &c. Mr. J. J. Adams occupied the vice-chair.

Following the loyal toasts, the Chairman proposed "Success to the Master Builders' Association." He felt that in accepting the office of president of the Association for the coming year he would, as far as lay in his power, promote the Association's interests in every possible way. There were many matters that were likely to be brought forward at their general meetings, and he would ask every master builder and every member of the Association to assist him by attending in good numbers, and giving their best advice for the benefit of the trade generally. There were several important questions that would require a great amount of study, both as regards the employers and those whom they employed; for instance, in regard to the general working hours of the trade. To his mind—and he did not know whether they would all agree with him—the present working hours of the trade were radically wrong. They had one class of men working at one time and another class at another time, and the fact was they did not know where they were. He hoped that during his year of office they would be able to bring about an arrangement whereby all their men would begin and leave off work at a regular stated time. That was a question of very great importance to the building trade of Nottingham, and he intended to raise it at the next meeting of the Association. He hoped that the schedule of prices would soon be put into force. The large gathering of members

that evening spoke well, he thought, for the future success of the Association, and he hoped that, with their ready help during the ensuing year, they would be able to improve the building trade, not only as affecting themselves, but also those whom they employed.

Mr. Woodsend responded, remarking that the success of the Association, in which they were all deeply interested, fully justified their high anticipations for the future. As their President during the past year, it had often been his duty to preside at meetings very scantily attended, and he could not help thinking that that was not the way to promote the success of the Association. To insure its success a certain amount of work, attention and thought were needed to be brought to bear upon its interests. Since its reconstitution, three years since, the Association had made very fair progress, its members had steadily increased and at the present time it had a substantial balance at the bank. He took it they were not combined for the purpose of accumulating funds, but it was satisfactory to know that the subscriptions came in very well indeed, and altogether the Association was in a prosperous condition. The question now before them was how they were to insure the success of the Association in the future? In Mr. Fish they had a very excellent president, and he was sure Mr. Adams would prove a very useful vice-president. He owed a debt of gratitude to Mr. Fish for the kind way he had assisted him during the past year, and his thanks were due to the members of the committee and also to Mr. Atkins, who had ever been ready to further the interests of the Association in his usual urbane and pleasant manner. He could wish that the trade of the town was in a better state than at present. As they all knew, they entered upon the past year with the hope that certain public works would be started in the town, but owing to the unfortunate coal strike and other circumstances, the money market had been made so difficult that the M. S. and L. Railway Company had had to postpone their proposed venture for some time to come. He hoped the delay would not be long protracted, because, when started, the work would give a good fillip to the building trade.

Mr. Vicars submitted "The Town and Trade of Nottingham," and Councillor Wright, in responding, alluded to the proposal to improve the river Trent for navigable purposes, and agreed that such scheme, if carried out, would prove very beneficial to the trade of Nottingham and district.

The annual report, which was then read by the Secretary, stated that the year just closed had still been marked by

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general depression of trade, and continued:—"At the opening of the year it was hoped that new railway works and other public buildings proposed to be erected would soon be started and so give an impetus to the trades represented by the Association. But those works, unfortunately, were still in abeyance. Although the building trades generally had been quiet during the year, the officers of the Association had been actively engaged on one or two important matters which had needed all their acumen to settle satisfactorily. Perhaps the most important was the joiners' dispute in April last. The schedule of prices was still in the hands of the committee; as was also the apprenticeship question. The Association was now affiliated with the parent society of Great Britain. The numerical strength of the Association had increased and its finances were in a satisfactory condition. The death was recorded of one of the members, Mr. R. Dennett. The new members during the year numbered nine."

The Vice-Chairman proposed "The Visitors," to which toast Mr. Brownell replied.

REGISTRATION OF PLUMBERS.

EX-LORD PROVOST MATHEWSON presided at the annual public meeting held in Dundee in connection with the National Registration of Plumbers, and there was a good and representative attendance of master and operative plumbers and public representatives from various parts of the district, which embraces the counties of Forfar, Fife and Perth. The Chairman in opening the meeting laid stress on the fact that of late years more and more interest has been evinced by the foremost scientific men throughout the whole of Europe in questions relating to the public health, and he pointed out that whatever efforts scientific men and public authorities might make in the cause of public health would be in vain without good plumbing. Fortunately the public were now awakening to the vital importance of this question, and were heartily in sympathy with the movement for the registration of plumbers. The Secretary read the annual report of the district council, by which it appeared that the movement was making steady progress in the estimation of the plumbing trade and the public. Dealing with the question of the local plumbers' classes, the Council earnestly recommended that masters should take an interest in the attendance of their journeymen and apprentices at these classes, and that apprentices should have an attendance card to show

to their masters, and the hope was expressed that the time was not far distant when masters would make it a condition of apprenticeship that their apprentices should regularly attend the plumbing classes. Plumbers and others interested in good plumbing were earnestly recommended to support the Bill for the Registration of Plumbers now before Parliament. It was reported that evening classes for plumbers would shortly be opened at Perth. The Chairman presented a number of certificates granted by the Worshipful Company of Plumbers, London, to local plumbers.

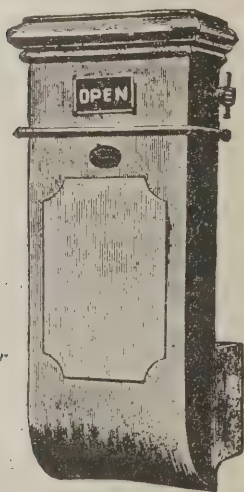
Professor Matthew Hay, of Aberdeen University, occupied the chair at the last meeting of the Aberdeen District Council for the National Registration of Plumbers, of which he is the president. The results of the examinations for the prizes and certificates of merit offered by the Worshipful Company of Plumbers were reported and considered satisfactory. The date of this year's annual meeting in connection with the District Council was fixed for February 24, and it was decided that the prizes and certificates of merit won by the successful students and the certificates of registration granted to local plumbers should be presented at that meeting.

WATER SUPPLY IN LONDON HOUSES.

A LETTER from Mr. R. W. Edis, F.S.A., appeared in the *Times*, stating that the water company's inspectors declined to allow a three-gallon flush in some houses designed by him. Sir F. Bramwell, C.E., stated that a two-gallon flush was ascertained to be adequate by Lord Methuen's Commission. Some other letters on the subject appeared this week.

Mr. Edis wrote:—"I am quite aware that the regulations of 1872 provided for a two-gallon flush, which was doubtless at the time thought sufficient; but, to quote the words of the report of the special committee of the Sanitary Institute, published October, 1893, "It should be borne in mind that sanitary drainage was at that time (1872) little understood, and that there was little or no experience as to the amount of flush necessary in order to meet sanitary requirements," and "no evidence at all was given as to the amount of water the waste-preventers for closets should discharge in order to fulfil sanitary requirements."

I find from the report which I have quoted that, although in the majority of towns the regulations as to water-flush impose a limit of two gallons, the limit in Edinburgh is three gallons



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and in Carlisle unlimited, and that the opinion of the special committee who drew up this report, after exhaustive tests made by them in the thirteen exhibitions held by the Institute during the past sixteen years, is "that the limit of the quantity of flushing-water to two gallons is very undesirable for any kind of closet, and altogether prevents the use of a number of excellent forms of valveless closets which are in accordance with the by-laws made by the London County Council under the Public Health (London) Act, 1891"; and after giving most excellent reasons as to the two-gallon flush not being sufficient in many cases to clear the closets, especially where the contents contain infection germs, they state emphatically that the minimum discharge should not be less than three and the maximum not more than three and a half gallons of water at each flush.

I am sorry that I, without intention, did the County Council an injustice, as from a letter received from Mr. Shirley F. Murphy, their medical officer of health, I find they have already moved for a three-gallon flush, and are in correspondence with the Local Government Board for an amendment of the water companies' regulations.

With regard to the particular case referred to in my first letter, the water company's agent insisted on the valves being taken out and two-gallon wastes substituted, the result being that the flush is utterly insufficient, and, in my opinion, dangerous to health, and at present there is no appeal from these insanitary and arbitrary regulations.

Mr. H. Saxon Snell writes:—A large majority of those who have interested themselves of late years in endeavouring to improve the sanitary arrangements of the Metropolis will regret that Sir Frederick Bramwell, by his letter published in your issue of the 16th inst., expresses an opinion that the regulation laid down twenty-two years ago by Lord Methuen's Commission as to the capacity of the flushing cisterns of water-closets should not, as is now proposed, be altered so as to provide a three-gallon instead of, as hitherto, a two-gallon flush.

Mr. Edis and Mr. Ernest Turner, two architects of considerable practice, have addressed you upon the subject urging the alteration, and inasmuch as these gentlemen, in common with myself and most other architects and engineers, have had bitter experience of the failure of the two-gallon system, the question is at least worth further investigation.

The population of London, according to the latest returns, is 4,306,411, and taking into consideration how many are infants or old, infirm and sick, it may be assumed that the proposed addition of one gallon of water each time a closet is used would

not amount in the aggregate to more than four million gallons daily. The cost of pumping this additional quantity could be but a fractional part of the cost of altering what Sir Frederick Bramwell calls the "uneconomical form of water-closet" at present in general use.

It has been clearly proved from the experiments lately conducted by the Sanitary Institute that wash-out or pan-and-trap closets of the best kind cannot be properly flushed with two gallons of water, and the only other form at present known that might meet the desire for more economical consumption is the valve-closet, but it has not been proved that two gallons is sufficient to flush even this expensive form of apparatus.

A valve-closet costs quite 2½ more than a wash-out or pan-and-trap closet; and assuming, therefore, that one apparatus would be required for each ten of the population of London, and it were made compulsory that this more expensive form should be generally used, the total additional cost to the rate-payers in London only would amount to no less a sum than 861,282½, as against the comparatively small annual outlay for extra pumping resulting from the proposed increase of the size of flushing cisterns. The conclusion is obvious.

Sir Frederick Bramwell calls attention to the fact "that two gallons of water occupies 3 feet 9 inches in length of 4-inch pipe, and is therefore a very adequate liquid piston for the clearance of that pipe." But he overlooks the fact that the soil-pipe of the present day is of a very different character to that of twenty-two years ago.

Then it was unventilated, and consequently the suction caused by the "liquid piston" he refers to not only cleared out the soil-pipe, but at the same time effectually unsyphoned every trap connected with it, the result being that after the water had left the pipe a regurgitation of foul sewage-gas occurred, which found its way into the buildings through the unsyphoned traps not only of the water-closets, but of the sinks, lavatory basins and cisterns, all of which in those days were allowed to pass into the soil-pipes.

Thanks, however, to the persistent efforts of sanitarians these ills are becoming things of the past, and the public are now fully alive to the absolute necessity of ventilating soil-pipes and otherwise preventing the introduction of sewer-gas into their dwellings.

The powerful and objectionable effect of the liquid piston in drawing off the contents of water-closet traps having thus been done away with, will not Sir Frederick Bramwell, on reconsideration, admit that a greater body of water is now necessary

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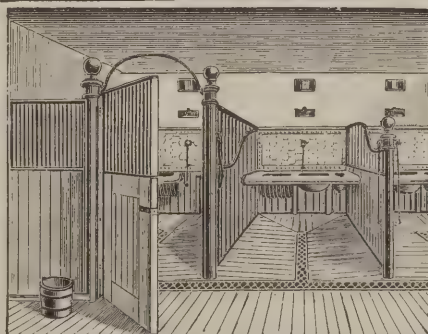
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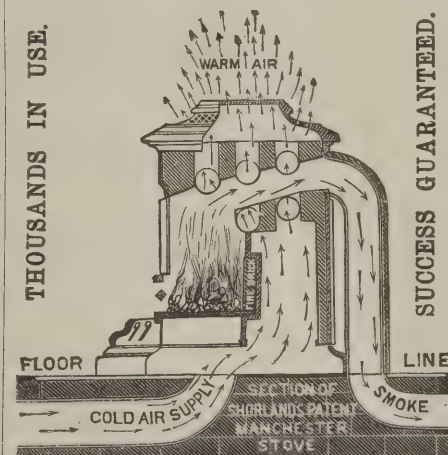
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to properly clear the soil-pipes, and will he say that the proposed minimum of three gallons of water per flush would even then be so powerful as the two gallons laid down under such different conditions twenty-two years ago?

Mr. C. Fitz Roy Doll writes:—Sir Frederick tells us that he assisted Lord Methuen's Commission twenty-two years ago in arriving at the conclusion that two gallons was ample. Was this conclusion arrived at after making experiments? If so, how is it that the Sanitary Institute, in its report dated November 1, 1893, after exhaustive experiments, condemns a two-gallon flush as totally inadequate?

If Sir Frederick Bramwell will read that report and examine the diagrams in it—or, better still, will go up to Parkes Museum and see the experiments—I have no doubt that he will admit that he made a mistake twenty-two years ago, which is not to be wondered at, as probably no science has made such rapid strides within the period named as that of sanitation.

Even if I take Sir Frederick Bramwell's statements with regard to Liverpool, Sheffield and Manchester as absolutely correct, it is no proof that two gallons are sufficient because the corporations of those enlightened boroughs allow that quantity.

With regard to the paragraph in which Sir Frederick informs us that "two gallons of water occupies 3 feet 9 inches in length of 4-inch pipe, and is therefore a very adequate piston for the clearance of that pipe," I can only express my surprise that Sir Frederick should use such a misleading argument.

He must know that the two gallons comes out of the flushing tank through a 1½-inch to a 2-inch pipe, and, therefore, it is impossible for it to act as a piston in a 4-inch pipe, inasmuch as the sectional area is as 1 inch to 4 inches, even taking a 2-inch flushing pipe, the largest ever used.

I scarcely think that the statement as to the 5,000,000 gallons of extra sewage per diem could be sustained upon investigation.

Many thousands of houses in London have had for years three-gallon flushing tanks, the notices for the removal of which, since the commencement of this agitation, has caused you, sir, to be overwhelmed with correspondence on this subject.

Furthermore, I maintain that in the better-class houses where two-gallon cisterns still exist the practice is to flush twice, whereby one gallon of water more is used than otherwise would be the case with a three-gallon flushing tank.

It may be true that "London already sins by its excessive

expenditure—not use—of water," but surely no one can call the use of water for sanitary purposes a sin.

Mr. E. Bailey Denton writes:—I was surprised to read Sir Frederick Bramwell's letter in your issue of to-day advocating the use of only two-gallon flushing cisterns for water-closets.

His argument that this quantity is sufficient may be, and probably is, correct in theory, but it is certainly incorrect in practice.

In London, at any rate, where I have had considerable experience, nine out of ten two-gallon cisterns do not in reality contain that given quantity of water; whilst in more cases than not it is impossible to place the cistern at such a height as to secure the head necessary to achieve the object aimed at. It therefore becomes advisable to increase the size of the cistern, and to allow a nominal flush of three gallons to remedy these drawbacks.

PARTY-WALL CASE.

AN award has been published in the case *Burkett v. Booker & Warne*, under the Metropolitan Building Act, 1855. Messrs. Booker & Warne, licensed victuallers, were pulling down the Daisy Public-house, Brompton Road, and gave notice of their intention to remove the party-wall between their premises and those of the adjoining owner, Mr. Burkett, a butcher. They intended rebuilding the wall and raising it to a greater height. Plaintiff claimed an injunction in the Chancery Division on the ground (as alleged) that a due party-wall notice under the Act had not been given by the defendants, who admittedly had not used the form approved and sealed by the County Council. The defendants, however, contended that the provisions of the Act had been substantially complied with, and this being so, it was not obligatory to use the usual form. Ultimately the plaintiff was advised to withdraw the objection, and by consent of both parties the Court ordered all questions including light and air to be referred to Mr. Thomas Batterbury, F.S.I., A.R.I.B.A., 29 John Street, Bedford Row, sole umpire, whose decision was to be final.

Mr. Frank Russell, counsel (instructed by Mr. George Clark, Gresham Street), appeared for plaintiff; Mr. H. H. Richardson, solicitor (of Messrs. Richardson & Carn, 2 Broad Street Buildings), conducted the case for the defendants.

Plaintiff claimed damages for disturbance in his business, including the expenses of his manager and family living away from the premises, which he contended were necessarily in-

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curred, and 20% fees of his surveyor, Mr. Stephens, in relation to the party-wall. Mr. C. W. Stephens and Mr. Walter T. Farthing, surveyors, gave evidence on behalf of the plaintiff.

Mr. Richardson contended that the party-wall was unfitted for the purpose of supporting any new building, and that the expense of pulling down and rebuilding the wall should be borne by the building owner and adjoining owner in due proportions, under section 88 of the Act of 1855. Plaintiff, he urged, was not entitled under the Act to any compensation for disturbance, nor to his surveyor's fees; and he declared that the shoring and screening which defendants had done was sufficient, and indeed more than plaintiff was entitled to in law.

With regard to the question of light and air, both parties placed a statement of law before the arbitrator, who examined the witnesses as to this in the absence of the parties and on the *locus in quo*. Mr. James D'Oyley (defendants' architect), and Mr. Albert E. Pridmore, F.S.I., 2 Broad Street Buildings, were examined on defendants' behalf, and the proceedings, which lasted over a period of six days, terminated.

Mr. Batterbury has now published his award, finding that the party-wall was not suitable for the erection of new buildings adjoining it, and that it must be pulled down. The expense of pulling down and rebuilding he determined must be borne by the building owners (Messrs. Booker & Warne), but if the adjoining owner subsequently made use of the extra height to which the wall was raised, he is to pay his proportion in respect thereof. The arbitrator further found that the plaintiff's claim to rights of light and air in relation to the premises was unfounded, and must be dismissed, as also were the claims for compensation for disturbance and surveyor's fees. The costs of the proceedings before the arbitrator, as well as in the Chancery Division, were ordered to be paid by plaintiff.

SMOKE-PREVENTING FURNACES.

At the meeting of the Civil and Mechanical Engineers' Society a paper was read by Mr. G. R. Steward, M.I.M.E., on "Smoke-preventing Furnaces," with the object of showing the progress that had been made of late years in perfecting these appliances and the present position with regard to the "smoke nuisance," for the author was of opinion that there was every evidence that very strict legislation would soon be brought to bear in this direction. A description was given of different varieties of furnaces, particularly mentioning several of the more successful

of the modern smoke-preventing furnaces, such as the "Schomburg," the "Vicors," the "Hodgkinson" and others. Amongst these furnaces were sprinklers, coking stokers, and hand and automatically-fired furnaces. The author also referred to means of preventing smoke other than the expensive methods above stated, such as the mechanical adjustment of furnace doors, &c. Having had some years of practical experience in providing a means for the better prevention of smoke, it became very evident to the author that more was required than a sufficient supply of air, which was in many cases the only object aimed at, for although that is an all-important element, smoke when mixed with air in large quantities is frequently hurried away too quickly into the flues, and the gases from the fuel in consequence do not combine, and a smoky chimney is the result. It is therefore necessary to hold in check the progress of the gases and air until they are wholly and completely commingled and perfect combustion has been attained. After many trials, extending over several years, the author had the satisfaction of witnessing a practically smokeless chimney, and this result was arrived at by means of a new and simple smoke-preventing appliance, which will be worked from the furnace front without expensive machinery and without alteration in the construction of the furnace. This appliance is so arranged as to produce an eddy of air or baffle inside the furnace. It can be made to suit any furnace. This invention was not particularly described, as the patents for it had not been completed yet in Germany and France, but so soon as they are, the author stated that he anticipated a great success for his invention, and felt confident that it would meet with universal appreciation, and he said this after many years' experience with furnaces both on land and at sea, for in early life he had been an engineer on English, Russian and Italian ships of war.

THE LOSS OF SCULPTURE AT THE CHICAGO EXHIBITION.

THE fire which destroyed the Columbus arch, peristyle, music-hall and casino, has left the east end of the grand court open to Lake Michigan, and the observer standing in front of the administration building sees nothing, says the *Inland Architect*, to intercept the distant view but the statue of the Republic rising out of the water, which is now shown to better advantage than ever before. From this point no ruins are visible, for the

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destruction was complete. The great buildings on each side still stand in all their pristine beauty and are not crumbling with the ravages of a wintry climate. A new perspective is now obtained and the court of honour takes on a new aspect, making it again an object of interest, notwithstanding the loss that has occurred. We have heretofore given the opinion that the Columbus arch, or water-gate, as it is officially called, was the most interesting structure architecturally (after the administration building) in the main group and the best of Mr. Atwood's works. It was such a monument that, if not preserved for as long a period as possible, ought to be reproduced in permanent materials. As the completion of the park will now be on a plan that will not be influenced by the location of the peristyle, there is a location where the Columbus arch could be reproduced with the grandest possible effect. It should be at the main entrance to the park from the midway plaisance, which is already a grand driveway, and serves the purpose for which it was intended, to connect Washington and Jackson Parks. As such a suggestion as this could not be practically carried out for many years to come, the realisation of one feature of the loss that has been sustained in the burning of the peristyle becomes stronger day by day. And that is the sculpture that adorned the arch. This consisted of the famous quadriga, representing Columbus in triumph in a four-horse chariot, which surmounted the top of it, the work of French and Potter, and the four groups of allegorical figures attached to the main piers of the arch, by Bela Pratt. In addition there were 128 statues on the pedestals of the main balustrades that surmounted the peristyle, music hall and casino, being enlarged reproductions of four figures modelled by Theodore Baur. All are gone for ever. There are no full-size moulds or models for any of these in existence except for the four figures by Baur. The quadriga and groups on pedestals were enlarged and built up from small models which fortunately are still in existence. It may be of interest in recording this loss to know that the quadriga cost the exposition 17,174 dols., which included the modelling by French and Potter of the groups of domestic animals with their attendants that were reproduced at the boat landings and are still in existence. The four groups modelled by Mr. Pratt cost 6,685 dols. So the loss of sculpture with the arch alone was 23,859 dols. The additional loss of the 128 figures on the peristyle, music hall and casino, represents an outlay of 17,520 dols. But these were all reproductions. However, it is worth recording, as showing the extent of sculptural adorn-

ment on the World's Fair buildings, that this fire destroyed what originally cost 41,379 dols. But the park commissioners have plenty more on hand. Around the basins and lagoons alone, without regard to the buildings, are the animal groups, by Kemys and Proctor, which cost 13,241 dols.; those of French and Potter, which cost 23,861 dols., and the Mac-Monnies fountain, which cost 50,000 dols., or a total of 87,102 dols. With the exception of the sculpture of the fountain these were all carefully painted and wrapped up to protect them from the weather before the park was returned to the custody of the commissioners.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 2441. Robert John Leggott, for "Improvements in apparatus for regulating fanlights."
- 2444. Benjamin Baines Dudley, for "Improvements in cantilever bridges, suspension bridges and similar structures."
- 2454. William Herbert Wainwright, for "A new or improved window-fastener."
- 2516. Edward Sydney Luard, for "Improvements in slam locks."
- 2528. Edward John How and Henry King, for "Improvements in sash fastenings."
- 2541. William Nolon, for "Improvements in the grooving of pulleys."
- 2576. George Justin Joseph Legrand, for "A new or improved domestic or other firegrate."
- 2594. Robert William Edlin, for "Improvements in valves."
- 2602. George Wright, for "Improvements in drawing instruments."
- 2663. William Joughin and Thomas Edward Jackson, for "An improved locking bolt and nut."

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T. Roger Smith, F.R.I.B.A., at University College, October 10,
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"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

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* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

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KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ABERDARE.—March 6.—For Erection of a Memorial Hall and Church Club. Mr. A. P. Jones, Bute Municipal Offices, Aberdare.

ABERKENFIG.—March 3.—For Building Police Station. Mr. T. Mansel Franklen, Clerk of the Peace, Cardiff.

AMBERGATE.—March 2.—For the Erection of Five Cottages. Mr. James Williams, Midland Railway, Derby.

ANERLEY.—March 2.—For External Painting of District School. Mr. A. G. Hennell, Oakwood, Mayow Road, Forest Hill.

ANTRIM.—March 5.—For Building Lunatic Asylum at Holywell. Mr. J. Lanyon, Architect, Northern Bank Chambers, Royal Avenue, Belfast.

BERMONDSEY.—March 5.—For Supply of Ballast and Sand, Drain Pipes, Lime, Sewers' Ironwork, Ironmongery, Printing and Stationery, Portland Cement, Oilman's Goods, Coals, Shoeing Horses, Veterinary Attendance, Disinfectants, Scavengers' Brooms, &c. Mr. J. Harrison, Town Hall, Spa Road, S.E.

BISHOP'S STORTFORD.—March 5.—For Supplying Steam Cooking and Heating Apparatus at the Workhouse. Mr. Henry Baker, Clerk to the Guardians, Bishop's Stortford.

BLOXWICH.—March 12.—For Building Infants' School. Messrs. Bailey & M'Connell, Architects, Bridge Street, Walsall.

BRADFORD.—March 9.—For Building Engine-house, Engine-bed and Store-room. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

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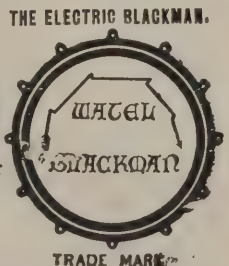
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BRIGHTLINGSEA.—March 5.—For Improvements and Re-benching Chapel. Mr. Charles Pertwee, Architect, Bank Chambers, Chelmsford.

BRIGHTON.—March 8.—For Construction of Swimming-bath, North Road. Mr. Francis C. J. May, Borough Engineer, Town Hall, Brighton.

BRIGHTON.—March 29.—For Constructing a Concrete Groyne, Storm-water Outlet, and an Overflow Chamber on the Beach, opposite Western Street; for Constructing a Storm-water Outlet and Making Additions to the Existing Groyne on the Beach opposite the Old Steine; for Constructing about 980 Yards of Brick Sewers, 8 Feet in Diameter, 562 Yards of Brick Sewers of Smaller Dimensions, and certain Pipe Sewers. Mr. Francis J. C. May, C.E., Town Hall, Brighton.

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BUCKHURST HILL.—March 3.—For Enlargement of the Boys' Board School. Mr. E. Egan, Architect, Chigwell.

CAMBERWELL.—March 5.—For the Supply of Guernsey Granite, Kentish Rag, and Flint and Paving Stone, Lime, Cement and Tar Paving. Mr. C. W. Tagg, Vestry Hall, Camberwell.

CHERTSEY.—March 19.—For Building Infirmary and other Additions to Workhouse (confined to Local Builders). Mr. C. Welch, Architect, London Street, Chertsey.

CO. SUTHERLAND.—March 5.—For Construction of Three Harbours. Mr. James Barron, Engineer, 7 Union Terrace, Aberdeen.

FLEET, HANTS.—For Building Residence. Messrs. Ludford & Tulloch, Architects, 39 Victoria Street, S.W.

GLASGOW.—March 5.—For Works in Construction of Gate Lodges, Waiting-rooms, &c., at Botanic Gardens. Mr. A. B. McDonald, City Engineer, 64 Cochrane Street, Glasgow.

GRANGE-OVER-SANDS.—March 14.—For Building Three Villas. Mr. Stephen Shaw, Architect, Kendal.

HALIFAX.—March 5.—For Taking-down Old Buildings and Erection of Schools. Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

HARWICH.—March 6.—For Building Board Schools, Boundary Walls, &c., Upper Dovercourt. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

HEMSWORTH.—March 6.—For Supplying and Laying Pipe Sewers. Mr. Richardson, Surveyor, Imperial Buildings, Bond Street, Leeds.

HORWICH.—March 13.—For Building Cottage Hospital. Mr. Henry Shelmerdine, Architect, Hunt's Bank, Manchester.

HULL.—March 9.—For Supply of 12,000 Tons of Stone for Macadamising. Mr. A. S. White, Town Hall, Hull.

HYDE.—March 7.—For Building Fire Station. Mr. J. Mitchell, Borough Surveyor, Town Hall, Hyde.

ILMINSTER.—March 12.—For Extension of Grammar School and Girls' School, Fittings for Lavatory, &c. Messrs. Price & Wooler, Architects, Weston-super-Mare.

IPSWICH.—March 13.—For Building Girls' School and Additions to Infants' School. Mr. E. F. Bisschopp, Architect, 10 Museum Street, Ipswich.

KENDAL.—March 16.—For Additions to St. Thomas's Schools. Mr. Stephen Shaw, Architect, Kendal.

KENSINGTON.—March 8.—For Formation of Roads, Paths, and Airing Courts at the Infirmary in Marloes Road. Mr. T. W. Aldwinckle, 1 Victoria Street, S.W.

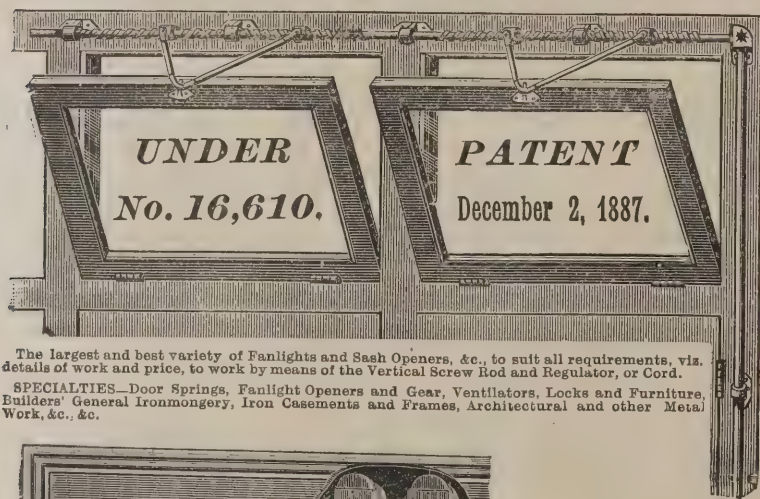
KIDDERMINSTER.—For Additions to House. Mr. J. M. Gething, Architect, Oxford Chambers, Kidderminster.

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PEMBERTON.—For Building Sunday School and Class-rooms. Mr. Richard Pennington, Architect, Clarence Chambers, Wigan.

PONTYPRIDD.—March 8.—For Building Seven Houses. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

PUDSEY.—March 5.—For Building Twenty-six Through Houses. Mr. H. Hodgson, Architect, 27 Kirkgate, Bradford.

ROTHERHITHE.—March 6.—For Execution of Works of Sewerage and Drainage. Mr. James J. Stokes, Vestry Offices, Lower Road, Rotherhithe.

SALFORD.—March 15.—For Building School Board Offices. Messrs. Woodhouse & Willoughby, Architects, 100 King Street, Manchester.

SHREWSBURY.—For Restoration of St. Mary's Church. The Vicar.

SILLOTH.—For Building Infants' School. Mr. G. Armstrong, Architect, 45 Lowther Street, Carlisle.

SKIPTON.—March 2.—For Supplying and Laying Pipe Sewer, &c. Messrs. Barber, Hopkinson & Co., Engineers, Temple Street, Keighley.

ST. HELENS.—March 19.—For Supply of Materials for a Period of Twelve Months. Mr. Wm. John Jeeves, Town Hall, St. Helens.

SWINDON.—March 3.—For Building Two Cottages. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

TOTTENHAM.—March 13.—For the Supply of Broken Granite, Gravel, Flints, Lime, Cement, &c., and the Performance of Smith's Work, Repairing and Sharpening Tools, &c. Mr. Edward Crowne, Clerk to Local Board, Tottenham.

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WATFORD.—March 3.—For Erection of a Hospital for Infectious Diseases. Mr. H. Morten Turner, 66 High Street, Watford.

WATFORD.—March 5.—For Additions to Police Station. Mr. Urban A. Smith, County Surveyor, 28 Victoria Street, Westminster.

WEST HAM.—March 13.—For Erection of a Block of School Buildings and Appurtenances at Upton Park. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

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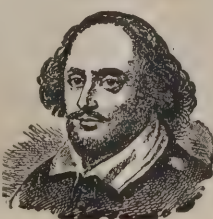
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F. Dupont, Colchester	4,471 0 0
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JAS. PAYNE, Hemel Hempstead (accepted)	3,824 0 0

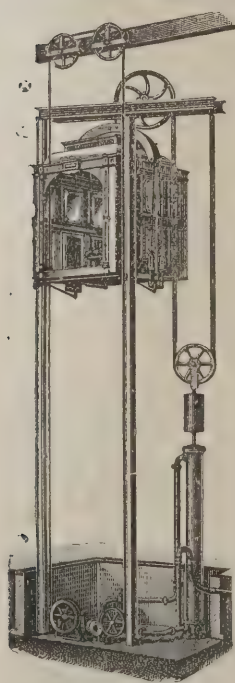
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Foster & Dicksee	24,374 0 0	185 0 0
Shillitoe	23,850 0 0	250 0 0
Lathey Bros.	23,527 0 0	230 0 0
Holliday & Greenwood	23,333 0 0	—
Boyce	22,840 0 0	153 0 0
Nightingale	22,835 0 0	—
Johnson & Co.	22,700 0 0	248 0 0
Perry & Co.	22,462 0 0	250 0 0
L. H. Holloway	22,377 0 0	250 0 0
Holloway Bros.	21,972 0 0	200 0 0

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St. James's Palace, London	Burnley, Holy Trinity Church
Sherborne Abbey	Crawley Parish Church
Sydney Town Hall, N.S.W.	Corbridge-on Tyne Parish Church
Durban Town Hall, S.A.	Windermere Church
Royal Military Exhibition, &c., &c., &c.	Eiffel Tower, Paris
	GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.
	SILVER MEDAL—PARIS, 1889.

LONDON—continued.

For Erection of New Church of St. Andrew, Whitehall Park, Highgate. Mr. F. HAMMOND, F.R.I.B.A., Architect, 1 Circus Place, London Wall.

	A	B	C
Woodward & Co.	£8,490	£710	£295
B. E. Nightingale	8,220	512	148
Dove Bros.	7,975	625	265
Patman & Fotheringham	7,921	944	181
Gould & Brand	7,306	820	190
Lawrance & Sons	7,245	892	230
L. H. & R. Roberts	7,236	650	140
Kilby & Gayford	7,220	355	190
J. S. SCOTT (accepted)	6,673	974	183

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B. Extra if Kentish Rag Facings.
C. Deduction if Bath Stone Dressings.

For Repairs to Cornish Boiler, for the Commissioners of Paddington Public Baths.

B. Higham, London	£298	10	0
Smith, Chelsea	240	0	0
Bone, Borough	225	0	0
Horton, Southwark	225	0	0
Fowler, East Ham	216	10	0
Hodge, Millwall	208	0	0
Fraser, Commercial Road, E.	200	0	0
Robinson, Greasborough	197	10	0
Forbes, Blackwall	196	0	0
Flavell & Churchill, East Greenwich	187	12	6
Crabtree, Yarmouth	176	10	0
Symons, Chelmsford	170	0	0
Freeman	148	0	0
C. ASTLEY, Bolton (accepted)	89	0	0

For Alterations and Additions to Nos. 91 and 93 Rye Lane, for Messrs. Davies Bros., Drapers, &c. Mr. JOHN JAS. DOWNES, Architect, 11 The Parade, Lewisham High Road, S.E.

R. Soper	£536	10	0
H. Lorden & Son	533	0	0
W. Parker	470	0	0
H. L. Holloway	465	0	0
S. R. Best	427	10	0
W. T. CHAMPION, (accepted)	375	0	0

LONDON—continued.

For Additions to St. Matthew's Mission Church, Yerbarg Road, Upper Holloway, N. Mr. F. HAMMOND, F.R.I.B.A., Architect, 1 Circus Place, London Wall.

J. & H. Cocks	£1,035	0	0
George Cox	977	0	0
Godson & Sons	795	0	0
DOVE BROS. (accepted)	735	0	0

NOTTINGHAM.

For New Borough Club, King Street, Nottingham. Mr. GILBERT S. DOUGHTY, Architect, 14 Fletcher Gate, Nottingham and Matlock.

J. H. Vickers	£4,852	0	0
J. Hutchinson	4,660	0	0
T. Fish & Son	4,660	0	0
J. F. Price	4,654	0	0
A. B. Clarke	4,650	0	0
H. Vickers	4,640	0	0
Dennett & Ingle	4,625	0	0
J. J. Adams	4,600	0	0
J. Wright	4,595	0	0
J. Cooper	4,503	0	0
W. Woodsend	4,497	0	0
G. A. Bell	4,491	0	0
W. Maule	4,460	0	0
T. Cuthbert	4,419	0	0
J. Shaw	4,410	0	0
Dennett & Williamson	4,325	0	0
J. Hodson & Son	4,269	0	0
T. BARLOW (accepted)	4,050	0	0

PLAISTOW.

For Tar Paving Playgrounds and Yards, Grange Road Schools, Plaistow, for the West Ham School Board. Messrs. J. NEWMAN & JACQUES, Architects, 2 Fen Court, E.C.

Lagdon & Crawford, Old Ford	£486	10	0
J. Smart, Finsbury Park	442	19	0
W. Merrin, Reading	414	0	0
Bensted & Son, Maidstone	412	0	0
March & Co., Bromley, Kent	373	0	0
J. J. Ingham, Bradford	368	6	8
Asphalte Limestone Concrete Co., London	344	8	2
Hobman & Co., South Bermondsey	325	0	0
CONSTABLE & Co., London (accepted)	319	0	0

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GOLD MEDAL,

LONDON, 1882.

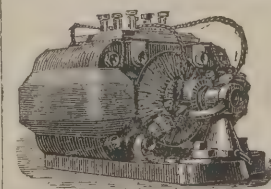
SILVER MEDAL,

PARIS, 1881.

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PLYMOUTH.

For Additions to the Hotel at Two Bridges, Princetown, Plymouth, for Mr. H. Trinaman. Mr. JAMES HARVEY, M.S.A., Architect and Surveyor, 7 Courtenay Street, Plymouth. Quantities by the Architect.

J. Dockett, Horrabridge	£698	0	0
W. G. Good, Plymouth	695	0	0
J. A. Dennis, Tavistock	695	0	0
J. Julian, Truro	655	0	0
W. E. Blake, Plymouth	630	0	0
Blackett & Shepperd, Plymouth	626	15	0
A. Andrews, Plymouth	618	0	0
J. H. Pomroy, Ashburton	558	9	0
TOOP & SONS, Horrabridge (accepted)	519	10	0

RUSHDEN.

For Building House in Church Street, Rushden, for Mr. W. H. Darnell. Mr. H. ADNITT, Architect, Rushden.

Lovell	£470	0	0
T. Willmott	464	10	0
Bayes & Son	460	10	0
T. & C. Berrill	457	0	0
HY. KNIGHT (accepted)	435	0	0
H. Sparrow	424	0	0

SALTERHEBBLE.

For Alterations and Additions to House at Salterhebble. Mr. ARTHUR G. DALZELL, Architect, Albany Chambers, 15 Commercial Street, Halifax.

Edward & Ackroyd, Stainland	£559	3	4
J. Charnock & Son, Halifax	504	6	4
H. Greenwood, Halifax	436	17	0
G. Townsend & Son	433	0	0
J. Whatnough	401	7	6
S. Earnshaw	399	16	11
A. Darnes & Son	398	0	0
C. Ramsden	395	0	0
T. Sutcliffe	383	10	11
F. Lomas & Sons	375	10	0
A. Steele and Son	370	9	6
Fielding & Bottomley	366	0	0
S. & W. Pickles	360	0	0
B. & T. H. RILEY (accepted)	347	10	0

STRATFORD.

For Construction of Roads and Sewers at Stratford, West Ham, for the West Ham School Board. Messrs. J. T. NEWMAN & JACQUES, Architects, 2 Fen Court, E.C. Holbrook Road.

S. Griffiths, Kingsland Road	£2,500	0	0
G. Sharpe, Stratford	2,370	0	0
Gregar & Son, Stratford	2,187	0	0
S. Kavanagh, Surbiton Hill	1,991	0	0
J. Burrill, Manor Park	1,830	0	0
W. J. Maddison, Canning Town	1,825	0	0
Rutty, Bromley-by-Bow	1,690	0	0
Lagdon & Crawford, Old Ford	1,633	0	0
J. JACKSON, Leyton (accepted)	1,494	0	0
F. Adams, Wood Green	1,469	0	0

Manor Road.

S. Griffiths	3,760	0	0
S. Kavanagh	2,913	0	0
G. Sharpe	2,475	0	0
W. J. Maddison	2,455	0	0
Gregar & Son	2,430	0	0
J. Burrill	2,130	0	0
Lagdon & Crawford	2,130	0	0
Rutty	2,099	0	0
J. Jackson	1,894	0	0
F. ADAMS (accepted)	1,798	0	0

WAINFLEET ALL SAINTS.

For Construction of a Cattle and Sheep Market for the Wainfleet All Saints Market Company, Limited.

T. Elmes, Wainfleet	£285	15	5
J. T. TURNER, Wainfleet (accepted)	284	6	0

WIMBLEDON.

For No. 3 Contract, Wimbledon Park Estate, for the Wimbledon Park Land Company, Limited. Mr. WILLIAM HUNT, Architect and Surveyor, 5 York Buildings, Adelphi, W.C.

King	£653	0	0
Mears	648	0	0
NICHOLS (accepted)	555	0	0

WOLSTANTON.

For Building Board School for 265 Infants and 600 Mixed Scholars, for the Wolstanton School Board. Mr. A. R. WOOD, Architect, Tunstall.

CHARLES COPE, Tunstall (accepted)	£6,584	0	0
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TRADE NOTES.

WE are asked to state that the amount of Messrs. Kelby & Gayford's tender for factory and stabling at Whitechapel was 6,684*l.*, and therefore 1*l.* above the tender accepted, not 29*l.* below it as announced in last week's issue. The figure 8 must have been mistaken for 5.

THE new offices for the Cheshire Lines Railway, Liverpool, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Grinnell Sprinkler is continually saving buildings in all parts of the world from total destruction by fire. The latest report comes from Tourcoing, France, where a fire started in the carding-room of the mills belonging to MM. V. Valentin et A. Flipo. Two Grinnell heads at once opened and extinguished the fire, the damage being insignificant. MM. Valentin et Flipo are highly pleased at the efficacy of the Grinnell Sprinklers, which were erected in their mills as far back as 1886.

AT the National Dental Hospital, Great Portland Street (Mr. A. E. Thompson, Leadenhall Buildings, architect, and Mr. J. Andrews, Mount Street, W., builder), the various works of heating, ventilation, hot-water supply, gas services, electric bells, cooking range, &c., have been carried out by Messrs. Russell & Co., 42 Berwick Street, Oxford Street, W. The heating is on the low-pressure system, with radiators and coils in the various halls, laboratories and rooms. The hot-water supply to the staff and students' lavatories, and to the various lavatories in the extraction and stopping rooms, is worked conjointly from the range and from a special hot-water supply apparatus fixed in the stoker's. For the ventilation, two main extraction-flues have been formed in the building, with cast-iron flue pipes from stoker's carried up in each, into which flues from the various rooms are carried, and these are all fitted with Russell's atmospheric gas gill extractors for summer ventilation. The fresh-air inlet tubes are of cast-iron and to special design. The staff and patients' w.c.'s are also ventilated into a separate flue fitted with powerful extractor.

AN accident is reported to have occurred at Messrs. Ashton, Frost & Co.'s foundry, Blackburn. Men were engaged in hoisting a large iron plate in the drying-shed when the crane collapsed, and in falling dragged away the supports of the roof, which fell in. A large quantity of iron was stored on the roof,

and a number of men were buried under it, three of them being injured.

NOTICES have been given to the steel and tinplate workers at the Pontymister Works to terminate contracts on Saturday. The dispute has arisen through the Scotsmen and North of England workmen having refused to continue the work of rolling steel bars, and upwards of 1,000 workers are affected. Serious riots took place at these works two months ago, owing to a collision between the Scotsmen and Welshmen.

THE Barton Rural Sanitary Authority have accepted the tender of Mr. Robert Lomax for the execution of No. 1 and 3 sections of the Irlam and Cadishead main drainage works.

BUILDING AND BUILDERS.

STEPS are still being taken for the restoration of St. Michael's Church, Linlithgow. The church is one of the finest specimens of old ecclesiastical architecture now existing, and the desire for complete restoration has been felt for many years. A fund of something like 3,000*l.* has been provided by donations and subscriptions already.

THE report of Sir A. W. Blomfield, A.R.A., on the disaster to the chapter-house of Chester Cathedral in the gale of Sunday, the 11th ult., has been considered by the Dean and Chapter. They have decided to make safe the exquisite groining of the inner roof, which has been much shaken, and also to complete the western gable and roof, as the late Sir Gilbert Scott had advised. For this work it is hoped that 1,000*l.* will suffice, and as there is no fabric fund to meet such expenditure the Chapter will have to appeal to the generosity of the public.

THE post office at Carnarvon is to be considerably enlarged by the addition of the dwelling-house which forms a part of the building. The contract, which involves an outlay of several hundred pounds, has been let to Mr. Watkin Jones, Bangor.

THE present Stamford Workhouse has been condemned by the Local Government Board as inadequate and insecure. The Stamford Board of Guardians, at their fortnightly meeting, decided to defer the consideration of a new workhouse for six months. The matter has been before the board for three years. It was stated that the present house is very overcrowded.

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R. H., London, September, 1893."

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TELEPHONE 804.

OFFICES for the Keighley School Board have been erected in Cooke Street and Lawkholme Lane, Keighley, from the designs of Mr. J. Ledingham, F.R.I.B.A., of Bradford.

At the meeting of the Glasgow Dean of Guild Court, a letter was read from Mr. John Whyte, Master of Works, directing attention to the dangerous condition of many chimney-heads in the city, especially those on the front and back walls of tenements. A number of these were blown down by the late storm, and several persons were seriously injured, although fortunately no lives were lost. The Lord Dean suggested that proprietors and factors should carefully examine such chimney-heads, and in cases where there was no support it would be well to put an iron stay; or, better still, an iron ladder, which would be a convenience to sweeps, and would also prevent chimney-heads from being blown over.

VARIETIES.

THE Sheffield Trades Council have passed a resolution in favour of the Corporation subscribing 100,000*l.* towards the limited company which has been formed for the purpose of constructing a central railway and connecting lines in Sheffield, at an estimated cost of a million and a half. The erection of the new station would necessitate the clearing away of one of the most unsanitary districts of the city.

At a special meeting of the Severn and Wye Railway Company, it was unanimously decided to sell the line to the Midland and Great Western Companies for 477,000*l.*

JOHN OAKEY & SONS, Limited, have been able to declare a dividend of 10 per cent. on last year's business, which is a satisfactory testimony of good management.

A SUM of 1,000*l.* having been subscribed towards a memorial of the Bishop of Winchester's episcopate in the diocese of Rochester, it is proposed to devote the money to the erection of stalls, designed by the architect, Sir Arthur Blomfield, in harmony with the beautiful choir of the church of St. Saviour's, Southwark.

THE annual salary of Mr. A. R. Binnie, the chief engineer of the County Council, is at present 1,500*l.*, and on the recommendation of the general purposes committee the amount

will be increased to 2,000*l.* They also recommended that the salary of Mr. Shirley F. Murphy, the Council's medical officer of health, should be raised from 1,000*l.* to 1,250*l.* per annum.

A LOCAL GOVERNMENT BOARD inquiry has been held at South Wingfield to consider an application of the Belper rural sanitary authority for a provisional order for the compulsory purchase of 5 acres of land for waterworks purposes. Mr. W. H. Radford, C.E., of Nottingham, is the engineer to the scheme. It is proposed to take water from certain springs and brooks, and construct filter-beds and service reservoir, with the necessary iron mains to supply South Wingfield with water.

THE water committee of the Carlisle Corporation have agreed to recommend a gravitation water scheme for the city, at a cost of about 110,000*l.* At present Carlisle is supplied with water from the river Eden, collected in filter-beds on the Steney Holme, close to the town, and thence pumped to the consumers. The water is abundant in quantity and excellent in quality, but the pumping machinery, which has been in use for many years, is said to be worn out, and inadequate for modern requirements.

THE Parks Committee of the County Council propose to expend 6,000*l.* in laying out Hackney Marshes, and in constructing embankments, watercourses and bathing-pools.

GLENBURN Hydropathic establishment, built at a cost of 35,000*l.*, to replace the building destroyed by fire in 1891, has been reopened.

STEPS are being taken to build a new church at Rugeley in place of the old structure.

NEW CATALOGUE.

THE catalogue of Messrs. B. Ward & Co., of 15 Great George Street, Westminster, of patent fireproof floors, will interest many of our readers. The system is designed to secure fireproof floors that are also sound-proof, and in addition ventilated. Among the specialties referred to and illustrated are fireproof casings for columns, stanchions, &c.; damp-proof and sound-proof slabs for walls, concrete slabs for curing damp in basements, grooved and channelled granite concrete paving for stables, &c.; fireproof staircases, granite concrete flooring for buildings, &c., and general concrete work.

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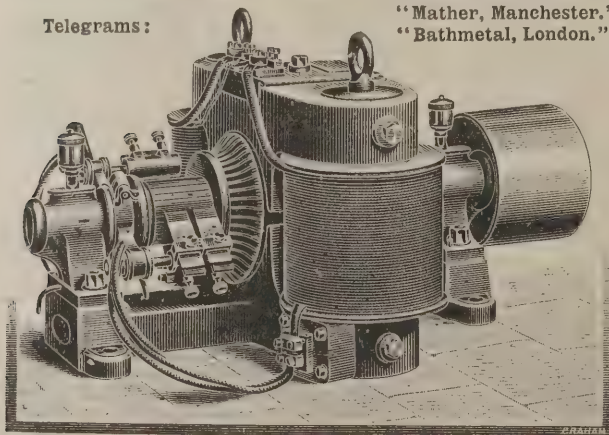
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PUMPING MACHINERY.

At the meeting of the Birmingham Mason College Engineering Society, under the presidency of Professor R. H. Smith, a paper was read by Mr. Edward C. R. Marks on "Pumping Machinery." The author fully traced the development of such machinery from ancient water-raising appliances, as employed for centuries prior to the introduction of the common suction

pump, to the most modern type of steam-pumping engine for waterworks service. The limit of suction lift was discussed, and details given of the power of men in pumping. The first application of steam for the purpose of pumping as applied by Savery for the Cornish mines was illustrated, as also the development of such application by Newcomen and Watt. Full details and particulars of tests were put forward concerning the Worthington pumping engine, from the smallest size, as employed for boiler feeding, to the largest types, in which, as was shown, when fitted with compensating cylinders, enabling the steam to be expanded to the utmost useful ratio, the duty obtained in actual pump energy amounted to upwards of 114 million foot-pounds per one hundredweight of coal, a result that fully equalled or surpassed anything obtained with crank and fly-wheel engines of the most refined type.

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THE number of members has again increased. The second quinquennial period has now closed, and the accounts will shortly be in the hands of the actuary. As compared with the close of the first five years the membership is as follows:—

	Dec. 31, 1888.	Dec. 31, 1893.
Sick Allowance Fund ...	33	71
Life Assurance ...	25	35
Superannuation ...	10	13
Benevolent... ..	7	5

During the past year three members have withdrawn from the Association and one has died. The important alteration made in the life assurance division has resulted in the issue of new policies and the increase of old policies to the amount of 800/. No claim has yet arisen in respect of this fund. The management expenses and the claims on the sick fund have again been nearly covered by the interest on investments. A further sum of 100/. has been added to the invested funds, raising the total amount to 2,800/. The committee mentioned in their report last year that they were endeavouring to raise an annuity fund for an aged member of the staff of a City firm. After careful inquiry they felt justified in voting 25 guineas from the Association Benevolent Fund, and with other generous subscriptions a total sum of 186/. was raised. The greater part of this was devoted to the purchase of an annuity. The Association is administering the balance for the benefit of the annuitant, but apart from the general funds.

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AN IRISH VETERINARY COLLEGE.

IT is announced that the Government will ask Parliament to authorise the grant of a sum of 15,000*l.* as a contribution towards the cost of acquiring suitable buildings and fittings for a Veterinary School of Medicine in Ireland. The college is to be under the control of a board of governors, one of whom shall be president and one treasurer. The governors shall be nominated in part by the Crown, in part by the Royal Dublin Society, the National Board of Education and the subscribers. From the governors shall be selected an executive committee under the name of "The General Purposes Committee," to whom will be entrusted the framing of by-laws for the government of the college and all matters relating thereto.

The college buildings will consist of:—1. An official residence for dean or resident veterinary officer. 2. Infirmary for sick animals. 3. Operation theatre. 4. Lecture-rooms. 5. Chemical, physiological and bacteriological laboratories. 6. Museum and library. 7. Dissecting-room. 8. Board or committee-room. 9. Professors' room. 10. Classroom for students.

IMPROVEMENTS IN EDINBURGH.

AN agreement is likely to be arrived at between the Corporation of Edinburgh and the North British Railway Company concerning the widening of the North Bridge and other improvements around the Waverley Station. The Lord Provost's committee consider an opportunity such as is not likely to occur again has now arisen for rebuilding and widening the North Bridge under favourable circumstances. These circumstances are—(1) That a large contribution in money and numerous valuable concessions in favour of the Corporation may now be obtained from the North British Railway Company; and (2) the company are about to proceed with the extension and reconstruction of the Waverley Station, and there are strong reasons of expediency for rebuilding the bridge concurrently with that work. The committee of the House of Commons unanimously expressed their strong opinion in favour of the bridge being rebuilt concurrently with the reconstruction of the station as being in the interests of both the Corporation and the Company, and the Corporation might be placed in an unfavourable light before Parliament if they disregarded such a recommendation. (3) If

the present opportunity is not taken, the Corporation will, on a future occasion, probably not remote, require to undertake the work at a very much greater cost than at the present time, and under difficulties and disadvantages which can now be avoided. Further, the public would probably suffer from an inconvenient station and a less efficient railway service. (4) To get the full advantage of a new and widened bridge it is necessary to carry on the widening all the way up to the High Street. This would effect a great public improvement, and can be done at a comparatively moderate cost. The company now offer the contribution of a fixed sum of 30,000*l.* towards the cost of the bridge. That is one-third of the total estimated cost, and is a large increase on the amount which they had first proposed.

Among the terms stipulated for by the North British Railway Company as the condition of leaving the site occupied by the buildings on the north-west corner of the North Bridge unbuilt on are:—(1) The company ask the Corporation to convey to them, free of charge, the space under the northern arches of the bridge, for which the Corporation at present get a rent of 125*l.* per annum. (2) They ask the Corporation to convey to them, free of charge, the following subjects, which might be taken under the compulsory powers of the Waverley Station Act, 1891, on payment of compensation, viz:—The fish market in Macdowell Street, extending to 1,200 square yards, with the buildings thereon; a piece of ground adjoining Regent Road, east of the Calton Prison, and opposite the gasworks, extending to 735 square yards; wayleave for tunnel at the east of Regent Road, extending to 565 square yards; a piece of ground at Regent Gardens, further east than the tunnel, extending to 990 square yards; a piece of ground at the corner of Cranston Street, 340 square yards; and the area of certain streets, which would be closed. The company also ask the Corporation's consent to Parliamentary sanction being given to certain relaxations of restrictions and servitudes affecting the station. It likewise appears that the company ask to be relieved of the obligation, before stopping up Cranston Street, "to construct and thereafter to maintain and light a subway for foot passengers at that street;" and they further ask the Corporation to discharge certain claims without payment, including claim for the temporary occupation of certain ground in East Princes Street Gardens; claim under the Act of 1891 for the expense of screening and planting the railway in Princes Street Gardens; and claim for wayleave for tunnel under Torphichen Street Police Station, if the Corporation agree to grant wayleave.

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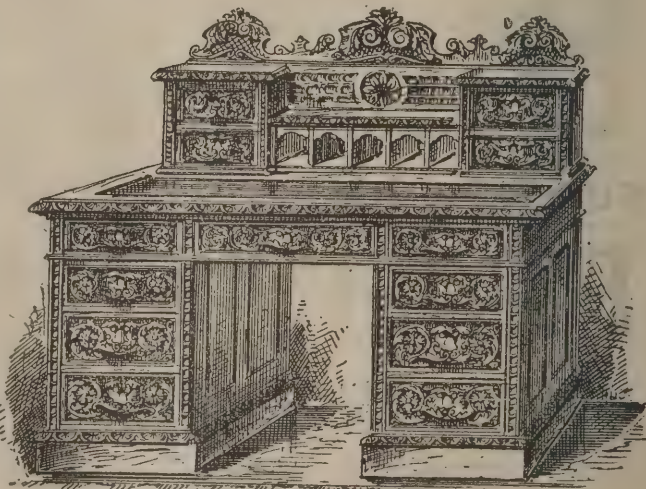
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PORTSMOUTH DOCKS.

ALTHOUGH the excavation of the new docks, Nos. 14 and 15, at Portsmouth has been resumed, the work is making only slow progress, being confined to the heads, in consequence of the inflow of water from the repairing basin through the open entrance of No. 15. The entrances were constructed at the same time as the extension works, and are identical with the entrance to No. 13, with the exception that, owing to the satisfactory nature of the ground, the piling in the foundations has been omitted, the sheet piling in front only being retained. The entrance to No. 14 is closed by a caisson, and until the other entrance has been similarly blocked, the excavations cannot make much headway. As originally designed, the distance between Nos. 14 and 15 was 210 feet, and the new docks were intended to be of the same size and description as No. 13. It is now proposed to increase their length to 600 feet, but without making any practical increase in their breadth. The estimated cost of the two new docks is 310,000/.

WINTER GARDENS PAVILION, BIRMINGHAM.

THE Winter Gardens Pavilion, abutting on the Old Square, Birmingham, was reduced to ruins on Sunday night by the violence of the wind, which had been increasing in force from sundown, and became very boisterous between nine and ten o'clock. The pavilion, which was constructed mainly of glass, wood and corrugated iron was in course of demolition, the materials having been sold to a local contractor in order that the site might be cleared preparatory to the erection of extensive business premises by a wholesale drapery firm. A number of sheets of corrugated iron forming portions of the roof and sides of the building had been removed, and this circumstance was no doubt accountable for the disaster of last night, the wind thus admitted exercising immense force on the hollow structure which remained. At about twenty minutes past nine,

says the *Birmingham Post*, there was a terrible crash as the sides gave way and the roof collapsed, and the greatest alarm was created in the neighbourhood, the thunder of the falling timbers being heard for a considerable distance. It was at first feared that the caretaker of the building was buried in the ruins, as he had been seen to go in at the main entrance shortly before the catastrophe. After a moment of suspense, however, he emerged into the Old Square, having happily been warned of the approaching danger just in time to enable him to effect his escape. The scene was one of utter chaos, all the supports of the building having given way, and let down the glass and iron roof bodily. Fortunately everything had been cleared out of the interior, but the damage to the material of which the structure was composed must be considerable. In view of this untimely dissolution of what was till quite recently a popular resort of pleasure-seekers, it may not be uninteresting to recall some of the vicissitudes through which it has passed during its brief but chequered history. The iron pavilion known as the Winter Gardens was opened on Boxing Day in 1890. It was intended as the forerunner of a permanent structure on the plot of ground leased from the Corporation by the Winter Gardens and Hotel Company. The company, however, did not receive the support that was anticipated for it, and the Winter Gardens portion of the scheme was indefinitely postponed, while the adjoining block, consisting of an hotel and shops, had to be completed on a less ambitious plan than that originally proposed. Efforts were made to promote the popularity of the pavilion by means of promenade concerts and industrial trade exhibitions, but these attempts, however, only met with partial and passing success, and the company were glad to let the place for a skating-rink. During this phase of its history Sunday evening promenade concerts were given, and a somewhat ludicrous attempt was made to protect these against the provisions of the Lord's Day Act by combining with them a short address, and so investing the concerts with the character of a religious gathering. A preacher was advertised for, but no one responded to the invitation, and the manager had to mount the rostrum himself. These and other ingenious enterprises failed to make the rink a success. A much more ambitious scheme was that of "Venice in Birmingham." The conversion of the pavilion into a miniature Venice, with canal, gondolas and other characteristic adjuncts, made the Winter Gardens, with the aid of a series of concerts and conjuring and other entertainments, a very popular resort for some time. Eventually, however, the place was dismantled,

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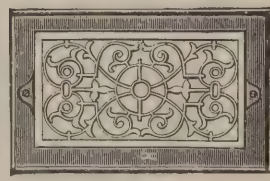
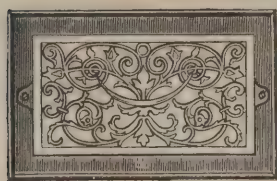
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and for some time past it has been in the hands of the Corporation, who, as the ground landlords, found it necessary to resume possession of the site and take over the buildings. During the gale of a fortnight ago a portion of the building had to be removed by the Fire Brigade for the safety of the public.

BUILDING LINES IN MIDDLESBROUGH.

A SUMMONS was taken out by the Middlesbrough Town Council against Mr. J. S. Scott, builder, for disregarding the third section of the Public Health Act, 1888, when erecting buildings on his own land. The case was heard by the stipendiary, Mr. C. J. Coleman. The Town Clerk stated that Mr. Scott was the owner of a plot of land which had a frontage to Linthorpe Road of 100 feet, to Southfield Road of 154 feet and to Wilton Street of 100 feet, and the plot contained 1,752 square yards. On this plot were three wooden structures—one occupied as a cobbler's shop, one as a fancy goods and tobacconist's shop, and one as a confectioner and tobacconist's shop. The first-named of those structures, he understood, was built in 1874, but that was contrary to the information given to him when the summons was issued, and as it could not, therefore, be affected by the Act, he asked the Court to allow him to withdraw that summons. The other two buildings were erected in 1891 and in October, 1893. The Urban Sanitary Authority claimed the right to require all buildings situate in Southfield Road on the south side up to Palmerston Terrace to be set back 70 feet, and that all buildings on that portion of the east side of Linthorpe Road to be set back 30 feet. If these set-back lines were carried out it would reduce Mr. Scott's plot for building purposes to 404 square yards; but he submitted that Mr. Scott became owner and took possession of the land with a full knowledge of the requirements of the Urban Authority as to set-back.

Mr. Parrington contended that a very great hardship would be done to Mr. Scott if the Corporation were allowed to enforce this set-back. There was no proof or allegation that their maintaining those buildings was any detriment to the public health, and the only other question he could conceive was the question of uniformity. He submitted that there had been no uniformity with regard to the line of buildings in Linthorpe Road, and he was driven to the conclusion that the Corporation were acting in an arbitrary and capricious manner towards Mr.

Scott. If the Corporation wanted the defendant to alter and set back those buildings they must compensate him, and the question of compensation was clearly provided for by the Public Health Act. He hoped his worship was not going to allow the Corporation to take away 1,300 yards of Mr. Scott's land without compensation. In conclusion, he pointed out that the Corporation had all along been receiving their rates until December 1893.

Mr. Bainbridge, in reply, said the Corporation were bound by the poor-rate book to rate those places. As to dealing with houses built at different distances, and having different set-back lines, the Corporation had no power to deal with those houses until the Act of 1888 was passed.

The Stipendiary said it was an important case, and he would take time to consider his decision.

THE TEMPLE OF PHILÆ.

"A CIVIL ENGINEER," writing to the *Times*, says:—Will you allow me to give some reasons for supposing that the resolution passed on Friday last by the Society for the Preservation of the Monuments of Ancient Egypt is founded upon incorrect or insufficient information and their fears are groundless, because it is possible that the alarm excited by the supposed destruction of the Philæ temples may raise opposition to the Assouan Reservoir, which is otherwise admitted to be the best possible irrigation scheme for Egypt?

The resolution assumes, without evidence, that if Philæ is submerged for some months each year the celebrated temples, which are unique for beauty and of the highest historic evidence, will be destroyed.

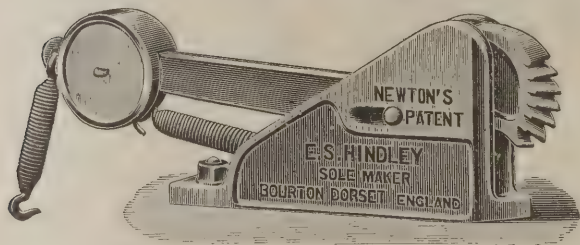
It is well known that the temples in themselves are not remarkable, either from an architectural or archaeological standpoint.

They are late Ptolemaic copies of an earlier style, and their unique beauty, as seen in the distance on the lovely Osiris Isle, depends mainly on the site and its surroundings. It is undoubtedly the most beautiful spot in Egypt; it seems more like the creation of a painter's fancy than an actual scene.

It is only when landing on the island that the beauty vanishes; we are disillusioned and disappointed to find that the whole island, including the avenues, colonnades and court-yards of the temples, has been covered with filthy mud-built dwellings of the later Coptic Christians, which not only dis-

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figure the place and hide the beauties of the temples, but make exploration difficult and tedious.

The temples themselves are so solidly built out of cut granite, face to face, with little mortar, on solid rock foundation, that were the whole island to be submerged for some months every year they would not be injured in the slightest degree. Quite otherwise, the water would dissolve, level, and partly carry away the mud hovels that now disfigure the place, and which would have been removed long ago could money have been found to pay for the labour.

It might reasonably be supposed that the action of the Nile water would wear away the finely-cut stonework in the temples, but any apprehensions on this score will be removed by examining the stone walls that protect the island while they are exposed to the full current of High Nile. Although they have been washed annually with the rising waters for about two thousand years, the stonework still shows the marks of the masons' tools and, in fact, looks so fresh that one might suppose that the wall had been recently built.

This being so, it is fair to suppose that the temples would suffer no more. In my opinion, the island would be greatly improved in cleanliness and beauty, and during the winter months the arid, dusty waste of crumbling mud-dwellings which now exist would be replaced by a beautiful garden, and parts of the temples that for want of funds cannot now be excavated might then see the light.

The island would be submerged during the months from May to September. The number of unofficial Europeans who travel up the Nile past Philæ at this period do not average one per month. Their loss would be compensated by the fact that during the tourist period the island would appear clothed with verdure, and far more beautiful than it does to-day.

It seems to me, therefore, that these frequent petitions about the island of Philæ are a "much ado about nothing." I would suggest that the Society for the Preservation of Monuments waive their objections to this scheme, provided that due care is taken to protect the temples, and that the island is laid out as a public garden.

Possibly they might get some *quid pro quo*, such as a larger grant for the preservation of ancient monuments, so that the necessary works for preserving the Karnak Temple and the tombs near the big pyramid and those of Sakkara may be carried out and maintained with efficiency.

Cordially as I sympathise in the main with the views of the

Society for Preserving Ancient Monuments, I think I have shown some reasons for differing with them about Philæ, the sacred isle "where the god sleeps" "whom it is not permitted to name," and whose attribute has ever been that he supplies Egypt with life-giving streams of pure water. A propitious omen.

Mr. W. J. Loftie in commenting on the above letter says :— There are no granite buildings on the island of Philæ, and an annual submergence would probably in about three years wipe out the two temples and the very interesting and curious early Christian remains at present scattered over the whole island. There is one point of some importance which I have not seen mentioned. The rocky islets in the Cataract, and especially those close to Philæ, are inscribed with hieroglyphics relating to kings of dynasties as early as the eleventh, while on the adjacent shore north of Mahatta a long valley is simply filled with similar inscriptions dating from the twelfth dynasty to the nineteenth. All these would, of course, be submerged, and after a season or two would, no doubt, be obliterated. Most Egyptologists, I think, are more anxious about Sehayl and Konosso and the writing in the quarries than about Philæ itself, and students of Christian antiquities think of the scarcely-explored remains of perhaps half a dozen Christian chapels, dating back to the second and third centuries of our era.

THE BUDA-PESTH TRAMWAYS.

THE electric lines in Buda-Pesth have been built and equipped by Messrs. Siemens & Halske during the past five years, along four of the principal tramway routes of the city. So far as the street surface is concerned, they do not show any striking difference from ordinary street tramways operated by horses. There are no poles or span wires across the streets, from which the electric conductors are hung in the "trolley" system, nor is there a third rail or a third grooved slot. There are simply two rails for each track, upon which run the car-wheels as on ordinary lines, and these are not employed in any way as part of the electric circuit for conveying current. The latter travels to and from the motor-cars along conductors in an underground conduit or channel made of concrete, and carried underneath the whole length of one rail of the track, The interior of the conduit is egg-shaped, 13 inches high and 11 inches wide in the clear. At distances of 1·2 mètres apart

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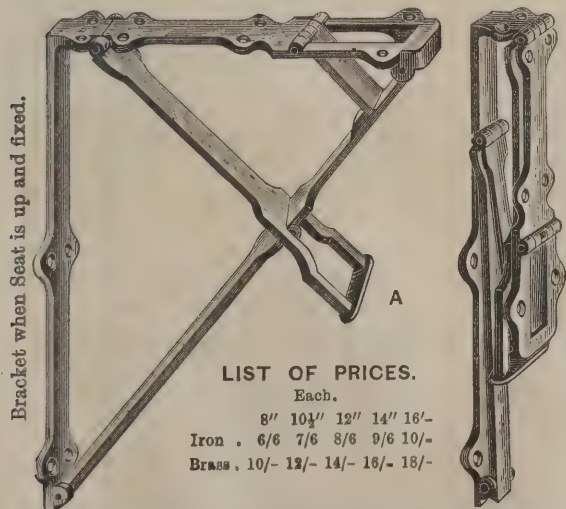
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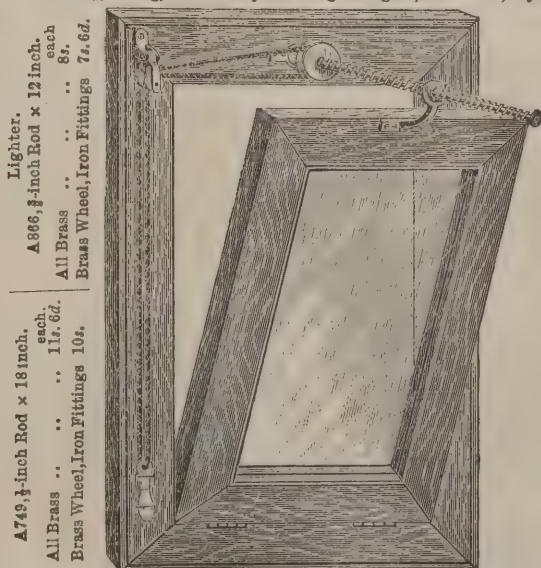
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(say 3 feet 10 inches) cast-iron frames of square shape are embedded crossways in the concrete. These frames have ribs or flanges 7 inches broad of a profile similar to the concrete channel, and they serve not only to strengthen the latter, but also as supports for the rails. The conductors, along which passes the current for the cars, are fastened to these flanges through the medium of suitable insulators. The bottom of the interior channel is about 2½ inches below the level of rails. The width of slot or distance between the rails—for access to the conduit channel and conductors—measures 15-16 inch. This width has been chosen so as to allow the flanges of the wheels to pass easily around curves, and is the same as that used in ordinary rails. If the electrical connection only had to be considered, this width could have been materially reduced. The current conductors of angle iron are led along the sides of the conduit channel, being fastened, as already stated, to hollow insulators; one conductor serves as the lead, the other as the return. They both lie directly underneath the rails, and, therefore, cannot be seen or touched from above; and they are fixed sufficiently high above the channel bed to prevent contact with any water that may drain through or lie in the channel. Sumps are provided at intervals to collect and retain such water and mud as may find access to the conduit, the overflow passing into the street sewers. There is no difficulty about this, nor any danger of water backing up from the sewers, as the base of the channel foundation does not exceed at any point a total depth of more than about 2 feet 4 inches from rail and street level. The second rail of each track might, of course, be of any desired section, since there is no conductor or conduit underneath. For instance, a flat rail could be used, and in such a case each track would have but one groove in the street surface, an undoubted advantage.

The cars do not outwardly present any different aspect to that of any ordinary street railway car; they have no draw-bar arrangement at the ends, but on the top of each under-frame sill is a buffer, which also serves to carry a coupling to allow of a trail car being attached. The car motor is placed in a closed casing between the two car axles; a system of double chain-gear is employed to reduce the speed ratio, driving on to one of the car angles from the motor spindle. The line potential is maintained at a pressure of 300 volts, and contact is made with the angle-iron conductors in the underground channel by means of a travelling contact piece attached to each car. A number of cars are able to run upon the same track independently of one another, and in different directions.

The entire network of lines is operated by current supplied from a generating station situated almost centrally. In the boiler-house are erected five water-tube boilers, each having a heating-surface of some 325 square feet. Of these, three are in regular use, leaving one to act as a reserve, whilst the fifth is being cleaned and repaired. The engine-room contains three 100 horse-power steam-engines, each of which drives a dynamo of corresponding output by means of hemp ropes, and three 200 horse-power steam-engines coupled up direct to large dynamos of ring type. These latter sets have been added lately in view of the increase of traffic. Current from dynamos is taken to a main switchboard, and thence distributed by separate armoured cables (simply laid in the ground) to four points in the network of lines; distribution boxes are provided at each point, whence short lengths of cable connect to the line conductors. At times of light load, part of the current from the dynamos passes into a battery of accumulator cells employed to light the offices, engine-room, boiler-house and yards; and when the generating plant is closed down for the night the same battery is also used for sending current (along the line conductors) to feed arc and glow lamps at the two suburban depôts while washing down or repairing the cars. On the lines are employed sixty-three motor cars, eight trail cars, and nine large cars for the Freidhof steam line. The maximum speed is 9½ miles an hour; but a little more than this, about 11 miles, is reached in the suburban districts. On the narrower streets near the centre of the city it is reduced to 6 miles; and at the crossings of important thoroughfares not more than 4 miles an hour is allowed. In consequence of the greater speeds thus attainable on the electric lines, as compared with horse cars, a very much larger daily car mileage can be kept up, with, of course, corresponding profits. Each car averages a run of from 75 to 100 miles per day of sixteen hours.

A complete system of private telephone lines is erected in connection with the tramway network, joining up the extremities with the supply station, which acts in this instance also as a central exchange. Within the city limits the telephone conductors are carried in an inductionless cable alongside and in the same underground trough as the cable supplying current to the line, but outside the city, where overhead wires are not so objectionable, the ordinary poles and light wires are used. Taken as a whole, the Buda-Pesth lines are unique in being the only tramway system or network now in active operation with any appearance of success employing underground line conductors.

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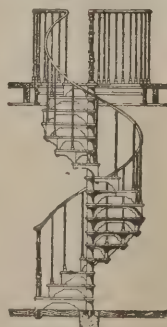
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COLD-AIR STORES, MANCHESTER.

A MEMORIAL tablet has just been fixed by the Lord Mayor of Manchester for the extensive cold-air stores in the course of erection in Water Street. The plans in accordance with which the work is being carried out were adopted after long deliberation and many visits to towns in which such works are already in operation. It is believed, the *Manchester Guardian* says, that when finished the stores will have no equal in the kingdom for completeness and efficiency. At the present rate of progress they will probably be completed by the end of the year. They are expected to cost about 100,000*l*. The engineer is Mr. Maunsell C. Bannister, and the contractors are Messrs. Robert Neill & Sons.

Mr. Roberts said that before presenting the Lord Mayor with a trowel and mallet for the purpose of fixing the stone, he desired to make a statement with reference to the interesting occasion which had called them together. The stores, he proceeded to explain, had been designed and constructed for the purpose of meeting an important want in connection with the markets adjoining and the other markets in the city, and had also been designed and the site selected as most convenient for the purpose of accommodating the ever-increasing importations of frozen and other perishable goods, and to provide accommodation for such goods coming from our colonies and from North and South America to Manchester *via* the Manchester Ship Canal. The site was eminently suitable for the following reasons. It was within a quarter of an hour of the Pomona docks, both by water and road; it was within easy reach of most of the principal markets of Manchester and Salford, and within a few minutes of the principal railway depôts, from which in the near future direct railway communication might possibly be established. The store was in the midst of an extensive beef, sheep, pig and cattle market, well known to the trade as the Elm Street and Water Street Markets and Abattoirs. From these markets and abattoirs there would be direct tramway communication into the cold-storage buildings, and specially-constructed trams would collect all material required to be stored, and return the same into the markets out of the store as required. The stores consisted of a substantial square block of brick buildings, about 130 feet long by 120 feet wide and 75 feet high from the basement floor, with provision for extension upwards should trade requirements demand it. They contained a basement, a ground

floor and three upper floors. The basement was arranged for the purpose of accommodating goods of a wet or moist nature, and was so constructed that the sanitary arrangements were as nearly perfect as possible. The chambers could be thoroughly washed out when required, and cleansed periodically after each parcel of goods had been stored or removed. It was intended to store in the basement fresh offal from the markets—hides, bacon, fish of every description, and other goods of a similar nature. The basement contained a spacious central corridor, from which entrance would be obtained to the storage chambers at each side. Any of the basement stores, if occasion required, might be used for frozen goods. The ground floor was set apart as being most convenient for dealing with the more heavy material, such as fresh and chilled sides and quarters of beef, which would require to be dealt with during the summer months. Accommodation would be provided for chilling 1,200 sides of beef in twenty-four hours. The meat would be carried to these chill-rooms by means of specially constructed tramways and trucks, so arranged that the sides would be carried in a vertical position and then transferred to the overhead rails and runners communicating with the storage chambers, of which there were six. Weighing machines, lifting gear and other necessities for accommodating the trade in the most efficient manner possible would be provided. These chambers might be used as a market, in which the material could be sold or otherwise disposed of in store, if the trade so required it. On each side of the chill-rooms a large roadway was provided, one on the outside of the building in communication with the overhead rails and runners, and the other right through the premises under cover, where goods would be removed from the chambers as required and weighed on overhead weighing-machines and then placed on carts or trucks as required. On the other side of the covered roadway there would be the steam boilers and refrigerating machinery, as well as extensive electric-lighting engines and dynamos for lighting and at the same time driving and circulating the air through the building. The first, second and third floors would contain the chambers for specially dealing with the higher classes of goods which required freezing temperatures, although any chamber on these floors might be raised to above the freezing temperature when necessary. The stores were practically constructed and arranged so that the greatest despatch might take place both in delivering and receiving goods, and for that purpose a gallery was provided through the stores, each side of which communicated with the chambers.

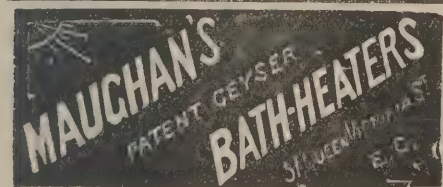


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There would be four large chambers on each floor, besides provision in the gallery for storing and drying material before storing. Arrangements of this description would enable all the doors communicating with the gallery to be left open during working hours, so that every facility for ingress and egress to and from the chambers was provided. Each floor would contain a gallery on the north and south of the building, with office accommodation for the staff employed on the premises, as well as for any customers who might have permanent storage accommodation. The first, second and third floors would each accommodate about 20,000 to 25,000 carcasses of sheep or other similar goods. The arrangements for communicating with the various upper floors from the roadway and from the barges to and from the Manchester Ship Canal docks would be as follow:—There will be four hydraulic lifts, two on the north end and two on the south end of the building. From the covered cartway through the premises large receiving stages would be constructed in connection with these lifts, and material would be quickly disposed of from the carts on to specially-constructed trucks. These trucks would be run on to the lifts direct, and sent up or down to any floor as required. It was estimated, from the practical working of similar installations, that at least 4,000 sheep per hour could be delivered on to the stages and removed to any floor of the premises. Besides these four lifts there would also be provided three hydraulic sheep elevators. Each of these elevators was calculated to lift at least 600 sheep per hour, and to discharge the same automatically either from the roadway or from barges directly into the stores on any floor, or to receive goods from the stores and to take them down for removal by cart or otherwise. It would thus be seen that when the four lifts and three elevators were working from 5,000 to 6,000 sheep would be received or delivered per hour. This was considerably in advance of the capabilities of any other store either in London or elsewhere, and the rapidity of manipulating goods stored would be greatly appreciated by the trade. The principal features in connection with this store were that in no chamber or room would there be any machinery whatever, and no snow, fog or damp; that each chamber in the building might be regulated to any degree of refrigeration required, that all superfluous moisture would be rapidly removed from the stores and from the material that was being stored; that the whole of the air contained in each chamber throughout the building would be constantly removed, cleansed, purified and cooled. The entire building will be

lighted by incandescent electric lights, and all conveniences for the trade would be provided in the way of hangers, hooks, trays, trucks and hand luries, with a number of large platform and other weighing-machines on each floor. The machinery, which would be in duplicate, was of the highest class of make and design, and had many new and important features not at present in use in any other store. The plant consisted of two triple expansion vertical marine engines, each driving direct two fifty-ton Linde compressors. Each engine and two compressors would be capable of refrigerating the whole of the chambers in the entire building to any reasonable temperature required, as well as chilling 1,200 sides of beef in twenty-four hours. It was claimed by the makers of the machinery that no part or portion of the apparatus rose at any time more than a few degrees above the normal temperature of the condensing water, and further, that the cold air in circulation would be as pure and dry as that of an Arctic winter. Three Babcock & Wilcox boilers would supply the necessary steam for working the steam-engines. Any two of the boilers could work both refrigerating machines simultaneously, as well as two powerful electric plants driven by special steam-engines, one for the purpose of driving and circulating the air through the chambers, and the other for lighting the premises. The motors driven off the dynamos in the engine-room for driving the circulating fans would be entirely under the control of the engineer in the engine-room. It would thus be seen that there could be no possible apprehension on the part of the trade regarding a breakdown. The temperature of the whole of the stores would be under the control of the engineer in the engine-room, and electric indicators would be fitted in the manager's office to indicate the temperature of each of the various chambers. The cost of these buildings, equipped with all machinery, electric plant, lifts, hangers, &c., as per contract, amounted to from 90,000*l.* to 100,000*l.* This included the extension of the dead meat market, and additional slaughter-houses and lairs.

SANDOWN CASTLE.

THE demolition of a portion of Sandown Castle at North Deal is in progress. The work is being carried out by a party of the Royal Engineers from Shorncliffe, under the direction of Major Kenney. Gun-cotton is the explosive used, and it is fired by electricity. The castle was one of several built by Henry VIII. for the protection of that part of the coast. For many years

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the sea has been encroaching upon the point of land where Sandown Castle stands. For years past the tide has regularly flowed into the interior of the castle. The seaward portions of the structure were considered unsafe to the public by whom the ruins were visited, and the War Office therefore decided to demolish them. In the course of the operations two persons have been struck by missiles and slightly injured.

PRIMITIVE WELSH DWELLINGS.

MUCH interest has at all times been taken in the dwellings of the ancient Welsh. This feeling has been made keener of late by the interesting letters which have appeared from time to time in the columns of the *Western Mail*, and the evidence furnished by Mr. Ivor James to the Cardiff Naturalists' Society in his paper. It was in August of 1892 that Mr. James visited Penygedr Fawr, the highest peak of the Black Mountains, some miles from Abergavenny and Crickhowell, and more than 2,000 feet above the level of the sea. At a spot called Pentwyn Mawr Mr. James came accidentally across a kind of dry ditch. There were some signs of quarrying about. He followed this dry ditch until he found himself standing in front of a large hole which formed an entrance into the very heart of the mountain at the highest point of the ridge. Striking a match Mr. James cautiously descended through a passage some three or four paces in length into a perfectly dark, slightly domed chamber, not quite circular nor yet perfectly square, fitted on one side at least with seats formed of stone slabs.

It was a singular sensation to find himself in the interior of the mountain, and Mr. James's thoughts naturally flew back to the fairies and brownies, to Puck, and the rest of the legendary train, nor did he forget the remark of Malone that Shakespeare perhaps picked up Puck in Cwm-Pwca, near Tretower, among these very mountains, "pooky" in Welsh signifying a goblin. A more prosaic view suggested that the chamber was a mere shelter for shepherds or quarrymen; but of one thing he was certain, that it was in no sense of the word a natural cave, and that the roof was quite on a level with the ground, and visible only on close inspection. It was not possible at the time to make any accurate measurements of the chamber.

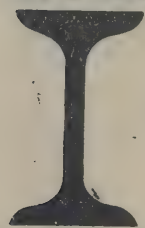
In the neighbouring hills Mr. James subsequently discovered a number of shallow circular depressions, which he ascertained were to be found in great numbers elsewhere on the high land round Llanthony, and so on. On Bryn Arw,

near Llanvihangel, these depressions are to be numbered by hundreds, and Dr. Bull, of Hereford, had given them the name of hut circles. Some of the Bryn Arw circles were 5 or 6 feet in depth. It was very strange that these circles were marked on no map, and had received little or no attention from travellers or tourists. The bulk of the people whom Mr. James questioned had never seen or heard of the circles, but one man said they were ponds to serve the mountain sheep with water, another that they were shelters for sheep in winter, and a third that they were pits for burning charcoal. The pits were usually found in clusters, and Mr. James argued that both the pond and shelter theories were untenable, nor was there any trace of charcoal-burning about them.

At a later period Mr. James returned to the neighbourhood of the circles, accompanied by several naturalists. On the way up the hill, near the summit, Mr. T. H. Thomas called attention to some dry walling. On the heights above, the circles were found in great numbers, and were examined and discussed with great interest and care. Mr. Robinson thought the depressions were due to the action of water, but this was stated to be improbable by geologists whom Mr. James had consulted. Mr. T. H. Thomas thought the depression might have been made by quarrymen in search for stones, which idea was somewhat supported by local tradition, but the great number of the circles was a great objection to this, for it was scarcely conceivable that any seekers would uncover a great proportion of the mountain top in search for building and roofing stones, which might be obtained with much less trouble nearer their homes and work. There was a general opinion among the party that the circles of Bryn Arw were the work of man, and that they were very much like the hut circles found in other parts of the kingdom. Incidentally it might be mentioned that the name Bryn Arw (rough hill) was probably given the hill in remote, possibly prehistoric times; but there is nothing rough about Bryn Arw save these very depressions. Unfortunately the party were unable to visit the chamber first mentioned, nor had Mr. James been able, as he hoped, to secure photographs of its interior. There was (remarked Mr. James) no necessary connection between the chamber and the depressions, and with the origin of the latter the lecturer proceeded more particularly to deal.

Assuming that the theory of their being hut circles was correct, and that they were the foundations of human dwellings, the question arises, What induced the inhabitants of these parts to prefer the barren hills to the rich plains and valleys of

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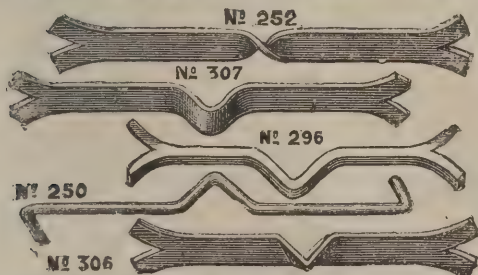


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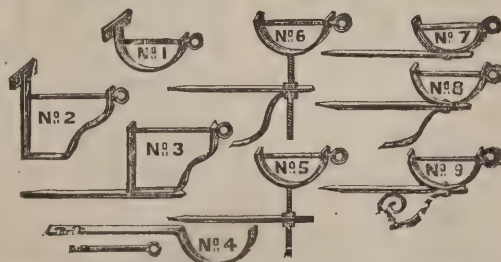


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Hereford and Monmouth? Could anything like them be found elsewhere? Answering this question at some length, Mr. James drew attention to the gipsy encampment of our day, with its invariable circle; to the hut circles at Weston, where bones, flints and the like were discovered; to the dwellings of the Aleutians, Shushwap Indians, Greenlanders, &c. Might not these be the modern type of the ancient huts of Bryn Arw, the ancient dwellings of the Britons, and might not also certain old pigstyes at Machen and Llantrithyd be survivals pointing in the same direction? But granted that the circles were the remains of ancient huts, who built them, and when and why were they erected on these mountains? The reply to these questions involved an interesting historic disquisition, in the course of which Mr. James referred to the brave and determined stand made by the Silures against the onward march of the Romans, whose efforts were taxed to the utmost to retain possession of the country. The settlements of the Romans were in the plains and valleys; the natives were driven to their mountain fastnesses. After the Romans came the Saxons and the Normans, and Mr. James Davies and Mr. Bevan had prepared a map showing the respective remains, which, for the district it covered, gave the following figures:—British 13, Roman 3, Saxon 3, Norman 23. At Brampton Ryan we have a Norman castle, an Anglo-Saxon castle, a Roman camp and a British camp lying close together, a fact very suggestive of the endless conflicts which occurred in the locality.

It has been said by a competent Welsh writer that during 400 years, between the departure of the Romans and the Norman Conquest, there was scarcely a square foot of the country which had not been stained with human blood. Now all these Roman, Saxon and Norman fortifications were erected at the base of the Welsh mountains, a fact significant of the real state of the case. There was independent proof that the Welsh had been driven, as a last extremity, to the mountains, yet there was not on those mountain spurs a house, a cottage, or even a wall. Where, then, did the "wild Welsh" live? Did not these facts in themselves form presumptive proof that the circles were the sites of British villages, first formed, it might be, in neolithic times, and repaired as occasion required from age to age and century to century? They may yet be proved to have been the cities of refuge to which the Welsh fled during successive invasions. In conclusion, Mr. James suggested that the work of excavation, by way of throwing further light on the origin of the hut circles, might profitably be undertaken by the Cardiff Naturalists' Society.

REGISTRATION OF PLUMBERS.

THE annual public meeting in connection with the Bradford District Council for the National Registration of Plumbers took place at the Bradford Technical College on Thursday, March 1. The chair was occupied by Mr. Charles France, architect, and the following gentlemen took part in the proceedings:—Dr. Rabagliati, Dr. Harry Meade, Dr. Evans (medical officer), Mr. W. T. McGowen (town clerk), Mr. Jas. Watson (waterworks engineer), Mr. J. H. Cox (borough surveyor), Dr. Ainley (medical officer of Halifax), Mr. Keighley Watson (town clerk of Halifax), Councillor Wade (Halifax) and others. A deputation from the Worshipful Company of Plumbers, London, also attended the meeting.

The United Trades' Council, at its meeting at Dublin, passed the following resolution:—"That we consider the recommendation of the public health committee as to the appointment of two plumbers as sanitary inspectors should be supported by all the members of the Corporation, seeing that it will not be any extra cost on the ratepayers, and also that the citizens will get the benefit of skilled men instead of the incompetent parties at present employed."

At the meeting of the Court of the Plumbers' Company at the Guildhall the following ten operative plumbers were admitted to the honorary freedom of the Company, having passed the City and Guilds of London Institutes' examination in the theory and practice of sanitary plumbing first class in the honours grade:—Arthur Britton, of Leeds; Harry Callow, of Brixton; William Carl, of Bristol; Peter John Chaplin, of Battersea; John Frederick Cutty, of Bristol; Chas. Woodville Dyke, of Liverpool; David Early, of Sydenham; Thomas Briggs Hunter, of Windsor; James Joseph Lyon, of Liverpool; Henry Wallace McClellan, of Lambeth.

LIST OF REGISTERED PLUMBERS.

London Journeymen.

GROVES, J. E., 101 County Terrace, New Kent Road, S.E.
LOVELL, A., 9 Tournay Road, Fulham, S.W.
MARSH, W., 4 Claybrook Terrace, Hammersmith, S.W.
STRETTON, W., 180 Park Villas, Kilburn Park Road, Paddington.

Provincial Masters.

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Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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DICKIE, W., Hyndland Road, Maryhill, Glasgow.
FERNIE, D., 91 South Quay, Ayr.
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GOLDIE, J., Enniscorthy, co. Wexford.
HUTCHINSON, B., Carlow, Ireland.
JACK, D. B., Tighnabruaich, Argyllshire.
JONES, I., School Hill, Bolton.
LOVE, J. D., 19 High Street, Johnstone, N.B.
LOW, A., 15 Maxwell Street, Partick, Glasgow.
LOW, I., jun., 60 Weaver Street, Glasgow.
MCDAVID, W., Kimberley House, West Bay, Millport, N.B.
MCFARLANE, J., 184 Eglinton Street, Glasgow.
MCNAMARA, C., 10 Christchurch Place, Dublin.
MACKINNON, W. C., 150 James Street, Bridgeton Cross, Glasgow.
MACPHERSON, A., Main Street, Newmilns, N.B.
MORRISON, A., Flora Villa, Bridge of Allan, N.B.
PARKINSON, E., 30 Cannon Street, Manchester.
REID, J., Stewart Street, Kirn, N.B.
RING, J., 48 Lower George Street, Kingstown, Dublin.
SCOTT, W. J., Perry Street, Dungannon, Ireland.
SMILLIE, J., 45 Watt Street, Glasgow.
SMITH, A., 138 Allison Street, Govanhill, Glasgow.
TAYLOR, A., Chapel Street, Hamilton, N.B.
THOMSON, W., 55 Copeland Street, Govan, Glasgow.
TODD, T. B., Main Street, Newmilns, N.B.
TWADDLE, J. R., 179 Gallowgate, Glasgow.
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WHITESIDE, J. F., 18 Castle Gate, Clitherhoe, Lancs.
WILSON, D. M., 22 Scott's Lane, Port Glasgow.

Provincial Journeymen.

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BAIRD, T., 27 Lower Abbey Street, Dublin.
BEATTIE, T. G., 16 Joy Street, Belfast.
BERNARD, E. L., 85 Victoria Street, Northwood, Hanley.
BEVERS, J. W., 9 Outcote Bank, Huddersfield.
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BOWIE, A., 21 Raymond Street, South Circular Road, Dublin.
BRADSHAW, T., 323 Bolton Road, Pendlebury, Manchester.

BROCK, H., 52 Dundas Street, Grangemouth, N.B.
BROWN, H., Bridgend, Cheyston, Kirkintilloch, N.B.
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FORBES, P., 23 Lower Oriel Street, Dublin.
GALLIE, C., Hillside, Skelmorlie, N.B.
GLOVER, J., 31 Pleasant Street, Dublin.
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KELLY, J., 3 Beresford Place, Dublin.
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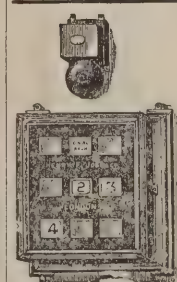
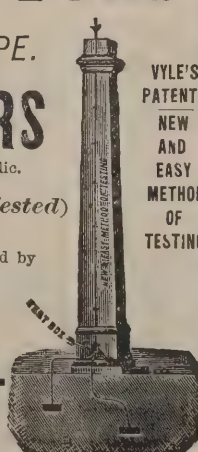
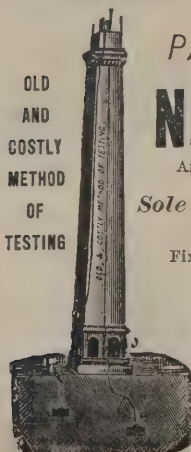
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 GIBSON, R., Cape Town, South Africa.
 SCOTT, J., Dunedin, New Zealand.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3029. Ernest Collins Chard, for "Improved indicating and registering mechanism for attachment to weighing scales."
 3033. James Beecroft and Albert Shiner, for "The secret portable door fastener."
 3088. Watkin Moss, for "Improvements in drawing T-squares."
 3151. Archibald John Owen, for "Improvements in taps for withdrawing liquids from vessels."
 3214. Niels Georg Söversen, for "Improvements in locks."
 3233. Henry Brown and George Robert Mitchell, for "An improved ventilating device."
 3250. James Farley, for "Improvements in means for making a tight joint between pipes or tubes employed for drains and other purposes."
 3269. William Sainsbury and Alfred Ernest Albert Bennett, for "Improvements in window frames and sashes."
 3315. Thomas James Hussey, for "Improvements in and relating to pipe joints."
 3334. Robert Thackray, for "Improvements in adjustable spanners or wrenches."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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*: As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

KINGSTON.—Suggestions invited for the Development of a Building Estate. The Secretary, Artisans' Land and Mortgage Corporation, 32 New Bridge Street, E.C.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ABERDEEN.—March 13.—For the Supply of 1,050 Tons of Portland Cement. Mr. W. Dyack, Burgh Surveyor's Office, Aberdeen.

ABERDEEN.—March 15.—For Internal Structural Arrangements at Grammar School. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

ABERDEEN.—March 17.—For Additions to Ardmeallie Houses. Messrs. Matthews & Mackenzie, Architects, Aberdeen.

ACKWORTH (YORKS).—March 20.—For Construction of a Covered Reservoir, Providing and Laying the Cast-iron Pipes, Sluices, Fire Hydrants, &c. Mr. Geo. Hodson, M.I.C.E., F.G.S., Bank Chambers, Loughborough.

BALLYMENA.—March 14.—For Building Manse. Mr. J. J. Phillips, Architect, 61 Royal Avenue, Belfast.

BARTON-ON-HUMBER.—March 17.—For Restoration of Bonby Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

BIRKENHEAD.—March 19.—For Boundary Walls, &c., for Destructor Site. The Borough Engineer.

BLOXWICH.—March 12.—For Building Infants' School. Messrs. Bailey & McConnall, Architects, Bridge Street, Walsall.

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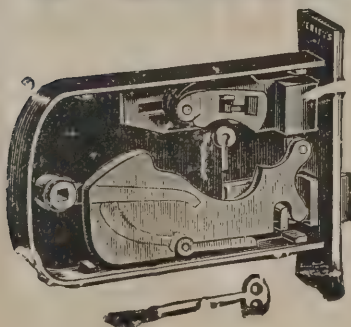
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BOTTOM, DORSET.—March 27.—For Erection of Five Dwelling-houses. Office of Works Department, 21 Craven Street.

BRADFORD.—March 9.—For Building Engine-house, Engine-bed and Store-room. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

BRIGHTON.—March 29.—For Constructing a Concrete Groyne, Storm-water Outlet, and an Overflow Chamber on the Beach, opposite Western Street; for Constructing a Storm-water Outlet and Making Additions to the Existing Groyne on the Beach opposite the Old Steine; for Constructing about 980 Yards of Brick Sewers, 8 Feet in Diameter, 562 Yards of Brick Sewers of Smaller Dimensions, and certain Pipe Sewers. Mr. Francis J. C. May, C.E., Town Hall, Brighton.

CAMBRIDGE.—March 19.—For Construction of a Sewage Pumping Station and Destructor Building in connection with Sewage Pumping Installation. Mr. John T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CAMBRIDGE.—March 19.—For Construction of a 24-inch Cast-iron Raising Main. Mr. John T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CARDIFF.—March 17.—For Rebuilding Merchants' Exchange. Mr. E. W. M. Corbett, Architect, Cardiff.

CHERTSEY.—March 19.—For Building Infirmary and other Additions to Workhouse (confined to Local Builders). Mr. C. Welch, Architect, London Street, Chertsey.

CHESHUNT.—March 26.—For Construction of about 3,200 Yards of Sewers. Mr. Samuel Towlson, Turner's Hill, Cheshunt.

COLCHESTER.—March 17.—For Erection of Iron Mission-room. Mr. Charles E. Butcher, Architect, 2 Queen Street, Colchester.

EASTLEIGH.—March 22.—For Gas Engines, Pumps, &c. Mr. H. J. Weston, Engineer, 24 Portland Street, Southampton.

ECCLIS.—March 17.—For Boilers, Engines, Pumps and other Machinery for Sewage Farm. Mr. L. Hinnell, Engineer, 15 Mawdsley Street, Bolton.

EGREMONT.—March 15.—For Building Four Slaughter Houses. Mr. G. Boyd, Engineer, 33 Queen Street, Whitehaven.

FULHAM.—March 14.—For Making-up and Paving Peterborough Lane and Eddiscombe Road. Mr. W. Sykes, Town Hall, Walham Green, S.W.

FULHAM.—March 14.—For the Supply of Granite, Hoggins, Flints, Ballast, Bricks, Lime and Cement, Stoneware Drain-pipes, &c., Tools, Implements and Castings, Smiths' Work and Repairs, Jobbing Work, Oilman's Goods, Scavengers' Brooms, Dust Baskets, &c., Timber, Stable Utensils, Horse Provender (for six months only), Disinfectants, Printing and Printed Forms, Stationery, Uniforms, &c., and the Maintenance of Public Lamps for a Period of Twelve Months. Mr. W. H. J. Denselow, Town Hall, Walham Green, S.W.

GLASTONBURY.—March 30.—For Erection of Police Buildings. The County Surveyor, 1 Belmont, Bath.

GOOLE.—March 17.—For Building Premises for the Goole Times Company. Mr. H. B. Thorp, Architect, Goole.

GRANGE-OVER-SANDS.—March 14.—For Building Three Villas. Mr. Stephen Shaw, Architect, Kendal.

HACKNEY.—March 14.—For Masons and Paviers' Work, Jobbing Sewer and Drainwork and New Road Work. Mr. Jas. Lovegrove, C.E., Town Hall, Hackney.

HOO ST. WERBURGH.—March 19.—For Building Infants' School. Mr. G. E. Bond, Architect, Victoria Buildings, Rochester.

HORWICH.—March 13.—For Building Cottage Hospital. Mr. Henry Sheldermine, Architect, Hunt's Bank, Manchester.

HULL.—March 9.—For Supply of 12,000 Tons of Stone for Macadamising. Mr. A. S. White, Town Hall, Hull.

ILMINSTER.—March 12.—For Extension of Grammar School and Girls' School, Fittings for Lavatory, &c. Messrs. Price & Wooler, Architects, Weston-super-Mare.

IPSWICH.—March 13.—For Building Girls' School and Additions to Infants' School. Mr. E. F. B. Shopp, Architect, 10 Museum Street, Ipswich.

ISLINGTON.—March 21.—For Electrical Plant and Machinery. Mr. Albert Gay, Vestry Hall, Upper Street, Islington.

KENDAL.—March 16.—For Additions to St. Thomas's Schools. Mr. Stephen Shaw, Architect, Kendal.

KINGSTON.—March 14.—For Supply of Granite, Brown Flints, Gravel, Stone Kerbing, Tar Paving, &c. Mr. A. J. Henderson, C.E., District Surveyor, Thames Ditton.

LARNE.—March 20.—For Royal Naval Reserve Battery and Drill Hall. Mr. P. J. Tuohy, Secretary, Office of Works, Dublin.

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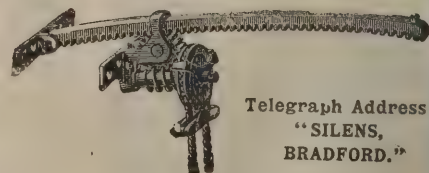


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MANCHESTER.—March 19.—For Building Offices, House, Stables, Boundary Walls, &c., at Gas Station. Messrs. Darbyshire & Smith, Architects, 17 Brasenose Street, Manchester.

NANTYMOEL.—March 21.—For Building Infant School. Mr. Jacob Rees, Architect, Pentre, Rhondda.

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PARKSTONE.—March 13.—For Building Cemetery Lodge. Mr. H. F. J. Barnes, Architect, Poole.

SALFORD.—March 19.—For Building School Board Offices. Messrs. Woodhouse & Willoughby, Architects, 100 King Street, Manchester.

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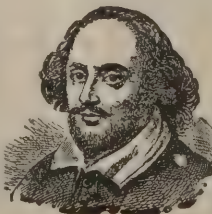
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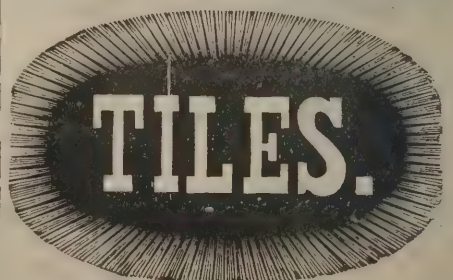
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"Model Dwelling," New-
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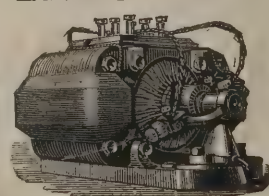
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LONDON—continued.

For Reconstruction of New Sugar House, New Filling and Cutting Sheds, Clyde Wharf, North Woolwich Road, Victoria Dock, E., for Messrs. David Martineau & Sons, Limited. Mr. W. P. RYAN, C.E., Architect, Thomas Chambers, Ingram Court, Fenchurch Street. Quantities by Messrs. F. WARBURTON, STENT & CURZON, Gracechurch Buildings, E.C.

Building Works.

Hall, Beddall & Co.	£12,485	0	0
B. E. Nightingale	11,980	0	0
Thomas Boyce	8,737	0	0
R. A. Yerbury & Sons	8,626	0	0
Holliday & Greenwood	8,577	0	0
S. & W. Pattinson	8,543	0	0
Scrivener & Co.	8,382	0	0
HOLLOWAY BROS. (accepted)	8,056	0	0

Constructional Iron and Steel Work.

R. Moreland & Sons	4,302	19	3
Handysides	4,125	0	0
YOUNG & CO. (accepted)	3,840	0	0

Patent Fireproof Partitions.

CUNNAH-WRIGHT (accepted)	34	13	9
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Glazing.

William Ramsey	110	13	8
Helliwell & Co.	110	5	0
Mellows & Co.	109	0	8
S. DEARDS & CO. (accepted)	95	16	6

For Improvements to Board School, Chatham Gardens, Hoxton. Mr. T. J. BAILEY, Architect.

W. M. Dabbs	£5,920	0	0	£65	0	0
W. Gregar & Sons	5,843	0	0	75	0	0
J. Grover & Son	5,834	0	0	61	0	0
G. S. S. Williams & Son	5,798	0	0	70	0	0
N. Lidstone	5,535	0	0	55	0	0
Treasure & Son	5,430	0	0	78	0	0
C. Cox	5,371	0	0	62	0	0
E. Lawrance & Sons	5,357	0	0	62	0	0
McCormick & Sons	5,097	0	0	54	0	0

A. Extra if Brickwork in Cement.

LONDON—continued.

For Rebuilding Boys, Girls and Male Infants' Offices in connection with the Powis Street School, Woolwich.

W. V. Goad	£1,112	0	0
Holliday & Greenwood	977	0	0
A. Black & Son	935	0	0
E. Proctor	900	0	0
J. Marsland	895	0	0
F. J. Coxhead	839	0	0

For Enlargement of Glynroad School, Homerton.

W. M. Dabbs	£3,805	0	0	A	£74	0	0
G. S. S. Williams & Son	3,804	0	0		83	0	0
J. Grover & Son	3,689	0	0		83	0	0
Treasure & Son	3,596	0	0		104	0	0
N. Lidstone	3,530	0	0		65	0	0
E. Lawrance & Sons	3,507	0	0		83	0	0
McCormick & Sons	3,482	0	0		74	0	0
C. Cox	3,199	0	0		83	0	0

A. Extra if Brickwork in Cement.

For Rebuilding Teachers' Offices in connection with the Caledonian Road School, Islington.

J. Grover & Son	£643	0	0
Davis Bros.	593	0	0
S. Polden	516	0	0
Kirby & Chase	510	0	0
F. J. Coxhead	468	0	0

For Six New w.c.'s for Infants' Department of the Brackenbury Road School, Chelsea.

J. Lyford	£189	15	0
G. Foxley	185	0	0
S. Polden	144	0	0
A. Salter	119	0	0

LUDDENDEN.

For Building Kitchen Wing and Appurtenances at Spring Bank. Mr. T. L. PATCHETT, Architect, Halifax.

Accepted Tenders.

J. & W. H. Fletcher, excavator, mason and bricklayer.
Eli Alderson & Son, carpenter and joiner.
Jonas Alderson & Son, plumber and glazier.
T. Alderson, slater and plasterer.



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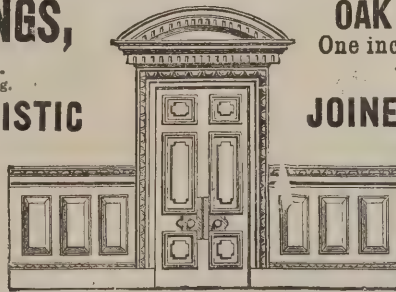
One inch and $\frac{1}{2}$ -inch thick.
Immense Stock always ready for Laying.



Turpin's Patent.

5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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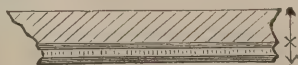


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$\frac{1}{2}$ -inch Parquet
Wood Backings

OAK BLOCK FLOORINGS

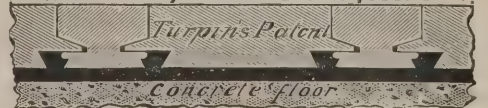
One inch thick, 4s. 10 $\frac{1}{2}$ d. per yard, super.
Also in Pitch Pine, Teak, Deal, &c.



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System of Preparing for Laying inch Block Floor on Concrete, Stone, and Deal Floors.

Section of wood block floors



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PROVIDENCE WORKS
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PUBLIC
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MALDON.

For Rebuilding Stables at Blue Boar, Maldon, for Mr. C. Armstrong, Manager and Receiver to the Colchester Brewing Company. Mr. J. W. START, F.S.I., Architect, Cups Chambers, Colchester and Harwich.

A. Baxter, Maldon	£287	15	6
E. West, Chelmsford	265	0	0
J. Gozzett, Maldon	250	0	0
J. SMITH, Maldon (accepted)	225	5	6

MORECAMBE.

For Building Business Premises, Morecambe. Messrs. RYCROFT & FIRTH, Architects, Bank Buildings, Manchester Road, Bradford.

Accepted Tenders.

H. Birkley & Sons, Wyke, near Bradford, mason and joiner.
R. B. Abbotts, Morecambe, plumber.
B. Sugden & Son, Bradford, plasterer.
Hill & Nelson, Bradford, slater.
J. Fletcher, Bradford, painter.

NEWARK.

For Engine and Boiler-house, Chimney, Cottages, and other Buildings, and Cooling Pond, at Farnsfield Pumping Station, for the Newark Corporation. Mr. HENRY ROFE, Engineer, 8 Victoria Street, Westminster.

HODSON & SON, Nottingham (accepted). £9,225 15 5

NEW ROSS.

For Building Cottage and Out-offices, &c., for the Guardians of New Ross.

M. Kehoe, Raheen	£120	0	0
P. Doyle, Wexford	116	10	0

RUSHDEN.

For Building House and Shop, and Alterations at the Corner of Church Street and Alfred Street, Rushden, for Mr. J. S. Clipson. Mr. H. ADNITT, Architect, Harborough Road, Rushden. Quantities by Architect.

H. Knight, Rushden	£673	10	0
R. Marriott, Rushden	650	0	0
T. Willmott, jun., Rushden	629	0	0
Bayes & Son, Rushden	605	0	0
T. & C. BERRILL, Irchester (accepted)	591	14	0
T. Fountain, Rushden (plumber's work only)	91	10	0

PRAZE.

For Building Board School at Moorfield, Praise, Cornwall. Messrs. WILLIAM CARAH & SON, Architects, Praise, Camborne.

Pengelly & Ireland, Camborne	£2,184	0	0
Julian, Truro	1,880	0	0
Delbridge & Co., Camborne	1,850	0	0
Nicholls & Son, Redruth	1,794	0	0
Pooley, Carn Brea	1,784	0	0
Carkeek, Redruth	1,776	0	0
Kistle Bros., Redruth	1,775	0	0
Mitchell & Dunn, Crowan	1,730	0	0
WHITE & THOMAS, Crowan (accepted)*	1,605	0	0
Stephens, Penzance	1,492	0	0

* About 6l. per Scholar.

SALE.

For Engine House, Gasholder Tank, Sludge Tanks, Sludge-pressing Room, Coke and other Stores, Manager's House, &c., at their Sewage Purification Works, for the Sale Local Board. Mr. ALEXANDER G. M'BEATH, Engineer, 4 School Road, Sale.

G. Bozen, Ashton-on-Mersey	£3,756	0	0
P. Smith, Sale	3,750	11	3
J. Byrom, Bury	3,611	0	0
J. A. Ewart, Warrington	3,594	0	0
C. Braddock, Wigan	3,376	4	0
J. Hamilton, Altrincham	3,206	0	0
Cross & Bell, Timperley	3,166	0	0
Brown & Co., Salford	3,017	0	0
W. Wilson, Sale	3,000	0	0
J. E. DEAN, Ashton-on-Mersey (accepted)	2,967	0	0

SLAITHWAITE (YORKS).

For Erection of New Schools, Schoolmaster's House and Boundary Walls at Wilber Lee, Slaithwaite, for the Slaithwaite and Lingards U.D. School Board. Mr. J. BERRY, Architect, Queen Street, Huddersfield.

Accepted Tenders.

W. Holroyd, Rocking Stone, Outlane, Huddersfield, mason.
J. Varley & Sons, Slaithwaite, joiner.
F. Goodhall, Marsden, plumber.
J. Walker, Slaithwaite, plasterer and painter.
W. E. Jowett, Huddersfield, slater and concrete.
J. W. Thornton, Huddersfield, heating.

Total cost, 2,100l.

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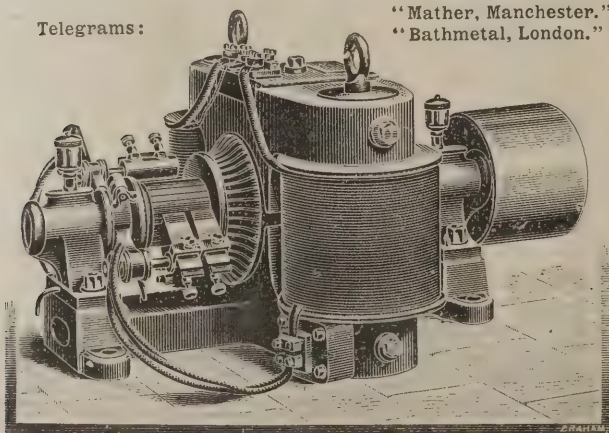
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PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. Vide Professor Frankland's Reports to the Registrar-General, July 1866, November 1867, and May 1870. The Lancet, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1873.

Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Baginbode Park, by H.R.H. the Duke of Cambridge, the Duke of the Medical Profession and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s. Water-testing Apparatus for detecting impurities in Water, 10s. 6d. and 12s. each.

157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



SANCREED.

For Cloakroom at Newbridge Board School, for the Sancreed School Board.

R. M'Clary, Drift	£59	10	0
BOTTRELL & THOMAS, Penzance (accepted)	48	5	0
Bottrell & Thomas, mason only	35	5	0
R. M'Clary, mason only	41	0	0
R. H. Roberts, St. Just, carpentry only	18	18	0
J. Rowe, St. Just, carpentry only	15	18	6
W. H. Hosken, Newbridge, carpentry only	15	10	0
J. James, Penzance, carpentry only	13	13	0

TODMORDEN.

For Street Improvement Works for the Todmorden Local Board. Mr. H. SHAW, Surveyor.

B. Lumb, Todmorden	£2,244	14	10
T. Gadfield, Rochdale	2,215	9	0
J. MacCabe & Co., Liverpool	1,986	17	2
J. Johnson, Lancaster	1,835	6	7
W. Chew, Nelson (part work)	1,600	10	8
T. HORROCKS, Burnley (accepted)	1,797	6	4

TRURO.

For Additions to the Red Lion Hotel, Truro. Mr. SILVANUS TREVAIR, Architect.

J. Julian, Truro	£1,180	0	0
J. COLLIVER, Truro (accepted)	1,081	0	0

WEDNESBURY.

For Laying-out Street, Mesty Croft. Mr. E. MARTIN SCOTT, Borough Surveyor, Wednesbury.

Curral, Lewis & Martin, Birmingham	£556	9	0
J. Cashmore, Tipton	480	0	0
J. Biggs, Birmingham	460	0	0
J. W. Fereday, Wednesbury	455	18	6
H. Holloway, Wolverhampton	439	0	0
Jones & Fitzmaurice, Birmingham	430	0	0
J. White, jun., Handsworth	427	3	8
G. LAW, Kidderminster (accepted)	400	0	0
H. Burnham, Darlaston	395	0	0

WESTON-SUPER-MARE.

For Additions to National Schools, Worle. Mr. SIDNEY JOHN WILDE, Architect, Weston-super-Mare.

W. M. Dubin, Weston-super-Mare	£475	0	0
C. Taylor, Weston-super-Mare	371	0	0
C. Addicott, Weston-super-Mare	365	10	0
A. J. Dorey, Weston-super-Mare	342	0	0
J. PALMER, Weston-super-Mare (accepted)	337	10	0

TRADE NOTES.

WE have recently had an opportunity of inspecting the extensive works at Berry Hill, Stoke-on-Trent, of Messrs. Henry Warrington & Son, manufacturers of glazed bricks, white and coloured ironstone enamel, glazed sinks, fireclay, firebricks, chimney-pots, &c., all of which are specialties of this firm, as well as ornamental bricks in all colours. As to the works themselves, they are among the most interesting of any we have visited, and the whole of the arrangements please the eye and leave an impression on the mind that beauty can be introduced into our large hives of industry. Anything we could say in commendation of the productions of the firm is warranted by the articles, which carry in themselves their own credentials. Messrs. Henry Warrington & Son are, moreover, fortunate in possessing a bed of splendid clay. Space will not now allow of any detailed description of the works, nor of the productions of the firm, but we should like to call the attention of our readers to a peculiar advantage possessed by this firm's system of enamelled brickwork, for ordinary and decorative purposes. As to colours and tints, they can be had in every variety and shade, but one great merit, as it appeared to us, was that part of the system by which a most perfect key is afforded. This has been patented, and the principle, as is the case of nearly all the best inventions, is exceedingly simple. The bricks are manufactured with an overlapping surface which is keyed on all sides, so that when fixed it is absolutely impossible for any moisture to penetrate through the joints formed by the cement. A perfect key or lock it will be found is produced by the overlap of the bricks, and the overlapping surface fits so closely that only the faintest stroke of cement is necessary just to show the joint—the unsightly mortar-joint being completely hidden by the overlapping enamelled surface. This is a great advantage as compared with the large mortar-joint, which cannot be avoided in ordinary brickwork. It cannot be doubted that many will appreciate this most useful invention, one which will save expense both as to time and cost, and produce perfection and solidity in construction and durability, besides making the walls absolutely weatherproof.

AMONG the works executed during last month and others about to be completed by Messrs. Burt & Potts, wrought-iron and gun-metal casement makers and engineers, York Street, Westminster, are the following:—Sandringham Hall, for H.R.H. the Prince of Wales; the Tower Bridge, for the City

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INCORPORATING PICTOR & SONS, RANDALL, SAUNDERS & CO., Ltd., I. SUMSION, CORSHAM BATHSTONE CO., Ltd.,
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SUMMER DRIED SEASONED STONE FOR WINTER USE.

FIRST-CLASS JOINERY

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B. E. NIGHTINGALE, Builder & Contractor,

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Corporation; Messrs. E. & P. Erard's new premises, 18 Great Marlborough Street; the Thames Conservancy Offices and the extension of the School Board Offices on the Thames Embankment; Arundel Castle and new church at Norwich, for His Grace the Duke of Norfolk, E.M., K.G.; Betteshanger House, for Lord Northbourne; Spring Grove House, Isleworth, for Mr. A. Pears; "Islet," Maidenhead, for Mr. E. Wagg; "Wern," Tremadoc, for Mr. R. M. Greaves; "Glangwna," Carnarvon, for Mr. J. E. Greaves; "Barton Pines," Paignton, for Mr. P. Whitehead; house at Marienberg, Cologne, Germany, for Herr F. Vorster; house at Bisham, Great Marlow, for Mr. J. Hayter; Tonbridge Grammar School, for the Worshipful Company of Skinners; the University Art Galleries, Oxford; the Girls' Middle Class Schools, Lincoln; Kensington Workhouse and Camberwell Workhouse; National Provincial Bank of England (Piccadilly branch), under Messrs. A. Waterhouse & Sons; new premises, Rye Lane, Peckham, for Messrs. Jones & Higgins; *Lloyd's Newspaper* Offices, Salisbury Square, Fleet Street, E.C.

WE hear that the Queen has had lifts erected at Balmoral, Osborne House, Windsor Castle and Buckingham Palace for her own exclusive use. Messrs. R. Waygood & Co. carried out the work, and have been appointed lift-makers to Her Majesty. Amongst other orders in hand are the following:—Queen Hotel, Harrogate; Palace Hotel, Kensington; Palace Hotel, Hastings; Hotel Métropole, Cromer; Crystal Palace, Sydenham; Messrs. Erard & Son, Great Marlborough Street; South-Eastern Railway passenger lift at London Bridge Station; Midland Home for Incurables, Leamington; an hydraulic patient's lift; passenger and other lifts for Messrs. Lazarus & Rosenfeld; Mr. Phelps, Milk Street; Messrs. Jones & Higgins, Peckham, passenger lift; also one for Messrs. G. Wright & Co., 153 Queen Victoria Street, and one patent triple-power balance passenger lift for the Liverpool Exchange, &c.

At the meeting of the Birmingham School Board the tender of Mr. B. Whitehouse, Monument Road, amounting to 12,509*l.*, for the erection of a school in City Road, Rotton Park, was accepted.

THE Worcester City Council have appointed Mr. Caink city surveyor and engineer, at a salary of 450*l.*, in the room of the late Mr. Purchas.

ELECTRICAL.

WORK is to be commenced at Coventry for the electric tramways. It is expected the cars will begin running in the summer. The system is that of overhead electric wires, and the trams will run to Bedworth, a distance of over five miles, with a regular ten minutes' service to and from Longford, the most populous three-fifths of the whole route.

At a meeting of the Edinburgh Corporation electric-lighting committee it was agreed that the charge for electricity should be 6*d.* per unit for lighting and 3½*d.* per unit for motors.

At the meeting of the Liverpool City Council a letter was read from Mr. Rouse, secretary Liverpool and Vicinity United Trades and Labour Council, enclosing copy of the following resolution passed at their last meeting:—"That this meeting of the Liverpool and District Trades and Labour Council urge upon the City Council, in view of the present exorbitant price of gas, to consider the possibility of utilising the tidal force for the generation of electricity, thus improving the lighting of the city at a reduced cost to the ratepayers, the construction of the works also affording employment for some of the surplus labour in the market."

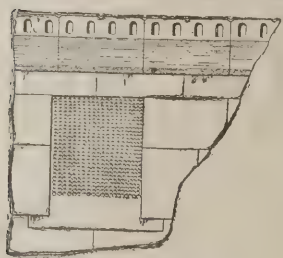
At the meeting of the Cheltenham Town Council the electric-lighting committee recommended that the tender of the Galloway Company for two of their boilers at 438*l.* 15*s.* each be accepted. They also recommended that the quick-running type of engine be adopted, but before finally deciding on the particular engines and alternators the committee thought it desirable to see and inspect the system in operation at Bristol, and that, subject to such inspection being satisfactory, the tender of Messrs. Siemens & Co., of Westminster, with Willan's engines, at 4,610*l.*, less 365*l.* for boiler, be accepted.

VARIETIES.

THE Duke of Hamilton has presented twenty acres of land to the town of Hamilton for the purposes of a public park.

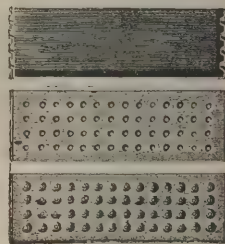
THE Aberdeen authorities propose clearing out the slum region of Exchequer Row and forming it into an open space or playground for children, at a cost of from 8,000*l.* to 9,000*l.*

THE *Scientific American* says:—The underground electrical conduits in New York City have now a length of 1,667 miles.



PATENT CONCEALED ROOF VENTILATOR (ELEVATION).

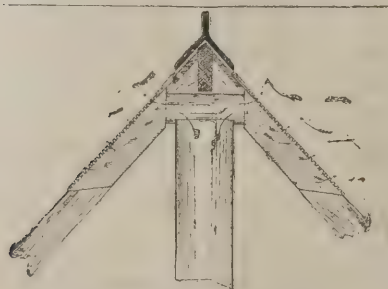
SUGG'S SYSTEMS OF VENTILATION.



PATENT FRESH-AIR INLET BRICK (SECTION, AND FRONT AND BACK ELEVATIONS).

SIMPLICITY and DURABILITY
Combined with **EFFICIENCY.**

MANUFACTURING AGENTS FOR
NORMANTON AND MAJOR'S PATENT VENTILATORS.



PATENT CONCEALED ROOF VENTILATOR (SECTION).

SOIL-PIPE
VENTILATION
A
SPECIALTY.

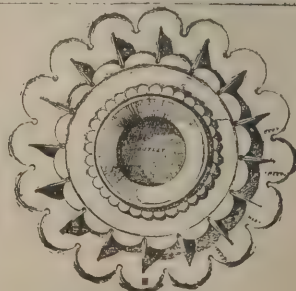


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**PERFECT VENTILATION
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MAKERS OF ALL KINDS OF
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PATENT CEILING INLET VENTILATOR.

MANUFACTURERS OF ALL KINDS OF APPARATUS FOR

LIGHTING, HEATING, COOKING AND VENTILATING.

Vincent Works, Westminster; Grand Hotel Buildings, Charing Cross, W.C.; 1a Ludgate Hill, E.C.
33 Bold Street, Liverpool; Amsterdam, &c.

In these conduits there are about 32,600 miles of telephone and telegraph wires and 1,300 miles of wire for lighting purposes, with which about 6,790 arc lights and 268,000 incandescent lamps are connected.

At the meeting of the Manchester Association of Students of the Institution of Civil Engineers, Mr. H. Stowell read a paper on "Refuse Destructors." He first dealt with the necessity for refuse destructors and the refuse to be destroyed, and then described various forms of furnace—Fryer's, Whiley's, Warner's and Horsfall's furnaces—also a modification of the last, now being erected at Agecroft for the Salford Corporation. He also described Jones's fume cremator and other appliances, and remarked upon the cost of destructors, the amount of refuse burnt and cost of burning. He also treated of the amount and disposal of clinker, the utilisation of the heat generated and of points to be observed in avoiding a nuisance.

THE Town Clerk of Crieff has received a communication from Dr. Meikle, of the Hydropathic Establishment, withdrawing his gift of a building, to cost over 3,000*l.*, for an infectious diseases hospital for the town, owing to the amount of opposition the matter had met with from the public.

THE sons of the late Mr. Robert Heath, of Biddulph Grange, at one time member for Stoke, have intimated their intention to give 20,000*l.* to the North Staffordshire Infirmary, for the purpose of building a convalescent hospital in memory of their father. Mr. Heath was head of the largest firm of ironmasters in North Staffordshire.

At the meeting of the Oswestry Town Council, a letter was read from the Local Government Board sanctioning a loan of 1,890*l.* for the construction of the waterworks, instead of the 2,250*l.* asked for.

At the meeting of the Hereford Town Council, the gasworks committee recommended that 7,000*l.* should be borrowed to carry out the works of improvement at the gasworks. The waterworks and lighting committee also recommended that 3,500*l.* be borrowed for the purpose of putting in new machinery at the pumping-house in connection with the waterworks. The reports were adopted.

THE proposal made some years ago to connect the east and west coasts of Scotland by means of a Forth and Clyde Canal sufficient to carry the largest ocean steamers, has been revived. The project was well received, and a preliminary survey was made, but as the Government would not give it support, the

cost was too much for private enterprise and the scheme dropped.

THE engineer to the Great Northern Railway Company has prepared the estimates of the cost of constructing the proposed new railways at Finsbury Park, to facilitate the suburban traffic of that company at Islington and Hornsey. The total estimated cost of the whole of the five new projected railways is set down at 386,662*l.*, of which it is estimated that 190,000*l.* will be expended in acquiring the necessary land with the buildings thereon. The sum estimated to be required for stations is 60,000*l.*

WE notice that Mr. Sell, of 167 Fleet Street, has brought out the "Directory of Registered Telegraphic Addresses," a work which has been long desired, but owing to official opposition could not be prepared. Mr. Sell has been successful in overcoming all obstacles, and has enriched business literature with a most useful volume. It is hardly necessary to say that the information supplied will enable time as well as money to be saved in correspondence.

WE have received from Messrs. Thomas Cook & Son, of Ludgate Circus, a copy of the programme of their proposed personally-conducted tour to Buluwayo. The excursion will leave London on April 14, returning to London on September 11. The territories to be visited include Cape Colony, Orange Free State, Transvaal, Matabeleland, Mashonaland, hunting-grounds of the Pungwe district, Manicaland, Natal, &c., with visits to the gold fields, diamond mines, ruins of Zimbabwe, and other prehistoric remains. The programme now before us is a little brochure with many illustrations, and accompanied by a useful little map. The views shown in the illustrations are taken from photographs, and add interest to the details given in the letterpress. Information is also given in regard to sport to be had *en route*.

THE bridges committee of the London County Council recommend an application to Parliament for power to rebuild Vauxhall Bridge, at an estimated cost of 454,000*l.*, including 30,000*l.* for a temporary timber structure, 50 feet wide, and that Lea Bridge be rebuilt at an estimated cost of 10,000*l.*

THE London School Board intend that all building contracts entered into in future shall contain a schedule of the rates of wages as generally recognised and paid at the time of the signing of the contract, in order to give greater security to the workmen.

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Court Road, HOUSE FURNISHERS & DECORATORS

Extract from THE GENTLEWOMAN (Mrs. PANTON)—"You can find all the furniture at Hewetsons', or if you are dubious of your own powers, you could either send me the pretty catalogue to mark, or my daughter could choose them next time she is in town, if you liked. The catalogue should certainly be seen; it is entirely a work of art, and most useful to country residents."

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HEWETSONS have always at hand a staff of steady and trustworthy men to send out to take up and relay carpets and entirely dismantle.

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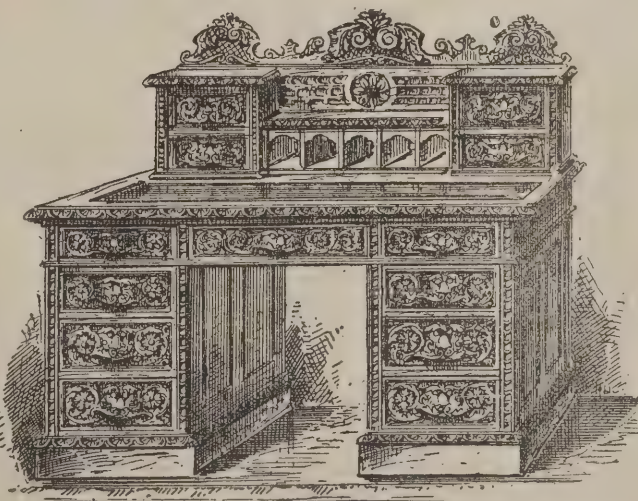
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Without Drawer and Pigeon-holes on Top, £10 10s.

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THING HILL, HEREFORD.

RESIDENCE, ST. MARY'S ROAD, LONG DITTON.

DESIGN FOR GREAT ROMAN BATH, BATH.

PUERTA DEL PERDON, SEVILLE, CATHEDRAL.

WELL IN AN OLD PALACE, JEREZ-DE-LA-FRONTIERA, SPAIN.

BUILDING AND BUILDERS.

THE long-established "Laxton" has again made its appearance under the auspices of Kelly & Co., Limited. Experience has directed the proprietors and compilers to the safest sources of information concerning the cost of builders' work of all varieties. The appendices on legal and other subjects increase the value of the book, and can be safely employed as references in legal matters.

PLANS have been prepared for the erection of the new church of St. Aidan, for the conventional district of School Lane and Withy Trees, in the parishes of St. Leonard's, Walton-le-Dale, Preston, and St. Saviour's, Bamber Bridge. It is proposed to spend about 5,000*l.* on the first part of the structure.

THE *Glasgow Herald* says:—Messrs. Moss, Thornton & Kirk are at present negotiating for the purchase of the entire block of Gaiety Buildings in Sauchiehall Street, including shops, tenements and theatre. When the purchase is completed they purpose making extensive structural alterations and erecting an elaborately-appointed theatre, to be conducted on the same lines as the Empire, Edinburgh, which is acknowledged to be a most successful and high-class variety theatre. Messrs. Moss, Thornton & Kirk have variety theatres in Bristol, Birmingham, West Hartlepool, South Shields, Newcastle, Edinburgh, and the Gaiety and Scotia, Glasgow.

THE general committee of the Staffordshire General Infirmary have decided to recommend to the governors and subscribers a scheme of reconstruction, which is estimated to entail an expenditure of 12,000*l.* or 13,000*l.* Recently a new wing has been added to the Infirmary, but it is now found that total reconstruction of the main building, which dates from 1766, is most desirable, and this the committee propose to effect at the cost stated.

THE stoppage in the building trade of Newcastle and Gateshead, which for three weeks has laid idle two thousand men and prevented building work in the district being carried on, has terminated at a joint conference of the masters and the men. It is proposed to take steps for the formation of a conciliation board, which shall deal with all differences in future.

At the municipal meeting, Pollokshaws, the building committee recommended that the plans of the tenement which Mr. George Beveridge proposed to erect at the corner of Bengal Street and Main Street be passed. Considerable discussion took place, Bailie M'Naught strongly opposing the plans, on the ground that they did not comply with the building regulations. The Provost said if the Commissioners were too strict building enterprise in the burgh would be killed. They could not on all occasions adhere to the letter of the law. The plans were ultimately approved.

NEW CATALOGUE.

WE have received a catalogue entitled "Metal-jointed Bamboo Furniture," Mr. W. F. Needham's patent. Mr. Needham in submitting this second catalogue, with revised price list, calls attention to the fact that it comprises a largely increased number of designs—a result mainly arising from the success attending the first catalogue, and the generally recognised importance of the patent metal joint and brass shoe, and the patent method of securing table flaps. The latter essentials, which impart to bamboo furniture that solidity, durability and finish absolutely requisite to articles intended for daily or even occasional use, are of much advantage, as furniture to which they are not applied lacks strength, and is liable to damage even in being dealt with in the handling inseparable from business, and before reaching the customer. Illustrations have been introduced into this catalogue demonstrating the adaptability of bamboo to the complete furnishing and artistic decorating of rooms, halls, staircases, &c. The pieces of furniture shown are principally stock numbers to approximate the cost of furnishing a room or rooms, decorating being necessarily a matter of estimate. A feature of this issue is the new bamboo window blind. The advantages claimed for it are (1) no discolouring in course of time, (2) artistic yet inexpensive, (3) can be renovated by the simple

The Cheapest Substantial Relief Decoration Extant

Sanitary: Beautiful: Works. Queen's Mill Lancaster

Wall Decoration

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Durable Inexpensive

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Suitable for all Decorative Purposes

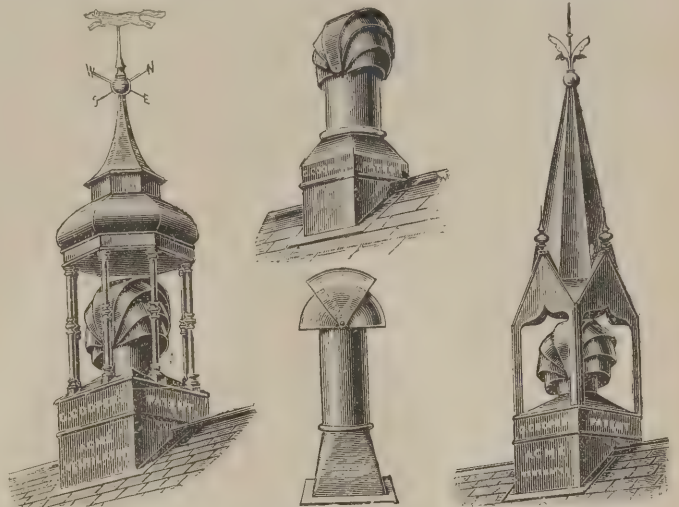
Capable of the most artistic treatment

application of ordinary naphtha varnish. New designs are being continually brought out, as may be seen by an inspection of the showrooms in Branston Street, Birmingham. Estimates or designs are prepared upon necessary particulars being supplied. Before leaving the manufactory the tables are accurately fitted, and care should be taken when unpacking them that the parts of each are kept together, so that when refitted each occupies its original and specially-fitted place. The bamboo bars are marked with numbers corresponding to those on the sockets to which they have been specially fitted. These numbers are underneath the bars, and in putting the tables together the numbers on the bars and sockets must be in line. The illustrations in the catalogue show very clearly the artistic effects that can be obtained at a very small cost by use of this material.

THE "ACME" VENTILATOR AND CHIMNEY-TOP.

MR. GEORGE COOPER, of the Electric Works, Sheffield, is the patentee of this excellent contrivance for the prevention of down-draught of smoke into a room. The "Acme" consists of a number of shields, which are rivetted to a common axis and so arranged that they cover up in a radial manner the whole of the opening at the top of the air-shaft, space being left between the edges of each shield. By this means, whether the wind descends, ascends, travels obliquely or laterally, it creates a continuous and powerful up-current. This combination of a ventilator and chimney-top seems a perfect arrangement, based on the simplest principles. Mechanical parts are avoided, and therefore less attention is required, and no after cost for repairs. Ventilation is provided for in the openings between the shields, and the area of these being twice as large as the area of the air shaft a free discharge of vitiated air is provided. Perhaps the most important feature in the "Acme" ventilator and chimney-top is that the slightest wind, no matter from what quarter, will create an up-current. Mr. George Cooper is no tyro in the science of ventilation, for as long ago as 1851 he invented the "Venetian" chimney-top, which was exhibited at the Polytechnic Institution, Regent Street. He has been endeavouring ever since to discover a means of effectually preventing down-draught in chimneys, and now claims to have accomplished this, and he trusts that its merits may be generally appreciated. There is certainly a demand for such a trustworthy appliance. We notice that the "Acme" has been used at the

new Theatre Royal, Sheffield; Wesley College, Sheffield; by the Dukes of Norfolk, Portland, Devonshire, and also by prominent architects all over the country. We may add that the

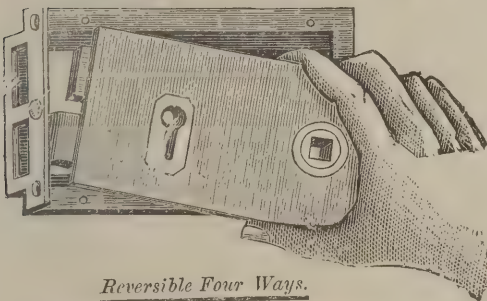


"Acme" ventilator and chimney-top is made of plain and ornamental patterns to suit all requirements, and that the price and quality will compare favourably with any in the market.

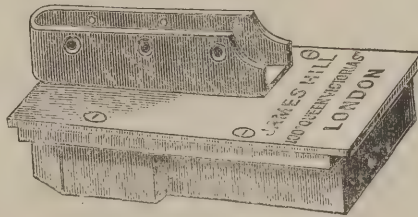
SUBMERSION OF THE PHILÆ TEMPLES.

IN a letter to the *Times*, Lieut.-Colonel Justin C. Ross, late Inspector-General of Irrigation in Egypt, writes:—I notice in your paper of February 28 that "Civil Engineer," writing from Chester, puts forward as a reason why the Philæ temples should be drowned that the water would beautify the site by cleaning away the mud huts of the Christian period, and that if the temples did not suffer from immersion any more than the stones of its river face wall have suffered there would be no harm done. He, in the first place, forgets that the coloured pillars would lose their colour. But, worse than this, his letter shows such an imperfect knowledge of the working of the Nile reservoir that his whole argument is vitiated. He

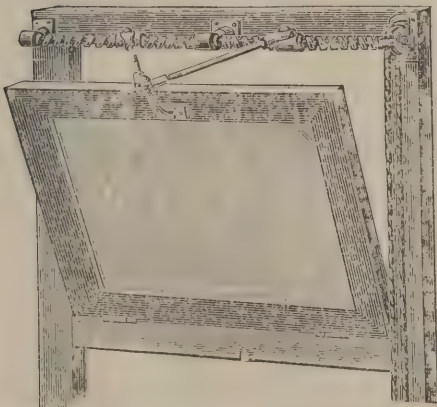
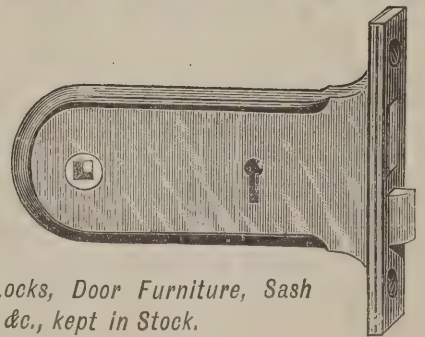
HILL'S PATENT LOCKS & OTHER FITTINGS.



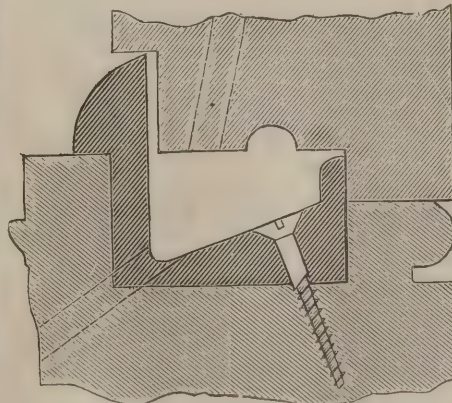
Reversible Four Ways.



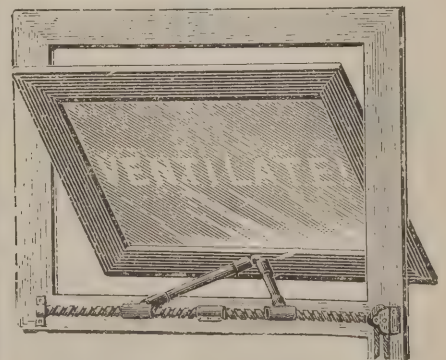
All kinds of Rim and Mortise Locks, Door Furniture, Sash and Casement Fittings, Swing Hinges, &c., kept in Stock.



Hill's Patent Gearing for Fan-lights, Skylights, Lantern-Lights, &c., made to suit lights hung every way, and worked with cord or rod.



HILL'S NEW REGISTERED
WATER BAR
FOR CASEMENTS OPENING INWARDS.



Buyers should satisfy themselves that goods offered by other firms do not infringe Hill's Patent Rights.

Prices and Particulars on Application.

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thinks that the island would be submerged from May to September—months in which few non-official Europeans travel. He also says that during the tourist period the island would appear clothed with verdure and far more beautiful than it does to-day, as he supposes that the arid waste of crumbling mud hovels which now exist would be replaced by a beautiful garden.

I will now show how the facts stand in connection with the working of the reservoir.

The reservoir is not, as he imagines, a lake in the Nile Valley, to be filled with the surplus flood-water of the Nile from July 15 to September 30, but it is a lake held up by a series of sluices in a dam, which will pass the entire flood supply of the Nile through the bottom of the wall of the dam, and it is only after October 20 or thereabouts that any impounding of water will be effected. We Indian engineers are to a man against any impounding of the Nile flood or "red" water, as the reservoir would silt up in a somewhat short time, and because the impounding of the "red" water would deprive Egypt of a large quantity of its precious mud deposit. It would also be impossible to impound flood water in bad years in the height of the irrigating season. The Delta also requires a last flooding after the cotton and maize crops are matured to enable the fellah to sow clover and barley after these crops and to give a final flush watering to the wheat lands before sowing. If the reservoir is filled in the beginning of October a very large amount of this watering would have to be done by steam pumps at a heavy cost, as the Nile would be lowered below the level necessary to give flush irrigation.

The time for filling the reservoir may be generally assumed to be from November 1 to January 1, and the reservoir would probably rise over the temples of Philæ by December 1, so that when the tourists arrive in January the lake would be full, and it would be maintained full until May 1 at the earliest, and it would be gradually emptied in the summer months of May, June and half July. After July 15 the flood is rising, and the quantity of flood water passing Aswân is more than that in the river during June, with the future supply of ponded water added to the natural supply.

As to the cleansing influence of the Nile water as evidenced on the water wall of the temples, "Civil Engineer" forgets that in November and December the water, though not thick with mud, is so brown that one's hand cannot be seen at a foot below the surface. The mud at this season is a very fine slime deposit, which would gather on the temples, and in

June, when they emerged from their bath, they would be covered with a coating of mud about a quarter of an inch thick, which would flake off irregularly and the temples would have a very mangy appearance. Algæ would also grow in long festoons on the beautiful pillars, and would hang in withered strips on the retiring of the water.

I hope I have succeeded in showing that your correspondent, from a want of knowledge of the details of the scheme, may have inadvertently led some of your readers astray and given them a beautiful picture of the washed temples of Philæ smiling out of a beautiful public park with rose-gardens in their courts.

I would also call public attention to the fact that many of the members of the Egypt Exploration Fund had full evidence that the temples were to be flooded, and therefore your correspondent is wrong in saying, "The resolution assumes, without evidence, that if the temples are submerged for some months each year, they will be destroyed."

THE LIABILITIES OF JOINT CONTRACTORS IN SCOTLAND.

A RATHER novel action respecting the responsibility for accidents in buildings where there is no general contractor, in the English sense, has been heard before Lord Kyllachy in Edinburgh. The plaintiff, Mr. John Gardiner, sued Messrs. J. & A. Main—all the parties belonging to Falkirk—for 373*l.* 13*s.* 8*d.*, or alternatively for 186*l.* 16*s.* 10*d.* for payment of damages found due by the plaintiff to three of his own workmen in connection with an accident which occurred through the fall of a scaffold erected by the defendants for the use of the plaintiff's men. The plaintiff was the contractor for the mason-work of the Wesleyan Methodist Church, Falkirk, and the defendants were contractors for the carpenter-work. The peculiarity of the case was that there was no contract between the plaintiff and the defendants. The scaffolding was erected by the defendants under their contract with the church committee, and plaintiff's contract with the church committee made no reference to the subject. The defendants, however, undertook to the church committee to erect the necessary scaffolding where required by the mason, and the plaintiff averred that this was in accordance with the usual custom in building undertakings, and that according to such custom the church committee contracted with the defendants on behalf of the

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THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain.

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REVOLUTION IN THE COST OF ELECTRIC LAMPS.

THE "VENUS" GLOW LAMP, 1*s.* 4*d.*

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All Lamps guaranteed as to Life and Efficiency, and Tested before leaving Works.

 SPECIAL AND FANCY LAMPS OF EVERY DESCRIPTION AND VARIETY. 

Sole Agent for the Elektricitäts-Gesellschaft, Hamburg.

G. STRAUSS.

130 QUEEN VICTORIA ST., LONDON, E.C.

plaintiff, and they were consequently bound to the plaintiff to erect a scaffolding as required.

Lord Kyllachy said that what he had to decide was, in the first place, whether upon these averments he could sustain the action as one *ex contractu*, or could allow proof of the alleged custom in order to set up the alleged contract on the plaintiff's behalf. The contracts produced did not, in his lordship's opinion, support the plaintiff's contention that the common employers, the church committee, made a contract as regards scaffolding with the defendants on behalf of the plaintiff. They were just ordinary building contracts made between the tradesmen and their employer, and contained nothing which could set up a contract as between the tradesmen themselves. If this was the just construction of the contract deeds, was there any room for the proposed proof of custom? He could see none. The plaintiff, however, argued that he might maintain his action as one of relief upon grounds apart from contract, his suggestion being that he and the defendants were jointly liable, *ex delicto*, and that, although the workmen chose to go against the plaintiff alone, the liability ought to be equal, as it would be in the case of a joint and several debt. But his lordship saw no principle upon which the defendants could be made liable as was proposed, and accordingly dismissed the action with costs.

BOROUGH ENGINEERING IN AMERICA.*

If an engineer wishes to accumulate a large amount of peculiar experience, I know of no better plan to pursue than to have himself appointed city civil engineer in an old Indiana village, which, on account of some unexpected accident, finds itself suddenly started on the upgrade of prosperity and just budding into cityhood. The law authorising his appointment is peculiar, the city Council which makes the appointment is peculiar, but the most peculiar thing connected with the whole matter is, perhaps, the very peculiar idea that people generally have of the duties of the city civil engineer. The city where the writer began his career of city engineering was an old-timer, having been platted away back in the "twenties," and when I say platted I tell it all, for that was all that was done. No monuments were put in, no stakes were driven, and from the best evidence obtainable

* A paper read before the fourteenth annual convention of the Indiana Engineering Society, by C. G. H. Goss, city engineer.

the land itself was not even measured. As lots were sold they were measured with a grape vine, stepped off, or guessed at. In early times potato patches and onion beds were more to be desired than streets and alleys, so all doubts as to measurement went in favour of the lots. When one man built a fence on his supposed lot line, his neighbour farther up the street sighted out his lot line by this fence; thus the first fence on a street determined in a large measure the direction of the lines of that street. These and other arbitrary procedures were carried on while the town was passing through that uncertain stage when no one knew whether it would live or die.

One day the people of the county, in a fit of more than usual absent-mindedness, elected a resident of the village to represent them in the Legislature. This man was a long-headed patriot, and his sole qualification for a lawmaker was his undisputed ability to do the wrong thing at exactly the wrong time. This statesman thought he saw a danger signal ahead, and upon investigation he decided that the danger was that numerous Indiana villages might become large cities eventually. He concluded that this danger might be averted, and that the best method of prevention was to vacate as many as possible of the streets and alleys of these villages. He set to work and prepared a bill which made this vacation easy and expeditious. The Legislature, after carefully scrutinising this bill and finding therein no mention of civil engineers, concluded that it must be about right, and passed it. Immediately after its enactment the farmers purchased all the lots they could pay for, fenced them in with their lands, and the larger part of the town became cornfields and cow pastures. The town struggled along, however, and grew slowly in spite of the inhabitants until more room was needed. When these horny-handed grangers found they could turn several good dollars by selling lots, they wished they were back in town, but they did not know exactly how to get there.

About this time that mystery of mysteries, the county surveyor, came upon the scene. If he had ever been there before he had carefully and thoroughly obliterated his tracks. He was asked to lay off lots after the original plat of the town, and feeling at all times equal to any emergency he proceeded to his task. He traced his lines and turned off his angles by the needle, and measured his distances with a 4-inch rod chain that was anywhere from 10 to 18 inches too long. However, land was comparatively cheap, and if a lot was 68 by 136 feet instead of 66 by 132 feet, it was thought to be all right. If a man wished to build and did not have room

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(WELSBACH SYSTEM).

One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of 3½ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

ARGAND " 44 " " " " " "

SIEMENS' BURNERS, 23 calories per candle per hour.

WELSBACH " 10 " " " " " "

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS LIGHT CO., LIM.,
14 Palmer Street, Westminster, London.

enough on his lot he went into the street and took what he needed.

Time rolled on, and after the town had grown still larger it was incorporated and run under a town government and the marshal made street commissioner. This street commissioner and his successors succeeded in putting in operation a system of street building and drainage that was at the time the wonder and admiration of the entire community. When a street was finished under their plans it was about like this. The canal occupied one-half the street, and the excavated material from the canal was used to raise the remaining part of the street some 2 to 4 feet above the abutting lot level, so that the roadway was sure to be above high-water mark. In wet weather the street looked like an ordinary canal with the common towpath attachment. Their system of drainage also provided for "evaporators." These evaporators were natural depressions or basins, of which there were quite a number in the town. They made a canal along a street until it reached one of these basins and then turned loose the water, where it remained until infiltration and evaporation removed it.

The town government continued until 1884 when, after due ceremony, it gave place to a city government. The writer was present at the first meeting of the city Council and noted the expression of blank amazement upon the countenances of the members when their attorney informed them that under the law they must appoint a city civil engineer. Upon consultation they thought it best to inquire for what purpose a city engineer was needed. The attorney confessed that he did not know of any possible use they would ever have for an engineer, but the law directed that they appoint one and perhaps they should follow the law in this instance, especially as it would not cost anything. One councilman said that he had been elected to this important office by the intelligent people of his ward to represent and protect their interests, and if he was assured that the appointment of a city engineer would not conflict with the rights of his constituents to allow their cows, hogs and horses to run at large upon the streets of the city, he was willing to make the appointment. The attorney was pretty sure that a city engineer would have no power to restrain the liberty of the live-stock of the city. He thought the appointment was merely a matter of form, and he was confident that the city engineer would be allowed to exercise no authority at all and but a very limited amount of judgment and common sense in the management of city affairs. This explanation seemed to satisfy the Council and they immediately began to look about

for some one to appoint. At length a member who had some sort of grudge against me, proposed my name and they proceeded to ballot. My popularity and the fact that there was no other candidate, enabled me to poll the entire vote of the Council, and the mayor declared me duly appointed city engineer. I held the office about six months, during which time I did no work and consequently drew no pay, for the Council had fixed the engineer's wages at 2 dols. a day when he worked, and allowed him to do city work only when ordered. I decided to change my residence, and handed in my resignation full of expressions of regret and thankfulness for the high honours conferred.

The Council then appointed to the vacant office the county surveyor, George W. Pearce, a now deceased member of this society. The first thing he did after his appointment was to convince the Council by an object lesson that an engineer's work was worth somewhat more money than it had expected to pay. About the first systematic improvement undertaken was the building of eight squares of brick sidewalks on as many different streets. All work previous to this time had been paid for with funds from the general treasury, and when it was decided to compel the property-owners to pay for building the walks abutting on their property a mighty howl went up. The engineer was ordered to stake out the work and advertise for bids. He asked to be allowed to establish grades for all streets upon which work was contemplated. This was refused, the Council saying that the city had moved along remarkably well so far without grades, and it was likely they could get on without them for quite a while. They knew of no reason why an engineer should want a grade for a whole street from which to set one square of sidewalks. The engineer argued, begged, coaxed, demanded without avail, and finally, in sheer desperation, guessed out a grade for his walks. Soon after the completion of these sidewalks Mr. Pearce died, and the office remained vacant quite a while, as there was no engineer then in the city, and outside engineers demanded as much as 5 dols. to 8 dols. a day for their services, while labourers were receiving but 1.25 dol. a day.

Then the writer became a resident of the city again and was appointed city engineer. About this time the people residing in the vicinity of the "evaporators" became disgusted with being overflowed every time it rained enough to start the water in the canals, and they began hauling and dumping mud and sand on the streets until the people sitting in their front yards had to look up at an angle of about 30 deg. to see a



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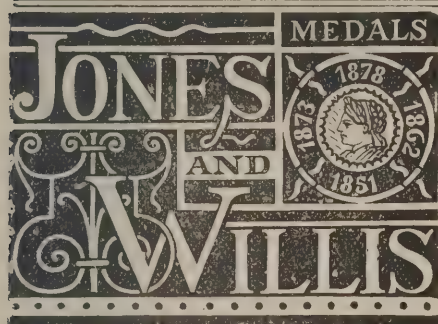
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carriage on the street. The street commissioner, who was an ex-road supervisor, contended that he was fully able to handle the street business without any help from the engineer. One day they set him to improving a street, and luckily his field of operations lay in the most difficult part of the city to drain. This street commissioner was a hustler; when he worked he worked, and very soon the residents along that street were anathematising the Council, the street commissioner, and the labourers on the work. The commissioner paid no attention, however, to this racket, and before the authorities could stop him had constructed in the street a fairly good reservoir, with ample capacity for a small waterworks plant. The outlandish system of street work practised necessitated putting in numerous culverts and footbridges, all built of plank with wooden foundations. The life of these structures was from four to five years, and as there were about 800 of them their maintenance was a source of considerable expense. One day a bridge over one of the canals went down with a team and badly crippled both horses. The owner of the team brought suit against the city, and had no trouble to procure judgment for the whole amount of the damage. The Council then undertook to investigate the bridge business, and in their extremity asked the opinion of the city engineer. He advised them to dispense with the entire lot of old traps. This advice alarmed them. Their fathers used these bridges; if they were removed the beauty and usefulness of the streets would be impaired. The engineer told them that if they would cut down the streets, put in curbing, and make common-sense gutters, the bridges would not be needed. After a time the Council decided to take out a few bridges as an experiment, and ordered the street commissioner to remove about a dozen of the oldest ones. The commissioner refused to do this, the old settlers having scared him. This action of the commissioner nettled the Council, and they dispensed with his services, appointing in his place a man who, they thought, knew just enough to obey orders. This new commissioner took out the bridges as ordered, and the job suited him so well that he kept up the good work without orders, and during the first month of his campaign took out about 400 of them. It took considerable time for the idea to work into the heads of the old settlers, but it finally got there, and they acknowledged that the taking out of the bridges was a great success. This admission was regarded by the engineer somewhat in the nature of a victory, and he duly thanked the hard-headed street commissioner who made its achievement possible. Shortly after this the Council ordered the engineer

to prepare and present plans, specifications and estimates for the improvement of the worst street in the city, down which a lively spring branch wound its way to a State ditch. This was the engineer's opportunity to impress the Council, and he took advantage of it. His plans provided for a modern brick-paved roadway, with first-class curbing and cement sidewalks. He proposed to carry the branch and storm water under the street in a sewer so constructed that it could become part of any sewerage system that might be adopted in the future.

At the next meeting of the Council the engineer was there with his plans, specifications and estimates. He decided to hold the estimates to the very last moment, not knowing the exact effect they would have on the members. At the proper time he spread the profile on the table and asked the councilmen to inspect it. Before beginning the survey for this street the engineer put in a good stone bench-mark and established a datum 100 feet below the top of this stone. In the explanation of the plans he thoughtlessly mentioned something about this datum. The remark precipitated more debate, and required more explanation. Finally the members agreed that they could not understand it at all, and could see no use for such a thing in connection with the matter in hand. The engineer then explained the plans for the street, urging, in the best language at his command, the desirableness of the improvement and the final economy of making it according to his plans. His explanation seemed to be very satisfactory to the Council, and just at the time when he thought things were coming his way with a rush, some one asked for the estimate of the cost of the work. It was given. When the Council recovered somewhat from their bewilderment and settled right down to business, they killed the project as dead as the historical door-nail in about one minute, and the engineer was obliged to gather up his papers and depart.

Finally, the people generally began to realise the fact that it was all well enough to have one or two watch-dogs of the treasury on duty, but that a city Council composed entirely of watch-dogs was undesirable. After this a great change was noticeable in the drift cast up by the waves after the annual political storms. The change was not abrupt, but it was sure. The engineer was consulted; his ideas and judgment were considered of value; he was employed and paid for his works. Public opinion regarding city improvements has changed materially for the better. Now, instead of fighting every enterprise the people are demanding improvements which the city is unable to give.



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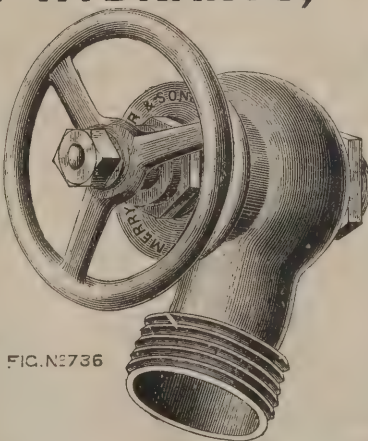


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CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

A PAPER was read before the last meeting of this Society by Mr. J. F. Reade, A.M.I.C.E., on "The Applications of Water Power." The author commenced by dealing with the principal matters requiring attention in the preliminary investigation as to the power to be obtained from any stream that it was proposed to make use of for obtaining power. He then proceeded to describe various machines employed in utilising the power to be obtained from water, among them being the undershot water-wheel, the breast water-wheel, the overshot water-wheel, the pitchback water-wheel, the Pelton wheel, and various turbines. At the conclusion of the paper a good discussion ensued, the following gentlemen taking part therein:—Messrs. E. H. G. Brewster, A.M.I.C.E., M.I.E.E.; E. T. Walrond, A.M.I.C.E.; H. J. Fereday, H. Coward, F. Spark, E. Perrett, W. Cooper Penn, J. O. Ince, J. Taylor, S. à Court, A.M.I.C.E., M.I.E.E., and S. Turner.

PILE DRIVING.

At the meeting of the Society of Engineers on Monday evening, Mr. G. A. Goodwin, president, in the chair, a paper was read by Mr. Henry O'Connor on "Pile Driving."

Mr. O'Connor said he recently heard a paper read before the Society of Engineers on the construction of a certain bridge in which piles were used to carry the foundations of the piers, and noticed what seemed to him a very small duty as being assigned to them, and that some considerable difference of opinion existed as to the amount of the load that could with safety be placed upon piles. Some year or so back the author was himself confronted with the vastly differing formulæ given in the various text-books which refer to this subject, and was induced to make numerous tests, the results of which he would venture to place before this Society, and which he trusts may be of some service to at least a few of the members. Now, according to the different formulæ given, the dead load requisite to force a driven pile further into the ground is calculable, but when the various results obtained show that with a certain pile this amount may vary between 72 tons and 300 tons, and in another case between 81 tons and 1,169 tons, it will be clearly seen that some of the formulæ at least are incorrect. Of these the one which, on first sight, appears to be most simple and most according to the rules usually adopted for calculating accumulated work, is that of Major Sanders; but on further consideration it may be very clearly seen that many other

things have to be allowed for before any formula can be said to give anything like correct or satisfactory results, and which require many other factors to be brought into the calculations.

Trautwine, in his pocket-book, says that Sanders in his rule gives no factor of safety. It seems evident to the author that Trautwine had at the moment forgotten the formulæ for accumulated work, or he would have taken the 8 on the lower side of the line as the factor of safety. As a matter of fact, Major Sanders calculates the force at the moment of impact in the usual manner and divides that by 8, no doubt because he has found by his practice this would be a safe load for a pile. That so great a difference of opinion should exist between men of such eminence as the compilers of these formulæ undoubtedly are, is most certainly an indication that there are many different circumstances governing the question. Of these the one which, it would appear to the author, has the most influence, is the question of the different soils through which the pile may be driven. The different strata which may be met with and through which the pile has to pass do not appear to have been taken into account in any of the formulæ which the author has been able to find. Mr. Morrison's suggestion, that allowance should be made for that portion of the pile which is outside the ground altogether, certainly appears to strike at the point, but not to go quite to the root of the matter. That such an allowance should be made is, without doubt, right, and is a point that few who give the matter even a moment's consideration will cavil at, but if this be the case when the pile is a short length out of the ground, it would appear to the author that the soil which surrounds that portion of the pile which is in the ground, and which is by far the greater part of the length, should be taken into consideration and its resistance to the bending tendencies of the pile allowed for in the calculation. It is this liability to bend which rapidly reduces in such a large proportion the strength of a column as it increases in the ratio of its height to its diameter. A reference was made to a diagram showing by the black line the strength of a hollow C. I. column of 15-inch diameter and 1-inch metal, according to its length, and by dotted line the strength of a 14-inch by 14-inch square pine column. By this the great difference in the strength was readily seen. Now this loss of strength as the height increases is mainly due to the tendency to bend which was before referred to, and if the column were sufficiently strongly stayed at various positions along its length the strength would be considerably increased, inasmuch as the column would then bear the load of the same as if it were only of the height between the parts stayed. The

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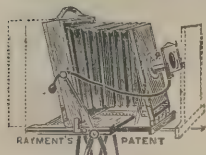
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staying properties of each layer or stratum of soil should, it would seem, be taken into consideration when settling any formula for such work, but it may be mentioned that to find out what this is a very difficult matter, and one which can only be done after repeated experiment, but the author would venture to lay before the members a method which he has adopted, and which gives a fairly accurate result. By driving either a trial pile or the first of the series which are to be driven into the ground, and by noting the exact set due to each blow of the falling ram, a fairly approximate estimate of the compressibility of each stratum may be obtained. The author recently had this noted in the case of two 14-inch square pitch pine piles, and gave the result of these tests. The depths of the various strata may be fairly easily determined by the sudden alteration in the distance the pile was driven by the ram. It should be here mentioned that in each case and in every blow a drop of 5 feet was used, so that, as far as the accumulated energy was concerned, it was uniform. Of course the absolute effective blow due to a falling body is lessened as the resistance of the object struck becomes less, and this must be taken into consideration when any calculations are made of the resistance of the ground. Another point which must not be lost sight of is the resistance due to the side friction, and this again brings in another difficult problem, and one which is not very easily solvable. To gain some insight into this the author has had some observations taken on the force necessary to withdraw a 14-inch pitch pine pile. Unfortunately there did not happen to be one which required drawing, which had been driven in exactly the same strata as were to be found in the spot where the pile which was tested at each blow was driven, but those to be removed were situated some few hundred yards away, and had been driven in the bed of the river Thames for the purpose of forming a stage for the upholding and directing of cylinders for a new pier, and also for the erection and building of girders, &c., for the approach to same. They were driven into the mud, which lay at about 15 feet below the finished top of pile, and was about 18 feet thick, then through a thin crust of ballast, and into a sandy silt to chalk at about 40 feet below the top of the piles. They were originally driven by a pile engine with a 30-cwt. ram driven by steam. It may be interesting to note the manner in which it is worked. Steam is connected by means of iron piping with knuckled joints, and finally indiarubber tubing to the top of the ram, which is of cast-iron and hollowed out in the same way as the ordinary pattern cylinder of an engine, but

with ports for inlet of steam, and the exhaust for same on the top, the piston-rod coming through the lower end and resting on the top of the pile. The ports are worked by a long double-ended lever, to each end of which a thin rope is fastened, and which serve to allow the apparatus to be worked from the ground level. In the case under notice the whole machinery was fixed upon a barge and was towed to and fixed at the different positions as required. On the admission of steam the pressure causes the cylinder to rise, the piston in this case being stationary until the required height above the top of the pile is reached, when the steam is shut off and at the same time the exhaust port is opened, when the cylinder, which, as before stated, weighs 30 cwt., is permitted to fall upon the pile and force it into the ground. A very large number of blows can be given with this arrangement in a very short space of time, and a fairly large amount of steam is required. But to return to the withdrawing of the piles. These had been driven some twelve or fifteen months, and had had the wash of the incoming and outgoing tides to consolidate the ground around, which was also rendered harder owing to the weight of water, which at high tide was about 15 feet high above the mud. This no doubt had the effect of making it far more difficult to remove the pile. At first it was proposed to withdraw them by means of a barge weighted at one end and with a short jib at the other, over the end of which the ropes and chains were led to the pile, utilising the rise of the river to lift. This was successful in the case of two or three very near the shore, but it was found that it was necessary on one occasion to let go the tackle as the barge was on the point of sinking. After this experience it was decided to work only at low tide, and to have the barge down upon the mud, lifting at this time by means of a crab on the barge. This worked successfully, but it was found that it took eight men, working on the handles of the crab, pulling with all their power, to start the pile, but after it had moved a foot it was comparatively easy.

Working out the gain by means of the crab, and taking the amount of power expended by the men at 40 lbs. each—the author is aware that the text-books mention only 20 lbs. as the force which a man usually expends when working a handle of a crab, but in this case the men were exerting themselves in no ordinary way, and he is therefore convinced the 40 lbs. taken above is not much, if anything, above the mark—the amount of power necessary to start the pile, allowing 10 per cent. for friction on the gearing, and allowing for the atmospheric pressure, was equal to 16 tons, and this, after deducting the

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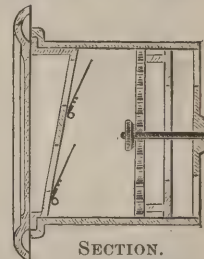
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weight of the pile, shows some 15 tons as the side friction on the pile. As before shown, the resistance of the ground and the side friction would amount to, say, 300 tons when nearly home, and 24 tons, say, when half-way down; therefore, this amount, less the proportionate amount of the side friction according to depth, may be taken as the absolute resistance which the ground at these points would give.

A column of pitch pine, 30 feet long and 14 inches by 14 inches, would carry an ultimate load of say, 640 tons, and at this limit would exert a side pressure distributed along the length of the pile, if the lower end may be assumed to be fixed, equal to 256 tons; now the average resistance of the ground may be calculated by taking a certain number of points in the height and calculating the resistance which the ground would exert, and taking the average of these and the area of the side of the pile, and calculating the proportion of that side to the area of the end, a fairly accurate estimate will be obtained of the resistance of the ground to the bending strain of the pile. Of course, if this resistance be greater than the force exerted in a horizontal direction, owing to the load on the pile, to a sufficient degree to be safe, the ground may be considered hard enough to form a thorough stay to the column.

In very many cases the author is quite sure that if this were taken into consideration the result would be astonishing, especially so when the piles have been driven through soft mud.

Another matter which must not be lost sight of is that if a column were subjected to a load of sufficient weight it would bend considerably before breaking, and although the weight which is thrown on a pile while being driven home by the ram does not nearly reach this load, yet in many cases it is quite half the ultimate breaking load of the column unstayed. As an instance of this, a cast-iron pile 30 feet long and 15 inches diameter of 1-inch metal may be taken; this would break under a load of 664 tons, and the load which would be upon it at the moment of impact, when a one-ton monkey which had fallen 5 feet struck it and gave it a set of one-fifth of an inch, a very ordinary blow, would equal 300 tons, or, say, half the ultimate breaking load. Now the deflection of such a beam at half the breaking strain is equal to about 2.2 inches, and this would cause a shortening of the pile, during the period of greatest load, of about three-sixteenths of an inch, and this on the removal of the load, which only rests momentarily upon the pile, would not be noticed when the set was being measured.

In this way a cause of error is easily accounted for, and it is this fact which renders the usual formula for accumulated work insufficient in the accurate gauging of the load which a pile may carry.

While driving some 164 piles in a new retort-house at Beckton recently some considerable difficulty was found in getting the piles to stand the test specified. It may be mentioned that the piles were of cast-iron, 15 inches diameter outside, and of 1-inch metal, with a circular point about 4½ inches diameter, tapering for about 1 foot 3 inches. It was specified "that the piles should be driven into the gravel to such a point of resistance that the impact due to a monkey weighing 1 ton falling from a height of 5 feet will not exceed a quarter of an inch for four blows from such ram or monkey. Whilst the piles are being driven a hard wooden dolly must be placed between the monkey and the head of the pile to prevent fracture."

A very serious trouble was experienced at the outset owing to the fact that the piles were driven in several cases through the thin crust of ballast without standing the specified test; the skin friction proved of so little good in sustaining the pile that it went right down to the hard chalk, found at about 75 feet from the surface. A number of different means were employed to prevent this. Shoes of the pattern shown were tried with varying success; next a wooden block, 8 inches all ways, was experimented with, and this proved very successful; so much so, that this principle has been adopted and the nose of the pile cast square.

Another point which had to be decided at the time was as to the meaning of the expression a "hard wooden dolly," no mention having been made in the specification as to whether the wood composing the dolly should have the grain running vertically or horizontally. Comparative tests were made, and this showed that a pile which had a set of three-eighths of an inch, due to the last four 5-feet blows of one ton, when the hard wooden dolly was 2 feet 6 inches long and placed vertically, and fitted into a wrought-iron driving cap, had a set of only five-sixteenths of an inch for four blows of the same character when the 16 inches by 16 inches timber was laid directly on to the pile without the interposition of the wrought-iron driving cap. This was no doubt owing to the surface of iron exposed to the dolly only being about 47 square inches, against 176 square inches when the driving cap was fixed on the pile.

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upon a pile which had been tested with the 2 feet 6 inches wooden dolly placed vertically over the iron driving cap, and had had a set of three-eighths of an inch only for the four blows. Wrought-iron joists and steel rails were gradually laid on until 100 tons had been placed, and beyond a set of three-sixteenths of an inch, when 20 tons had been put on the pile, taking its bearing upon the ballast, no further subsidence took place.

It was decided to continue the weighting up to 120 tons, when it was observed that the pile had gone down rather less than 1-16th inch. This latter weight, therefore, may be taken to be the amount required to drive the pile the same distance as the last blow of the ram as received by the pile with the wooden dolly vertically between. These cast-iron piles were mostly driven by a machine. In this machine an endless chain is kept continually in motion by a steam-engine, the chain being made of flat links, and the ram having a bolt which can be made by means of a lever to work into the chain; this lever is worked from the ground level by means of a rope, but is only used to drive the bolt into the chain. To release the bolt a bent iron staple is affixed at whatever height may be desired, so that it may just miss the ram on rising, but will engage with the lever on its side, and forcing it outwards withdraw the bolt and allow the ram to fall by its own weight and strike the pile. This machine appeared to work well, and a considerable quantity of piles were driven by it, and these at a very rapid speed, as frequently four piles 30 feet long have been driven to the test in one day.

A short while back the author read a description of some piles which had recently been driven in America, and was astonished at the enormous drop given to the ram, which was in some cases as much as 50 feet, and the weight of which varied from 2,800 lbs. to 3,200 and 3,800 lbs. Taking an average of these, say 3,300 lbs., and working out the accumulated energy imparted by such a blow when the set of the pile was 1½ inches, which it is stated was sometimes the case, this would equal over 589 tons. One is not surprised to hear that 8 per cent. of the heads crushed, despite an iron cap, and that the vibration of the blow was easily felt at a distance of some 400 feet.

Borings showed 10 to 20 feet of rubbish recently shot, next blue clay and quicksand down to 60 feet, then rock. Seventeen hundred piles were driven at 25½-inch centres, averaging 51 feet long, and were 16 inches square at the butt, tapering up to 11 inches at the other end.

The author would, however, observe that from his experience the increase of the blow, due to an increased fall of the ram, is not, in the case of a pile engine, in direct proportion to the height of the fall, this being probably due to the friction on the guides which keep the monkey from deviating from the direct line to the head of the pile.

Having made several tests to obtain an average of the extent to which this friction lessened the blow, he has found that with a pile which was being driven at an even rate into the ground with a 5 feet drop, when given a blow with the same ram and with a 7 feet 6 inches drop, the loss by friction was equal to some 6½ per cent., and with a further increase to a 10 feet drop the friction reduced the efficiency of the blow some 11½ per cent. The author, while he has not been able to propound a new formula for the calculation of the weight which may be safely placed upon piles, which would be correct under all circumstances, has endeavoured to point out some few methods of arriving at what matters should be taken into consideration when any particular calculations for the purpose are about to be made. For his own part, he should have no hesitation in placing 40 tons upon a 14-inch square pitch pine pile which had been driven into the soil to the test which has been previously mentioned as specified for the iron piles, and has been given to understand that some time back such a pile was loaded with 80 tons without showing any signs of sinking. With regard to the cost of pile-driving, as compared with excavating and timbering, a few figures may be of advantage. The cost of a 12-inch diameter iron pile of 1-inch metal, driven to a depth of 30 feet and filled with concrete, would be about 13½ s., and the cost of a 12-inch by 12-inch pitch pine pile, driven to the same depth, would be about 4½. This would have to be compared with the smallest hole that can be satisfactorily excavated, and this may be taken as 6 feet by 5 feet, and would cost for a depth of 30 feet, including timbering, use of timber and concreting, about 31½. That the last method of forming foundations mentioned would sustain a much greater load than either of those previously mentioned is easily understood; but there are many cases in which a smaller load has to be carried, and in these cases piles may be advantageously used.

In working out the strength of cast-iron piles, a diagram recently got out by the author for finding the safe load which might be placed on cast-iron columns, and which was published in *Work*, may be usefully employed. The curve laid down in the diagram is the result of an enormous number of calcula-

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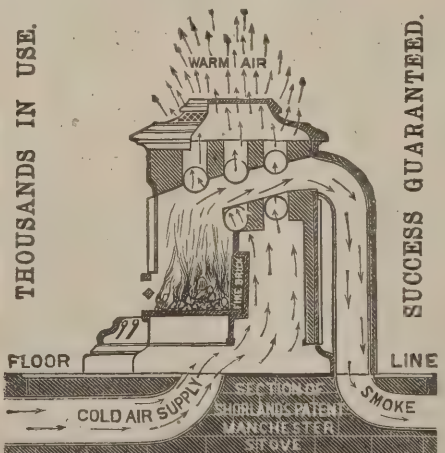
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tions, which were most carefully checked. I may mention that the safe load has been taken as one-tenth of the breaking load.

The method of using this diagram is as follows:—Having decided upon the approximate diameter of the columns and noted the number of diameters in the height, take the line opposite the corresponding number on the left-hand side of the diagram, and follow it until it is crossed by the curved line, and from the point where these two lines cut proceed vertically downward to find what division of the ultimate crushing load is necessary as a factor of safety.

By multiplying this divisor by the weight required to be carried, and dividing this by forty-nine (the number of tons which will crush a square inch of cast-iron), the necessary sectional area in square inches may be obtained.

INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting Mr. Alfred Giles, president, in the chair, a paper was read relating to the construction of the Liverpool Overhead Railway, by Mr. J. H. Greathead, M.Inst.C.E. He began with a history of the undertaking, which was the practical solution of a difficulty first experienced forty years ago, namely, the provision of better communication for passengers along the frontage (now extending to $6\frac{1}{2}$ miles) of the Liverpool Docks. The elevated railways in New York had been highly successful in meeting the wants of the travelling public, but were attended by several inconveniences. There were no parapets and no floors, the sleepers being placed directly on the top flanges of the girders. The result was that, as the railways were worked by steam locomotives, cinders, oil and water dropped into the street; fine shavings from the rails and tires fell on the foot passengers, and in one case, at least, a locomotive had fallen bodily into the street. Mr. A. G. Lyster, who had minutely studied the New York system and reported thereon to the Liverpool Corporation, had expressed himself in favour of an overhead electrical railway, and after some delay an Act was obtained in 1882 by the Mersey Dock Board for the construction of a double line of 4 feet $8\frac{1}{2}$ inches gauge. The estimate for this, fully equipped and worked by electricity, was 466,000*l*. The structure was intended to consist of plate girders, with overhanging continuous footways having parapets of iron lattice-work, with the rails laid upon greenheart planking, the whole being supported by columns of

partial lattice-work placed in the normal structure, one on each side of the lines of dock railway. Owing to the fact that many influential members of the Dock Board were unwilling to embark upon railway management, the undertaking was in 1887 leased to the present Liverpool Overhead Railway Company, by which the line was constructed.

The length of railway at present worked was 5 miles, but would ultimately be $6\frac{1}{2}$ miles. In the structure decided upon the columns were placed vertically under the ends of the main girders, about 22 feet apart from centre to centre, allowing sufficient width for two lines of standard gauge with the usual 6-foot way and admitting the use of carriages 8 feet 6 inches wide. Local circumstances in many cases did not, however, admit of the columns being placed immediately upon the main girders, and the latter were then carried upon cross-girders outside the line of columns. For considerable lengths also the columns had to be embedded in the boundary and warehouse walls. Owing to the presence of the dock lines below, cross-bracing of the piers in the usual way was impossible, and it was necessary to give to the columns and to the shallow cross-bracing connecting them at the top sufficient strength and rigidity to resist the lateral stresses due to wind-pressure, and, on curves, to the centrifugal force resulting from the motion of the trains.

In carrying out the works no special difficulties arose in connection with the foundations of the piers. In places where rock was not reached, masses of concrete were deposited of sufficient extent to insure the maximum load on the base not exceeding one ton per square foot. In excavating for the foundations the sill of the first dock made in Liverpool was discovered, and several lengths of old water pipes, consisting of trunks of trees bored out and fitted together, were brought to light. Owing to the railway being placed immediately over the dock-lines, the latter were in many cases diverted, straightened and improved. The columns supporting the viaduct consisted of two steel channel bars rivetted to two steel plates, forming a box column with all the rivet-heads outside. These columns were grouted into cast-iron sockets bedded in and bolted through the blocks of concrete. Cast-iron bumpers filled with cement concrete protected the columns from injury from passing waggons. The normal span was 50 feet, but longer spans up to 98 feet and shorter ones of about 30 feet were required in some cases. Up to 75 feet span the height of the girders above the rail-level did not exceed the platform height, and plate-girders were used. In longer spans bowstring-girders were used. Between the

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girders was fixed Hobson's arched-plate flooring, consisting of 5-16th inch plates bent to a radius of 12 inches, with a flat surface 6 inches wide on the top, rivetted to intervening T-bars, and made water-tight by asphalt run in the V-channels between the arches. The structure was so designed that the spans could be put together and rivetted up with floor complete at one or both ends of the railway, and be then transported over the completed portion of the structure to be placed in position. A special form of erecting-machine was provided, consisting of two lattice-girders standing upon legs resting on the ground at the front end, and at the hinder end upon a carriage running on rails on the viaduct. These girders were placed at such an altitude as to allow the trolley carrying the succeeding span to be rolled along underneath them. On these lattice-girders were placed two travelling-cranes, so arranged as to lay hold of the spans on arrival, run them forward, and deposit them in their permanent position upon the columns which had been erected in advance. The average time occupied by this operation was one hour per span.

In the course of the work several opening bridges had to be provided which were described and illustrated in the paper, as were also the stations, permanent-way and rolling-stock.

The total quantity of iron and steel in the structure was about 22,000 tons. The total capital cost, including equipment and all other charges, had been 550,000*l.*, or about 90,000*l.* per mile of railway. The line was formally opened by the Marquis of Salisbury on February 4, 1893, and was opened for traffic on March 6 following. The electrical system of working was completely successful, a five-minute service of trains being maintained with perfect regularity and without mishap of any kind. On the last August Bank Holiday about 40,000 passengers were carried in the space of eight hours.

VAUXHALL BRIDGE.

A REPORT on the rebuilding of Vauxhall Bridge has been prepared by the bridges committee of the London County Council. They say:—We have considered what means of transit across the Thames should be included in the Council's Improvements Bill to be introduced into Parliament during the session of 1895. There appear to us to be several schemes of pressing importance, but the most urgent are those for the reconstruction of Vauxhall and Lambeth Bridges. The consideration of these two crossings cannot very well be separated.

The question which has engaged our attention is whether one of these two bridges should be constructed before the other, and if so which, or whether it would be expedient to obtain powers for the reconstruction of both bridges in the same session of Parliament. Viewed as a public improvement, whether with reference to the road traffic or to that upon the river, in our opinion there can be no doubt that Vauxhall Bridge claims the more immediate attention. The reconstruction of this bridge involves no extensive system of street improvement, no opposition is likely to be encountered, nor would it necessitate any further expenditure for the approaches to render it at once and for all time of advantage to the public. The width of 80 feet having been decided upon, the reconstruction of the bridge would at once place two important railway stations, Vauxhall and Victoria, in immediate communication by tramway, which in itself would, we think, be of considerable public importance. With regard to the traffic over Lambeth and Vauxhall bridges, we find that in July 1891 the maximum for Lambeth Bridge varied from 118 to 130 vehicles per hour, whereas over Vauxhall Bridge the maximum varied from 720 to 721 per hour, and on comparing the traffic over Vauxhall Bridge with that taken in 1890 at Norfolk Street, Strand, it appears that the traffic over the bridge amounts to about 64 per cent. of that passing along the Strand. Taking the above figures, we may say that as regards traffic Lambeth Bridge is to Vauxhall Bridge in the proportion of about 1 to 7, and certainly, if we say that Lambeth Bridge accommodates not more than one-sixth of the traffic which passes over Vauxhall we shall be within the truth. Looking at the direction of the principal thoroughfares on both sides of the river leading to and from Vauxhall, Lambeth and Westminster Bridges, it appears to us that this disparity of traffic is likely to continue until some new line of thoroughfare is made from St. George's Circus over Lambeth Bridge in the direction of Victoria Street or the Victoria Station. The cost of a new bridge at Vauxhall, 80 feet wide, with gradients of 1 in 40, would be 380,000*l.*, including 30,000*l.* for a temporary bridge, and the property charges are estimated by the valuer at 74,000*l.* The latter will be incurred entirely on the south side of the river in respect of property opposite the gas works. Lambeth Bridge, with a width of 80 feet, and gradients of 1 in 30, would cost 386,000*l.* to rebuild, inclusive of 30,000*l.* for a temporary structure, and if the property to be acquired be limited to that necessary for widening the approach roads to 60 feet, with gradients of 1 in 30, its

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estimated cost as given by the valuer would be 95,100*l.* net, so that we get the following figures comparatively for the two bridges:—Total cost of Lambeth Bridge, 481,100*l.*; total cost of Vauxhall Bridge, 454,000*l.*—a difference in favour of Vauxhall Bridge of 27,100*l.* But this does not fully represent all the circumstances of the case. The above expenditure on Vauxhall Bridge would create at once an important public improvement, while the larger expenditure on Lambeth Bridge would require to be supplemented in the future by some very extensive and costly widenings, embracing Millbank Street, Horseferry Road, with a new street in addition thereto, and also Church Street, Lambeth; until these improvements were effected it could not be said that the public would reap the full benefit of the widened bridge. The cost of these widenings would probably amount to something near the cost of the bridge. We think it advisable to inform the Council of the present stability of the two bridges. The superstructure of Vauxhall Bridge would in all probability remain safe for many years provided the foundations remained intact. It is in its foundations that the bridge is weak. These were strongly reported against by Sir Frederick Bramwell and Sir Joseph Bazalgette some years ago, and since then the foundations of the piers have been protected by blocks of iron slag. The piers have recently been examined by a diver, who found that some of the deposited slag had been removed, but not to such an extent as to expose the timber, and we are now waiting for soundings to be taken above and below the bridge before reporting in further detail to the Council. The scour through the arches of the bridge must inevitably in course of time undermine the piers and the whole structure will then be liable to subsidence. We do not, however, apprehend that there will be any sudden collapse of the bridge, as it is anticipated that warning of impending failure would be given; at the same time, however, we think that the rebuilding of the bridge should not be much longer postponed. As regards Lambeth Bridge, it was undoubtedly in a shaky condition at the time it was taken over by the late Board, but the alterations and improvements subsequently carried out have, we are advised, placed it beyond the risk of immediate failure, especially as the weight of loads allowed to pass over it is restricted. We must, however, express our opinion that the bridge should be reconstructed at an early date. Upon a review of all the circumstances, we have come to the conclusion that Vauxhall Bridge should be rebuilt as soon as possible, and we therefore recommend—

"(a) That the Council do apply to Parliament for power to rebuild Vauxhall Bridge at an estimated cost of 454,000*l.*, including 30,000*l.* for a temporary timber bridge, 50 feet wide, to cross from the western end of the Albert Embankment to Millbank.

"(b) That the parliamentary committee, in conference with the bridges committee, be instructed to prepare a bill, to be introduced in the Session of Parliament for 1895, authorising the rebuilding of Vauxhall Bridge."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3513. Michael Terrance Fitzpatrick, for "Improvements in sanitary drain-pipes."

3527. William Stanford Foster, for "Improvements in methods of raising and lowering sash windows."

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3659. Edwin James Preston, for "Improvements in ventilating covers or manhole doors for sewer side entrances, cellar areas and the like."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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NOTICE.

Next Friday being Good Friday, THE ARCHITECT will be published on Thursday. All Advertisements intended for this Number must reach the Office not later than 3 p.m. on Wednesday, March 21.

TENDERS, ETC.

* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

KIRKCALDY.—March 17.—Plans, &c., are invited for proposed Beveridge Public Hall, Free Library and Adam Smith Memorial Hall, &c. Mr. W. Roy Spears, Town Clerk.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ABERDEEN.—March 17.—For Additions to Ardmeallie Houses. Messrs. Matthews & Mackenzie, Architects, Aberdeen.

ABERGAVENNY.—March 29.—For Building Stabling, Cartsheds, Workshop and other Works. Mr. J. Haigh, Town Surveyor, Abergavenny.

ACKWORTH (YORKS).—March 20.—For Construction of a Covered Reservoir, Providing and Laying the Cast-iron Pipes, Sluices, Fire Hydrants, &c. Mr. Geo. Hodson, M.I.C.E., F.G.S., Bank Chambers, Loughborough.

BARNSELY.—March 19.—For Additions to Premises, Monk Bretton. Mr. Herbert Crawshaw, Architect, Regent Street, Barnsley.

BARTON-ON-HUMBER.—March 17.—For Restoration of Bonby Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

BELFAST.—March 23.—For Alterations, Imperial Hotel. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BEXHILL.—March 16.—For Building Local Board Offices, Fire Engine Station, &c. Mr. Henry Ward, Architect, 8 Bank Buildings, Hastings.

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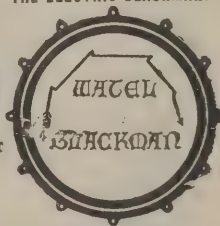
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BIRKENHEAD.—March 19.—For Boundary Walls, &c., for Destructor Site. The Borough Engineer.

BLACKPOOL.—March 22.—For Building Police Station. The Borough Surveyor.

BLYTH.—March 16.—For Building Board Schools. Mr. J. H. Morton, Architect, 50 King Street, South Shields.

BOTTOM, DORSET.—March 27.—For Erection of Five Dwelling-houses. Office of Works Department, 21 Craven Street.

BRADFORD.—March 16.—For Building Stables and Alterations to Turf Tavern. Messrs. H. & E. Marten, Architects, Charles Street, Bradford.

BRADFORD.—March 16.—For Building House and Shop and Thirteen Houses. Mr. A. Sharp, Architect, Albany Chambers, Market Street, Bradford.

BRIGHTON.—March 29.—For Constructing a Concrete Groyne, Storm-water Outlet, and an Overflow Chamber on the Beach, opposite Western Street; for Constructing a Storm-water Outlet and Making Additions to the Existing Groyne on the Beach opposite the Old Steine; for Constructing about 980 Yards of Brick Sewers, 8 Feet in Diameter, 562 Yards of Brick Sewers of Smaller Dimensions, and certain Pipe Sewers. Mr. Francis J. C. May, C.E., Town Hall, Brighton.

BURNLEY.—March 27.—For Building Three Police Stations. The Borough Surveyor.

BURTON-ON-TRENT.—April 5.—For Building Infectious Diseases Hospital. The Borough Surveyor.

BURY.—March 21.—For Alterations to Schools. Mr. D. Harding, Architect, Silver Street, Bury.

CAMBRIDGE.—March 19.—For Construction of a Sewage Pumping Station and Destructor Building in connection with Sewage Pumping Installation. Mr. John T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CAMBRIDGE.—March 19.—For Construction of a 24-inch Cast-iron Raising Main. Mr. John T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CARDIFF.—March 17.—For Rebuilding Merchants' Exchange. Mr. E. W. M. Corbett, Architect, Cardiff.

CARDIFF.—March 21.—For Building Sewer Ventilating Shaft (40 Feet High). The Borough Engineer.

CARDIFF.—April 11.—For Building Head Post Office. The Secretary, H. M. Office of Works, 12 Whitehall Place, S.W.

CHERTSEY.—March 19.—For Building Infirmary and other Additions to Workhouse (confined to Local Builders). Mr. C. Welch, Architect, London Street, Chertsey.

CHESHUNT.—March 26.—For Construction of about 3,200 Yards of Sewers. Mr. Samuel Towlson, Turner's Hill, Cheshunt.

COLCHESTER.—March 17.—For Erection of Iron Mission-room. Mr. Charles E. Butcher, Architect, 2 Queen Street, Colchester.

CREWE.—March 21.—For Additions to Schools. Mr. J. A. Atkinson, Architect, Hightown, Crewe.

DARNELL.—March 17.—For Building House, Offices, &c. Mr. E. Winder, jun., Architect, Wharf Street, Sheffield.

DERBY.—March 29.—For Building County Council Offices. The County Surveyor.

EASTLEIGH.—March 22.—For Gas Engines, Pumps, &c. Mr. H. J. Weston, Engineer, 24 Portland Street, Southampton.

ECCLES.—March 17.—For Boilers, Engines, Pumps and other Machinery for Sewage Farm. Mr. L. Hinnell, Engineer, 15 Mawdsley Street, Bolton.

FLIMBY.—March 21.—For Building House. Mr. Wallace Hodgson, 3 High Field Place, Flimby.

GLASGOW.—March 17.—For Gate Lodges, Waiting-rooms, &c., Botanic Gardens. The City Engineer, 64 Cochrane Street, Glasgow.

GLASTONBURY.—March 30.—For Erection of Police Buildings. The County Surveyor, 1 Belmont, Bath.

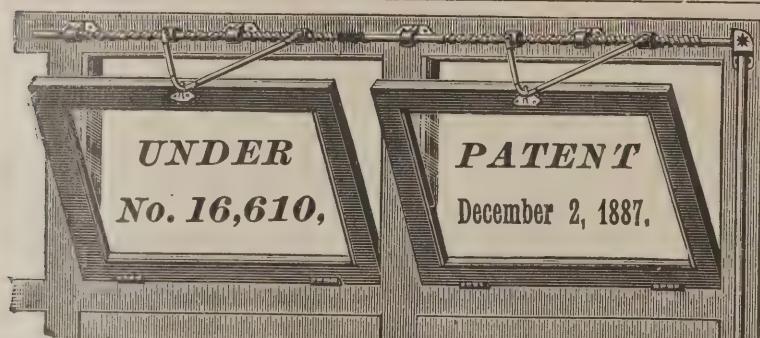
GOOLE.—March 17.—For Building Premises for the Goole Times Company. Mr. H. B. Thorp, Architect, Goole.

HARROGATE.—For all Trades (Joiner excepted) required in the Erection of Two Houses, Victoria Avenue and East Park Road, for Mr. Thos. Linskill. Mr. T. Butler Wilson, F.R.I.B.A., Architect, 12 East Parade, Leeds, and Harrogate.

HAVERIGG.—March 24.—For Building Parsonage. Mr. A. E. Bradley, 15 Horn Hill, Millom.

HONITON.—March 19.—For Restoring Tower of Broadhembury Church. Mr. G. H. Fellowes Prynn, Architect, 6 Queen Anne's Gate, Westminster.

HOO ST. WERBURGH.—March 19.—For Building Infants School. Mr. G. E. Bond, Architect, Victoria Buildings Rochester.



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KENDAL.—March 16.—For Additions to St. Thomas's Schools. Mr. Stephen Shaw, Architect, Kendal.

KETTERING.—March 24.—For Building Board School. Messrs. Gotch & Saunders, Architects, George Street, Kettering.

LANDPORT.—March 17.—For Building Offices and Printing Works for the *Hampshire Telegraph*. Messrs. Rake & Cogswell, Architects, Prudential Buildings, Landport.

LANDRAKE.—March 22.—For Building Schoolmaster's House. Mr. D. Ward, Architect, 8 Courtenay Street, Plymouth.

LARNE.—March 20.—For Royal Naval Reserve Battery and Drill Hall. Mr. P. J. Tuohy, Secretary, Office of Works, Dublin.

LEEDS.—March 21.—For Construction of Underground Conveniences. The City Engineer.

LEICESTER.—April 3.—For Preparing the Site, the Construction of a Concrete, Puddle and Earthen Dam or Embankment for a Storage Reservoir to contain about 500,000,000 Gallons and for Road Diversions, the Tunnel Outlet and Valve Tower and Valve House in connection with the Swithland Reservoir. Mr. J. Beverard, M.I.C.E., 6 Millstone Lane, Leicester.

LINTHWAITE.—March 27.—For Alterations to Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

LONGTON.—For Fitting-up Lavatory, W.C.s and Urinals at Market Hall. The Borough Surveyor.

LUDGVAN, CORNWALL.—March 26.—For Rebuilding and Alterations at and Additions to Commercial Hotel. Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Architect, Penzance.

MALMESBURY.—March 24.—For Construction of Brick Gasholder Tank. Mr. James A. Jones, Malmesbury.

MANCHESTER.—March 19.—For Building Offices, House, Stables, Boundary Walls, &c., at Gas Station. Messrs. Darbyshire & Smith, Architects, 17 Brasenose Street, Manchester.

MANCHESTER.—April 4.—For Building Inland Revenue Office. H.M. Office of Works, 12 Whitehall Place, S.W.

MILLBROOK.—April 2.—For Building Board School, House, &c. Mr. A. F. Gutteridge, Architect, 9 Portland Street, Southampton.

MORLEY.—March 29.—For Building Shop and Eight Houses. Mr. G. B. Clegg, Architect, Morley.

NANTYMOEL.—March 21.—For Building Infant School. Mr. Jacob Rees, Architect, Pentre, Rhondda.

NEATH.—April 2.—For Alterations to Board School. Mr. T. C. Wakeling, Architect, Merthyr.

SALFORD.—March 19.—For Building School Board Offices. Messrs. Woodhouse & Willoughby, Architects, 100 King Street, Manchester.

SETTLE.—March 17.—For Additions to Police Station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

SOUTHAMPTON.—March 29.—For Building Engineering Laboratory. The Borough Engineer.

ST. ALBANS.—March 20.—For Rearranging Lavatories and Drains at Workhouse. Mr. T. Foster Woodman, Architect, St. Peter's, St. Albans.

STAFFORD.—March 19.—For Building Electric-Lighting Station. Mr. J. F. Bell, Engineer, Gasworks, Stafford.

ST. HELENS.—March 19.—For Supply of Materials for a Period of Twelve Months. Mr. Wm. John Jeeves, Town Hall, St. Helens.

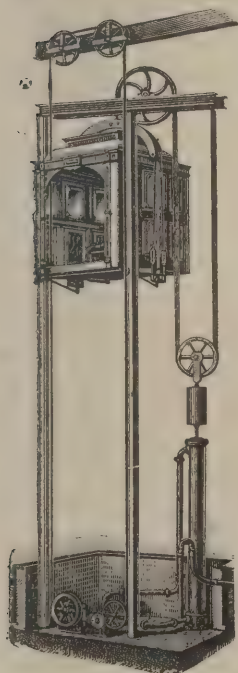
ST. JUST, CORNWALL.—March 23.—For Alterations and Additions to Pendeen Board Schools. Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Architect, Penzance.

TORQUAY.—March 27.—For Extension of the Existing Fish Quay by the Erection of about 300 Lineal Feet of Concrete Walling, Filling behind Same and Paving Deck with Portland Cement Concrete; the Erection on the afore-mentioned Quay of Offices and Coal and Fish Stores, &c., having a total Superficial Area of about 20,000 Feet. Mr. Henry A. Garrett, Town Hall, Torquay.

TOTTENHAM.—March 27.—For Making-up Sutherland Road, Ida Road, Hartington Road, Roslyn Road, Burlington Road, Kemble Road, Etherley Road (part of), Eckington Road, Hampden Road (remainder). Mr. P. E. Murphy, 712 High Road, Tottenham.

TOTTENHAM.—March 27.—For the Supply and Delivery on the Works of about 1,150 Tons of 16-inch Cast-Iron Water Main, with all Necessary Bends, Valves, &c. Mr. P. E. Murphy, 712 High Road, Tottenham.

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TOXTETH PARK.—March 27.—For Building Refuse Destructor Works. Mr. John Price, Engineer, Public Offices, Lark Lane, Toxteth Park.

WAKEFIELD.—March 19.—For Building Assembly Room and other Works. Mr. Wm. Watson, Architect, Barstow Square, Wakefield.

WINCHESTER.—March 28.—For Construction of Bridges (Steel and Brickwork) over Canal. Mr. James Robinson, Engineer, 13 Southgate, Winchester.

WINFORD.—March 22.—For Restoration of Church. Messrs. Nicholson & Son, Architects, Hereford.

YORK.—March 21.—For Alterations at Wellington Inn, Messrs. Hutton, Son & Horrox, Architects, 74 Albion Street, Leeds.

TENDERS.

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For Cutting Track, Providing and Laying 5-inch Cast-iron Water-pipe from Nine Wells Eyes to Service Reservoir, for the Urban Sanitary Authority. Messrs. LESLIE & REID, Engineers, Edinburgh.

J. Lamb, Hawick	£547	5	1
Henderson & Duncan, Morningside	539	10	0
J. H. Vickers, Nottingham	537	10	0
W. Scott, jun., Newbridge	515	0	9
H. Elliott & Son, Berwick	504	17	2
J. Morris & Sons, Edinburgh	499	10	0
J. Chisholm, Coldstream	493	14	2
J. McKnight & Son, Uphall	492	7	11
D. McDONALD, Hawick (accepted)	469	18	9

BODMIN.

For Laying Stoneware Pipes, Trenching, &c., Parish of St. Breward; Constructing Intakes, Manholes and Reservoir, 25 feet square and 8 feet deep, with Filter-chambers, for the Bodmin Waterworks Company. Messrs. S. W. JENKIN & SON, Engineers, Liskeard.

E. Duke, Plymouth	£1,615	10	0
M. W. Wickett, Camelford	1,050	0	0
W. Nankwell & Sons, Bodmin	590	10	0
W. H. THOMAS & SON, Camborne (accepted)	537	0	0

BRADFORD.

For Building Warehouse at Valley Mills, Manningham. Messrs. JAMES YOUNG & Co., Architects, 62 Market Street, Bradford.

C. Murgatroyd, Idle	£700	0	0
Illingworth Bros., Bradford	675	0	0
Davies & Jones, Manningham	647	0	0
J. Deacon, Shipley	635	0	0
F. IVES, Shipley (accepted)	575	0	0

BUCKHURST HILL.

For Laying Tar Paving to the Playground of Boys' Board School at Prince's Road, Buckhurst Hill, for the Chigwell School Board. Mr. E. EGAN, A.R.I.B.A., Architect, Loughton and Chigwell. Quantities by Architect.

G. C. Ratty, Bromley-by-Bow	£170	0	0
W. & C. French, Buckhurst Hill	162	15	10
Bensted & Son, Maidstone	161	2	10
W. Merrin, Reading	159	7	0
W. E. Constable & Co., London	159	6	11
Fry Bros., Greenwich	148	1	7
Jas. Aldred, Chiswick	142	0	0
J. J. Ingham, Bradford	132	10	6
A. W. Hobman & Co., South Bermondsey	130	15	0
D. Marchin, Bromley, Kent	126	18	0
Josiah Smart, Finsbury Park	125	9	3
North of England Asphaltic Co., Manchester	123	2	8
ASPHALTIC LIMESTONE PAVING Co., Queen Victoria Street, E.C. (accepted)	121	13	4

For Enlargement of Board School for Boys, Prince's Road, Buckhurst Hill, for the Chigwell School Board. Mr. E. EGAN, A.R.I.B.A., Architect, Loughton and Chigwell. Quantities by Architect.

C. S. Foster, Loughton	£2,958	5	0
H. Wells & Son, Buckhurst Hill	2,694	0	0
E. Fuller, Walthamstow	2,687	0	0
W. Radley, Chigwell	2,642	16	0
Jas. Rivett, Stratford	2,484	0	0
T. White & Son, Bow	2,461	8	9
H. Brown, Stoke Newington	2,448	0	0
T. Binney, Ilford	2,400	0	0
Jos. Holland, Leytonstone	2,400	0	0
W. Daniels, Buckhurst Hill	2,353	0	0
BATEMAN, Ramsey, Hunts (accepted)	2,177	0	0

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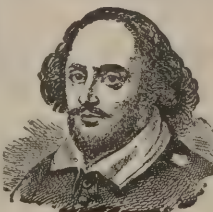
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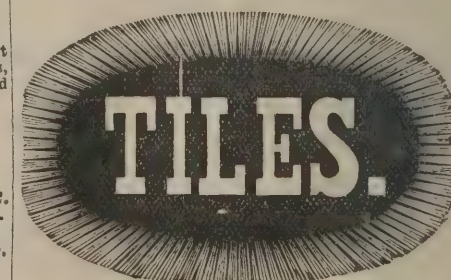
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YORKE & GOODWIN, Tunstall (accepted)	7,750	0	0

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J. Fidler, Eckington	1,763	0	0
Montague Dinnie, Langwith	1,717	0	0
G. Wright, Worksop	1,680	0	0
W. D. Askew, Chesterfield	1,666	0	0
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J. Bond, Grays, Essex	5,980	0	0
T. Adams, London	5,871	18	0
T. Cuthbert, Hyson Green, Nottingham	5,827	0	0
J. Dickson, St. Albans	5,739	0	0
H. Weldon, Birmingham	5,668	0	3
H. Vickers, Nottingham	5,575	0	0
D. Barry, Nottingham	5,560	10	6
Jones & Fitzmaurice, Birmingham	5,553	17	0
B. Cooke & Co., Battersea	5,379	0	0
J. Tomlinson, Derby	5,308	5	6
J. H. Vickers, Nottingham	5,190	0	0
T. SMART, Nottingham (accepted)	5,013	10	0
Engineer's estimate	5,060	0	0

Contract No. 2.

J. F. Price	21,332	12	0
T. Adams	18,852	9	9
Jones & Fitzmaurice	18,051	13	8
W. Jenkins & Son, Leamington	17,756	0	0
B. Cooke & Co.	17,735	0	0
J. Tomlinson	17,268	0	0
J. Dickson	17,249	0	0
J. Bond	16,850	0	0
J. Bradley, Lincoln	15,658	14	5
J. H. Vickers	15,600	0	0
D. Barry	15,485	6	0
T. Smart	15,429	10	0
H. Weldon	15,359	0	0
COPE & RAYNOR, Lenton (accepted)	14,447	1	0
H. Vickers	14,360	0	0
T. Cuthbert	14,234	0	0
J. Hawley & Son, Ilkeston (withdrawn)	13,683	16	9
Engineer's estimate	14,400	0	0

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B. Davies, Cardiff . . .	£4,450 0 0	£4,350 0 0
J. G. Thomas, Abergavenny . . .	4,368 0 0	4,362 0 0
T. Rees, Merthyr Vale . . .	4,277 0 0	4,197 0 0
J. Linton, Newport . . .	4,156 0 0	—
H. PARFITT, Pontnewydd . . .	4,000 0 0	*3,902 0 0
Hatherley & Carr, Bristol . . .	3,997 0 0	3,947 0 0
T. S. Foster, Abergavenny . . .	3,990 0 0	3,962 10 0
J. D. Williams, Knighton . . .	3,955 0 0	3,935 0 0
W. Lissaman, jun., Chipping Campden . . .	3,928 0 0	—
J. Jenkins & Son, Newport . . .	3,887 0 0	3,770 0 0

Architect's estimate, £4,000.

* Accepted.

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B. With Terra-cotta Dressings.

EGREMONT.

For Six-celled Fryer's Patent Refuse Destructor, with Boulnois & Brodie's Patent Charging Apparatus, Jones's Fume Cremator, with Necessary Buildings, Chimneys, Boundary Walls, &c., at Gorsey Lane, Poulton, for the Wallasey Local Board.

Accepted Tenders.

L. Mair & Son, Lodge Lane, Liverpool (Contract 1) . . .	£3,500 0 0
E. Gabbutt, Oakes Street, Liverpool (Contract 2) . . .	1,103 0 0
Manlove, Alliott & Co., Nottingham (Contract 3) . . .	3,145 0 0

LAZONBY.

For Construction of System of Sewerage for Lazonby, for the Penrith Rural Sanitary Authority.

J. GRAHAM, Lazonby (accepted) . . . £518 0 0

LIVERPOOL.

For Supplying and Fixing Mahogany Panelling and Fittings in New Offices, Old Hall Street, Liverpool, for Messrs. Arthur Guinness & Co., Limited.

S. J. WARING & SONS (accepted) . . . £400 0 0

LONDON.

For Building the new Amersham Grove Sunday School, New Cross. Mr. GEORGE BAINES, Architect, F.R.I.B.A., 4 Great Winchester Street, E.C.

F. & H. F. Higgs . . .	£1,801 0 0
H. L. Holloway . . .	1,730 0 0
B. E. Nightingale . . .	1,728 0 0
E. Houghton . . .	1,703 0 0
J. O. Richardson . . .	1,701 0 0
T. J. Gorham . . .	1,686 8 10
Battley, Sons & Holness . . .	1,579 0 0
F. J. Coxhead . . .	1,543 0 0
S. J. Scott . . .	1,539 0 0
Thomas D. Leng, Deptford . . .	1,420 0 0

For Engineering Work in Connection with New Baths and Washhouses, Lavington Street, S.E., for the Commissioners for Public Baths and Washhouses for St. Saviour, Southwark. Mr. F. J. SMITH, Architect, 17B Great George Street, Westminster.

T. A. Taylor, Finsbury Park . . .	£7,147 16 0
Ceres Ironworks, Limited, Kingston-on-Thames . . .	6,772 0 0
Sugg & Co., Limited, Westminster . . .	5,450 0 0
W. G. Cannon . . .	5,150 0 0
Clarke & Sons, Moorgate Street . . .	4,910 0 0
J. Fraser & Sons, Millwall . . .	4,738 0 0
Young & Co., Pimlico . . .	4,695 0 0
Strode & Co., Regent's Park . . .	4,667 0 0
Murdock & Cameron, Bucklersbury . . .	4,637 0 0
Benham & Sons, Limited, Wigmore Street . . .	4,495 0 0
J. & F. May, High Holborn . . .	3,939 0 0
BERRY & SONS, Westminster (accepted) . . .	3,845 0 0

For Adding Higher Standard School to Board School, Blackheath Road, Greenwich.

	A
S. J. Gerrard . . .	£13,273 0 0
Perkins & Co. . .	12,995 0 0
Hart Bros. . .	12,557 0 0
Lawrance & Sons . . .	12,340 0 0
W. Downs . . .	12,269 0 0
C. Cox . . .	12,060 0 0
J. & M. Patrick . . .	11,911 0 0
G. E. Wallis & Sons . . .	10,984 0 0

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LONDON—continued.

For Formation of Roads, Paths, and Airing Courts at Infirmary, Marloes Road, for the Guardians of St. Mary Abbots, Kensington. Mr. T. W. ALDWINKLE, Architect.

J. Meston	£3,897	0	0
Fry Bros.	3,482	0	0
Lagdon & Crawford	2,800	0	0
J. Bendon	2,740	0	0
Robertson & Grant	2,270	0	0
J. Mears	2,150	0	0
G. G. Ratty	2,125	0	0
HOBMAN & Co. (accepted)	2,102	0	0
J. Bowles	2,100	0	0
T. Adams	2,098	0	0
G. Wimpey & Co.	2,098	0	0
W. Johnson & Co., Limited	2,075	0	0
G. Neal	2,005	0	0
Mayo & Co.	1,978	0	0

For Shelters for Cricketers at Finsbury Park, for the County Council.

Woolwich Co-operative Builders, Limited	£582	10	7
W. A. Pryor	578	19	4
J. & M. Patrick	540	0	0
J. Borrows	509	10	0
M. B. England & W. J. Gale	465	4	8
S. Hipwell	445	19	9
Gardner & Hazell	439	0	0
Co-operative Builders' Society, Limited, London	424	7	0
W. Lawrence	415	6	0
A. Wallis	412	0	0
W. Wells	402	0	0
W. T. Williamson	394	0	0
Thomas & Greenwood	391	0	0
Stimpson & Co.	390	0	0
J. H. Newman	365	0	0
T. White & Son	356	17	6
G. E. Jeffries	344	4	8

For Sewage Pumps for the Barking Outfall Precipitation Works, for the County Council.

S. Owens & Co.	£2,802	11	0
T. Middleton & Co.	2,187	11	0
Thames Ironwork and Shipbuilding Co.	1,806	18	0
Pulsometer Engineering Co.	1,700	0	0
J. Cochrane	1,445	10	0

LONDON—continued.

For Making-up and Paving Cranbury Road, Fulham, for the Vestry. Mr. J. P. NORRINGTON, Surveyor.

Roadway.

Nowell & Robson, Kensington	£837	0	0
T. Adams, Wood Green	746	0	0
G. Wimpey & Co., Hammersmith	719	0	0
E. Parry, Fulham	715	0	0
H. J. Greenham, Hammersmith	690	0	0
J. Mears, Earl's Court	670	0	0

York.

H. J. Greenham	440	0	0
Nowell & Robson	427	0	0
T. Adams	418	0	0
G. Wimpey & Co.	415	0	0

Adamant.

T. Adams	321	0	0
Nowell & Robson	303	0	0
G. Wimpey & Co.	301	0	0

Victoria.

H. J. Greenham	346	0	0
Victoria Stone Co., Kingsland	323	0	0

Stuart's.

T. Adams	321	0	0
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Imperial.

T. Adams	321	0	0
Imperial Stone Co.	313	0	0

Indurated.

T. Adams	310	0	0
G. Wimpey & Co.	301	0	0
Victoria Stone Co.	277	0	0

For Provision of Cookery Centre in Connection with the Eglinton Road School, Plumstead.

W. Gregar & Sons	£998	0	0
A. Reed & Son	965	0	0
Holliday & Greenwood	950	0	0
Kirk & Randall	910	0	0
E. Lawrance & Sons	898	0	0
M. Calnan & Co.	892	0	0
J. Marsland	810	0	0
W. Holt & Sons	737	0	0

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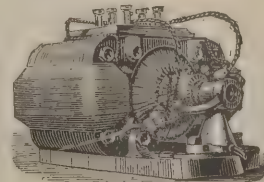
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For Alterations and Additions to Montague House, No. 57
Shepherd's Bush Green, W., for Mr. T. Pocklington. Mr.
E. MONSON, jun., F.R.I.B.A., Architect, Acton Vale, W.
Thomas Nye, Ealing £559 0 0
George Lyford, Uxbridge Road, W. 543 0 0
George Hooper, Acton 536 0 0
CHAMBERLEN BROS., Hammersmith (accepted) 519 0 0

For Cookery and Laundry Centres in Connection with the
Kilburn Lane School, Kensal Green.

G. Lyford	£1,507	1	3	£35	0	0
J. Mowlem & Co.	1,267	15	8	23	5	5
Lathey Bros.	1,239	0	0	35	0	0
F. G. Minter	1,158	0	0	42	0	0
Perkins & Co.	1,133	0	0	25	0	0

A. Extra if Brickwork in Cement.

For Lighting and Ventilating School, Bunhill Row.

Johnson & Co.	£94	16	0
W. Hornett	85	10	0
Stephens Bros.	73	0	0
Kirby & Chase	73	0	0

For Enlargement of Morning Lane School, Hackney, by 200
Places.

N. Lidstone	£3,388	0	0	£20	0	0
G. S. S. Williams & Son	3,202	0	0	26	0	0
J. Grover & Sons	3,009	0	0	25	0	0
McCormick & Sons	2,866	0	0	24	0	0
C. Cox	2,595	0	0	26	0	0
J. Allen & Sons	2,504	0	0	20	0	0

A. Extra if Brickwork in Cement.

For Rebuilding w.c.'s in Connection with the Gipsy Road
School, West Norwood, and Re-laying the Drains.

W. Downs	£1,550	0	0
W. V. Goad	1,485	0	0
W. Hammond	1,380	0	0
C. A. Heinemann	1,380	0	0
L. Whitehead & Co.	1,300	0	0
J. Frampton	1,300	0	0
F. & H. F. Higgs	1,285	0	0
Holloway Bros.	1,282	0	0
Holliday & Greenwood	1,277	0	0
J. Garrett & Son	1,162	0	0

LONDON—continued.

For Reconstructing Boys and Girls' Offices in Connection with
the Salter's Hill School, West Norwood, and Providing
New Offices for Infants and New System of Drainage.

W. Hammond	£1,089	0	0
F. & H. F. Higgs	1,065	0	0
F. Frampton	1,000	0	0
The Co-operative Builders, Ltd.	993	0	0
A. Black & Son	983	0	0
J. Smith & Son	969	0	0
H. Mallet	813	0	0

For Rebuilding the Boys and Infants' Offices in Connection
with the Wellington Street School, Hoxton, and Providing
Partly New System of Drainage.

Cowley & Drake	£1,050	0	0
E. Lawrance & Sons	1,046	0	0
Holliday & Greenwood	989	0	0
Stevens Bros.	945	18	0
S. Polden	939	0	0
J. T. Robey	901	11	0
A. Salter	887	0	0

For Enlargement of Hackford Road School, Brixton, by 400
Places, and Provision of Laundry Centre.

Lathey Bros.	£6,140	0	0	£120	0	0
J. Smith & Sons	6,113	0	0	128	0	0
E. Lawrance & Sons	5,863	0	0	110	0	0
Holliday & Greenwood	5,795	0	0	127	0	0
Holloway Bros.	5,779	0	0	97	0	0
F. & H. F. Higgs	5,773	0	0	121	0	0
C. Cox	5,716	0	0	110	0	0
Hart Bros.	5,641	0	0	134	0	0

For Enclosing, Draining and Tar-Paving Additional Land in
Connection with the Rolls Road School, Bermondsey,
Erecting New w.c.'s, and Providing Drainage for all Depart-
ments of the School and Removing Covered Ways and
Re-dividing Playgrounds.

W. Downs	£2,000	0	0	£30	0	0
Holloway Bros.	1,975	0	0	32	0	0
Holliday & Greenwood	1,965	0	0	30	0	0
J. Marsland	1,955	0	0	33	0	0
Mid-Kent Building and Con- tracting Works, Limited	1,919	0	0	27	0	0
E. Lawrance & Sons	1,796	0	0	30	0	0

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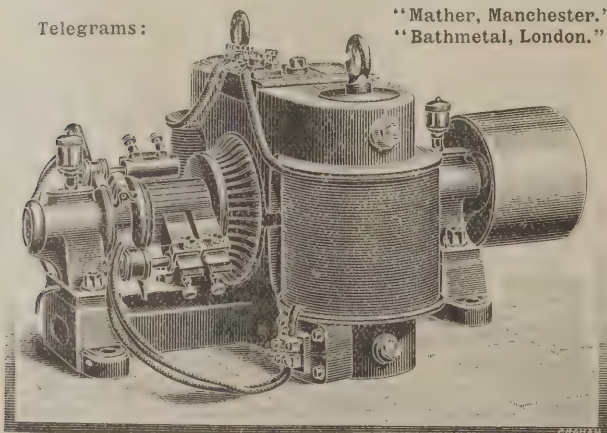
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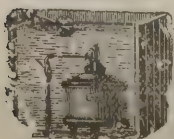
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For Alterations and Additions to Premises, Cheap Street, Newbury, for Messrs. McIlroy & Rankin Mr. WALTER HENRY BELL, Architect, Market Place, Newbury.
G. Head, Burghclere £389 0 0
J. A. Dann, Newbury 384 12 6
S. Elliott, Newbury 347 19 3
W. H. Taylor & Son, Greenham 343 10 0
E. JAMES & SON, Newbury (accepted) 310 0 0

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For Building Eighty Houses at Penyrheol, Tylorstown, Rhondda Fach, for the Trustees of the Stanley Building Club. Mr. T. R. PHILLIPS, Architect, Old Bank Chambers, Pontypridd.
J. JENKINS & SON, Porth (accepted) £13,280 0 0

PETERBOROUGH.

For Building Four Houses, Mayor's Walk. Mr. M. HALL, Architect.
MACHIN, Peterborough (accepted) £620 0 0
For Building Drying-shop, for Messrs. Sellars & Son, at Woodstone, Peterborough. Mr. M. HALL, Architect.
SIBLEY, Peterborough (accepted) £100 0 0

RUGBY.

For Construction of Sewer, Caldecott Street and Hillmorton Road, House Drainage Connections in Dunchurch Road and Union Street, for the Rugby Local Board. Mr. J. H. BRIERLEY, Surveyor.

Caldecott Street and Hillmorton Road.

W. G. Satchell, Rugby £66 0 0
J. Hollowell, Rugby 61 0 0
W. T. HALL, Rugby (accepted) 59 0 0
J. Holme, Leicester 58 0 0

Dunchurch Road and Union Street.

J. Holme £73 10 0
W. G. Satchell 70 0 0
W. T. Hall 70 0 0
J. HOLLOWELL (accepted) 66 18 0

RUSHDEN.

For Building Shop and Two Dwelling-houses at the Corner of Queen Street and Rectory Lane, Rushden, for Messrs. E. Claridge & Son. Mr. H. ADNITT, Architect, Harboro Road, Rushden. Quantities by Architect.
A. Trayner, Thrapston £670 0 0
H. Knight, Rushden 545 0 0
Bates & Son, Rushden 539 0 0
T. Wilmott, jun., Rushden 528 0 0
T. & C. Berrill, Irchester 513 0 0
W. H. Lovell, Raunds 506 0 0
R. MARRIOT, Rushden (accepted) 506 0 0

SHREWSBURY.

For Erection of a Wall, for the Estates Committee. Mr. W. CHAPPLE EDDOWES, Borough Surveyor.
H. PRICE, Shrewsbury (accepted) £179 8 0

THE LIZARD.

For Building Residence at The Lizard. Mr. SILVANUS TREAVAIL, Architect, Truro.
J. Julian, Truro £1,495 0 0
G. Williams, Mullion 1,389 0 0
George & Sons, Mullion 1,382 0 0
W. H. Stephens, Penzance 1,295 0 0
HILL & TIDDY, Lizard (accepted) 1,250 0 0

TUNSTALL.

For Erection of a Group of School Buildings for the Wolstanton School Board. Mr. A. R. WOOD, Architect, Town Hall Buildings.
T. Godwin, Hanley £7,120 0 0
W. Grant, Burslem 7,110 0 0
C. Cope, Tunstall 6,786 0 0
C. Smith, Tunstall 6,700 0 0
YORKE & GOODWIN, Tunstall (accepted) 6,697 0 0

WHITEHAVEN.

For Building Infectious Diseases Hospital, for the Trustees of the Town and Harbour. Mr. J. S. BRODIE, Town Surveyor.
S. McWhinney, Workington £4,376 2 9
W. BRADLEY, Millom (accepted) 3,954 17 2
J. Young, Whitehaven 3,944 10 0
D. Burns, Whitehaven (plumbing, &c., only) 280 0 0

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Balaam Brothers	£23,638	0	0
Hart Brothers	23,384	0	0
Allen & Son	22,425	0	0
Hearle & Farrow	21,887	0	0
H. Lovatt	21,763	0	0
Lawrence & Son	20,637	0	0
Geo. Sharpe	20,450	0	0
Lorden & Son	20,420	0	0
Reed & Son	20,247	0	0
Gregar & Son	19,819	0	0
Stimpson & Co.	19,790	0	0
Holt & Son	19,575	0	0
W. J. Maddison	19,140	0	0
F. J. Coxhead*	18,659	0	0

* Accepted subject to the approval of the Education Department.

WOOLWICH.

For Rebuilding the Premises at 58 Powis Street, Woolwich, S.E., for Messrs. H. Cuff & Co. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 44 Norcott Road, Stoke Newington, N.

Chessum & Sons	£1,260	0	0
Multon & Wallis	1,259	0	0
H. L. Holloway	1,244	0	0
Young & Lonsdale	1,232	0	0
H. Brown	1,169	0	0
Balaam Bros.	1,135	0	0
J. Chapman	1,077	0	0

For Rebuilding Boys, Girls and Male Infants' Offices in Connection with the Powis Street School, Woolwich.

W. V. Goad	£1,112	0	0
Holliday & Greenwood	977	0	0
A. Black & Son	935	0	0
E. Proctor	900	0	0
J. Marsland	895	0	0
F. J. Coxhead	839	0	0

WITHINGTON.

For Building Wall and Construction of Approach Road, at the Didsbury Recreation Ground, for the Withington Local Board. Mr. A. H. MOUNTAIN, Surveyor.

Wall.

G. Gilmore, Bradford	£216	9	0
France & Hughes, Prestwich	206	12	0
M. Naylor & Sons, Hulme	203	16	6
G. Bozon, Ashton-on-Mersey	201	11	0
J. Farnsworth, Ardwick	190	13	6
J. & J. Parish, Withington	175	5	6
Worthington & Pownall, Manchester	172	6	3
Executors J. L. Ward, Manchester	162	13	2
A. MASON, Didsbury (accepted)	160	5	0
J. Hampton, Old Trafford	155	19	6

Road.

W. Vaughan, Longsight	262	8	4
A. Mason	223	16	1
J. Farnsworth	220	2	11
France & Hughes	207	0	7
G. Clarke, Bristol	202	1	8
N. Naylor & Sons	184	4	10
G. Bozon	166	6	3
WORTHINGTON & POWNALL (accepted)	146	11	5

For Laying Earthenware Pipe Outfall Sewer, with Manholes, at Chorlton-cum-Hardy, for the Withington Local Board. Mr. A. H. MOUNTAIN, Surveyor.

W. High & Co., Cheetham	£1,050	0	0
France & Hughes, Prestwich	816	15	5
R. Lomax, Eccles	811	2	8
W. Hardy, Rochdale	783	11	8
G. Bozon, Ashton-on-Mersey	772	13	3
A. Kellett, Manchester	772	12	10
M. Naylor & Sons, Manchester	763	13	11
D. Finlay & Co., Pendleton	730	0	3
W. Snape & Son, Eccles	705	6	2
Worthington & Pownall, Manchester	664	13	5
G. CLARKE, Hulme (accepted)	602	3	5

WOKING.

For Repairs and Additions to Outbuildings of various Schools, for the Woking School Board.

C. Fifield, Woking	£353	12	0
W. Millard, Woking	189	0	0

HEWETSONS, Tottenham LONDON, W.

HOUSE FURNISHERS & DECORATORS

Extract from THE GENTLEWOMAN (Mrs. PANTON) — "You can find all the furniture at Hewetsons', or if you are dubious of your own powers, you could either send me the pretty catalogue to mark, or my daughter could choose them next time she is in town, if you liked. The catalogue should certainly be seen; it is entirely a work of art, and most useful to country residents."

CLUBS, HOTELS, &c.—DISMANTLING, CARPET-BEATING, &c.

HEWETSONS have always at hand a staff of steady and trustworthy men to send out to take up and relay carpets and entirely dismantle.

DECORATING.—HEWETSONS give ESTIMATES free of charge for PAINTING and all kinds of Interior Decorations, Structural Alterations, Sanitary Work, Electric Lighting, &c.

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completely Furnished at three days' notice for £150, £300, &c., and delivered, carriage paid, to any railway station in Great Britain.

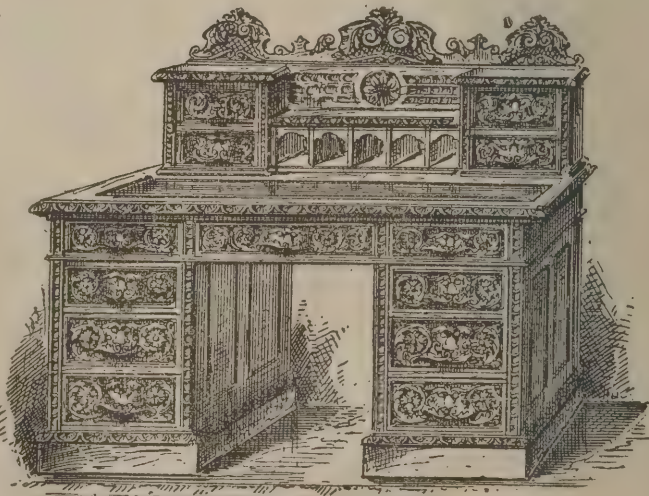
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is the best and most complete Furnishing Guide published, and is forwarded free of charge. It contains ESTIMATES for FURNISHING HOUSES for £150, £300, £500, £1,000, &c., each article in detail, illustrated and priced.

ARCHITECTS' Plans and Designs exactly and faithfully worked to.

Tenders Free for ELECTRIC LIGHTING.

SANITARY Work, STRUCTURAL Alterations, and every kind of Interior & Exterior DECORATIONS.



440.—English Carved Oak Writing Table, Leather Top, on Casters, £15 10s.

Without Drawer and Pigeon-holes on Top, £10 10s.

N.B.—House and Estate Agency Offices (213 Tottenham Court Road),
SURVEYORS, AUCTIONEERS AND VALUERS.

HEWETSONS, TOTTENHAM COURTRD., LONDON, W.

WREXHAM.

For Reslating Certain Roofs at the Workhouse, for the Guardians.

W. Cooper, Wrexham	£60	10	0
E. Bird, Adwy, near Wrexham	60	0	0
J. Hughes, Wrexham	52	7	0
J. Oliver, Wrexham	51	6	6
J. T. Jones, Cefn, Ruabon	45	0	0

BUILDING AND BUILDERS.

A NEW Wesleyan chapel has just been opened at Newbridge, Cornwall, by the Rev. W. H. Thompson, chairman of the district synod. Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Penzance, was the architect.

At the meeting of the Glasgow Dean of Guild Court, permission was granted to Lord Provost Bell and the committee of the Association for the Promotion of Art and Music in Glasgow to erect the new Fine Art Galleries in Kelvingrove Park.

THE annual meeting of the Bolton Master Builders' Association has just been held at the offices, Chancery Lane, Bolton. In the absence of the president, Mr. Wm. Lee, through illness, Mr. J. H. Marsden was called to the chair. The committee's annual report, presented by the secretary, Mr. F. W. Briscoe, showed that the work of the past year had been very great, no fewer than fifty-three meetings of the committee and branches having been held. The report stated that the benefits of the Association had been abundantly manifested. It expressed the hope that special efforts would be made so as to insure the delegates of the Master Builders' Association of Great Britain an interesting meeting and hearty greeting on the occasion of their visit to Bolton at the half-yearly meeting to be held in July next.

FUNDS are being raised for St. Mary's Church, Shrewsbury. The spire, which was being repaired, was unable to resist the violence of the late gale, gave way, and precipitated itself into the church. The entire nave roof, which was of exceptional interest, has been demolished, but the windows have escaped. St. Mary's is one of the finest churches in Shropshire, and the oldest in Shrewsbury, its foundation going back to 980. The spire, as distinct from the tower, was of unusual height, and ranked third among English spires.

ILLUSTRATIONS.

ASCOTT, BUCKS.

ASCOTT, BUCKS: FROM ROSE GARDEN.

GALATEA.

TRADE NOTES.

MR. W. F. NEEDHAM, of Branstons Street Works, Birmingham, has recently brought into prominent notice some of the uses for decorative purposes to which specially prepared and varnished split bamboo can be applied, especially on dados, friezes, walls and ceilings, as illustrated in our advertising columns of this number. It is undoubtedly very attractive, requires no great skill in fixing, and is also economical as to cost. It is in lengths of 6½ feet, the diameter varying from ¾ inch to 2½ inch. Mr. Needham's catalogue and price-list, we may add, will well repay the trouble of examining the illustrations.

THE annual meeting of the Bath Stone Firms, Ltd., has just been held at the Grand Pump Hotel, Bath. The twelfth half-yearly report was submitted, which recommended payment of a dividend of 8¼ per cent. for the past half-year, making 7½ per cent. for the whole year. Mr. J. C. Pictor, the chairman, in moving the adoption of the report and accounts, said it was the most satisfactory of any presented. The dividend for the last half-year of 1893 of 8¼ per cent. made the dividend for that year 7½ per cent., which was seven-eighths per cent. more than was paid in 1892, and half per cent. more than the highest dividend paid since the establishment of the company. The directors had only divided *bona fide* profits actually earned, and the increase was due to larger sales and to income derived from invested capital. The report was adopted.

THERE is a branch of skilled artifice that is limited to comparatively few firms, for it requires different treatment altogether from mere design and workmanship. The knowledge of religious symbols and their technique is absolutely essential in work of the kind. We recently had the opportunity of inspecting the art workshops of Mr. Walter V. Evans, of 140 Clerkenwell Road, E.C., entirely devoted to ecclesiastical work. Mr. Evans is himself a practical workman and designer, and has been responsible for some of the best memorial and general metal-work that has adorned our churches.

THE INCANDESCENT GAS LIGHT

(WELSBACH SYSTEM).

One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of 3½ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.	SIEMENS' BURNERS, 23 calories per candle per hour.
ARGAND " 44 " " " " " "	WELSBACH " 10 " " " " " "

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS LIGHT CO., LIM.,
14 Palmer Street, Westminster, London.

We inspected some beautiful specimens of work, massive, imposing, and some exquisitely delicate, in all the different shades of metal—silver, electroplate, brass, copper and iron. Mr. Evans will be glad to submit specimens of work to any of our readers interested in church decoration.

THE tender of Messrs. Armitage & Hodgson, of Leeds, for building offices at Wakefield for the West Riding County Council is recommended for acceptance, the cost being about 77,000*l.*

THOSE interested in good casters for furniture are afforded, by Mr. Henry Beckett Harding, the inventor, patentee and manufacturer of "Harding's Patent Globe Casters," an opportunity of seeing and testing them at Nos. 19 and 21 Bury Street, Bloomsbury. We have before this explained the advantages and principles of the globe casters.

THE works committee of the School Board for London have just passed the following resolution with regard to the employment of registered plumbers:—"That it is desirable that plumbers employed by the Board should hold a certificate of the Plumbers' Company."

THE new infectious hospital buildings, Cardiff, which are now nearing completion, are being warmed and ventilated throughout by means of Shorland's patent system. In each of the large wards are fixed one of Shorland's patent double-fronted Manchester stoves with descending smoke flues, and in each of the smaller wards one of Shorland's patent Manchester grates. The whole of the hospital buildings are ventilated by means of Shorland's patent exhaust roof ventilators and vertical inlet tubes, the work being carried out by Messrs E. H. Shorland & Brother, of Manchester.

A FINE piece of wrought-iron screen-work, designed by Mr. Pearson as a side screen for the choir of Peterborough Cathedral, has just been completed. The screen is treated very simply, with upright parallel bars filled in with rich scroll-work in the lower portion up to about the level of the eye, and with narrower band of similar work along the top, also with a fine cresting and frieze. The scroll-work is simple in detail but designed in the true spirit of Mediæval wrought-iron work, and is very effective *en masse*. This excellent piece of workmanship has been produced at the forges of Messrs. White & Sons, Oxford Street, London.

THE Holland (Lincolnshire) County Council, at Spalding yesterday, accepted a contract for the supply of 6,000 tons of granite from a Belgian firm.

TENDERS have been submitted to the Clerkenwell Vestry for building the new Parochial Hall. The original estimate was 12,000*l.*, but the Vestry decided to increase this estimate by 910*l.* extra cost involved by paying the trade-union rate of wages, and also for using English goods throughout instead of allowing the use of foreign manufactured goods. Nine contractors tendered for the work, and Messrs C. Dearing & Son, of Islington, were successful, with 14,724*l.* 18*s.* Mr. Evans Vaughan, of the Lowther Arcade, is the architect.

ELECTRICAL.

AT the meeting of the electric-lighting committee of the Edinburgh Town Council, the following were selected to be recommended to the Town Council from among ninety-eight applicants for the post of electrician to the Corporation:—Mr. R. A. Chattock, Metropolitan Electric Supply Company, Limited, Amberley Road Station, London; Mr. George B. Dunn, Metropolitan Electric Supply Company, Sardinia Street Station; Mr. E. W. Monkhouse, M.A., Westminster Electric Supply Corporation, Limited, Eccleston Street, Falkirk.

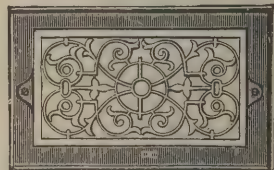
AT the meeting of the Stafford Town Council, it was reported that a letter had been received from the Local Government Board giving their formal sanction to the borrowing of 20,000*l.* by the Corporation for a term of twenty-five years, and to the use of certain land at the gas works for the purpose of electric lighting.

THE Local Government Board have sanctioned an application of the Wolverhampton Town Council to borrow 30,000*l.* to carry out the electric-lighting scheme.

AT a general meeting of the Northern Society of Electrical Engineers, held at the Palatine Hotel, Manchester, two papers were read—one on "Notes on designing a system of underground electric mains," by Mr. John H. Rider; and the other on "The various systems of underground mains, and the methods of laying the same," by Mr. S. V. Clirehugh.

SOME additional works have been rendered necessary on the eastern arm of the new harbour at Dover, through geological "faults" discovered in the sea bed, which will entail an estimated further expenditure of 30,000*l.* on this section of the operations.

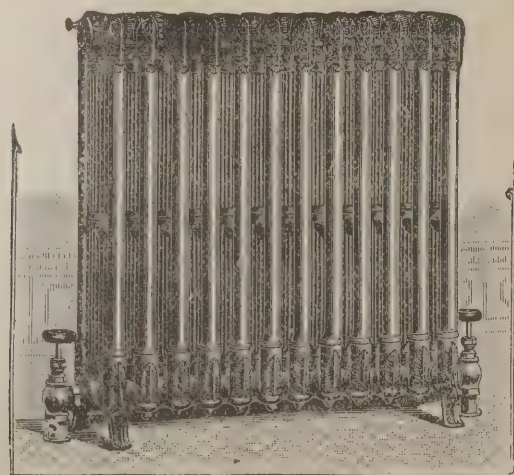
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MICA FLAP VENTILATORS.

COMYN CHING & CO., Ventilating Engineers,
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H. MUNZING,
American Merchant,
199 UPPER THAMES ST., LONDON.

Architects should specify for the new Triple-Pipe "UNION," "ROYAL UNION," and "CHAMPION UNION" patterns DIRECT RADIATORS, giving more easy, uniform and positive circulation of Water or Steam; also Walworth's Patent Wrought Tube Steam Radiators.

The Largest Stock of American Steam and Water Fittings, Valves, Tools, &c. &c.

PROOF IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE TOILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1*s.* each. Free by post, carefully packed in patent roller, 2*s.* 3*d.*—GILBERT WOOD & CO., 175 STRAND, LONDON, W.C.

VARIETIES.

AN inquiry has been held by the Local Government Board into the application of the Gainsborough authorities for sanction to borrow 600*l.* for the improvement of their public baths, and 600*l.* for works of private street improvement. There was no opposition. The Inspector strongly advocated washhouses in addition to baths.

THE Mersey Dock Board have under consideration a proposal to raise the quay of the north side of the Egerton Dock, Birkenhead, and to erect a corrugated iron shed, at a cost of 13,350*l.*, and to raise a portion of the quay on the north side of the Hornby Dock, and erect a shed 900 feet long and 150 wide, at an estimated cost of 51,500*l.*

THE Mile End Board of Guardians have entered into a contract for the purchase of several acres of land at North Weald, Essex, on which to erect cottage homes for between 300 and 400 children. Each home will accommodate twenty-five children, and will be in charge of a foster-father and foster-mother. The boys will be taught shoemaking, carpentering and tailoring, and will work on the land.

THE Greenock Harbour Trust have agreed to grant to an oil company a ten-years' lease of two acres of ground at the James Watt Dock at 200*l.* per year. The Harbour Trust also agreed to expend 4,500*l.* on the erection of a jetty, tanks, stores, cooorage and other buildings, if the company gives a guarantee that no less a quantity than 20,000 tons would be imported each year during their lease.

AT Bracknell an inquiry has been held by the Local Government Board to consider an application for a provisional order to purchase 22½ acres of land for sewage disposal works. Arrangements had been made by the Authority with the owners of the two pieces of land required. The agreements were not signed, and the inquiry was held as a matter of form. Mr. W. H. Radford, of Nottingham, engineer to the scheme, attended. The sewage is to be purified by irrigation, two pumping stations being necessary, one at each end of the town.

THE corporation of the Port Works of Barcelona have issued a circular giving the conditions upon which tenders will be received in that town, up to April 16 next, for the construction of a floating dock (Clarke and Stanfield system) for the harbour of Barcelona. Copies of this circular (in Spanish), together with a plan of the proposed dock, may be seen on

application to the Commercial Department of the Foreign Office between the hours of eleven and five.

AN inquiry was held on the 1st inst. by Mr. John Bird Clarke, for the Local Government Board, into an application by the Barnoldswick Local Board to borrow a loan for works of sewerage and sewage disposal. Dr. Holt, of the firm of Messrs. Brierley & Holt, engineers, explained the scheme. There was no opposition to the scheme, and the inquiry terminated in the usual manner.

THE district committee of the Kingussie County Council have decided at once to advertise for estimates for the construction of an iron bridge across the Spey, below Kingussie, to replace the existing timber structure. The design prepared by Mr. A. Mackenzie, the district surveyor, shows a structure of three spans, each of 74 feet, with stone piers and neatly-chiselled pilasters. The piers are to be sunk on cast-iron cylinders, which will reach about 14 feet below the bed of the river.

AT the meeting of the Shropshire County Council forty-five applications were received for the post of divisional surveyor at a salary of 150*l.* Mr. J. Forster, Nottingham, was elected.

THE *Standard* says:—The most important portion of the great works at the Iron Gates, the cutting through the rocks of a navigable canal from the Servian to the Roumanian bank of the Danube, is reported to have been completed on Tuesday by the engineers of the Hungarian Government. The canal is 2,840 mètres long, 80 mètres wide and 3 mètres deep, thus allowing for the passage of medium-sized sea-going ships. The quantity of rock blasted was 360,000 cubic mètres. The water will not be let in before the rest of the works, of which this canal was the most difficult part, are finished.

THE managers of the Metropolitan Asylums Board have adopted plans for the erection of the Brook Hospital at Shooter's Hill, at an estimated cost of about 195,000*l.*

A "DAMNUM FATALE."

AN action was recently taken against the Caledonian Railway Company by Colonel Kidston and Mr. R. M'Clure, in which they claimed 3,000*l.* for damage to property in Glasgow. The plaintiffs are joint proprietors of houses in Stevenson Street and Tobago Street, Calton, Glasgow, which are occupied by tenants as shops and dwelling-houses. The railway company are constructing an underground railway from Dalmarnock to

GEORGE SMITH & CO.,

Builders and Contractors,

SAWING, PLANING, MOULDING and VENEER MILLS,

GROSVENOR CANAL, COMMERCIAL ROAD, PIMLICO,

LONDON, S.W.

HIGH-CLASS

JOINERY

OF ALL KINDS.

MASONRY OF EVERY DESCRIPTION.

SOLE AGENTS FOR GUITING STONE.

Maryhill, with branches, and diverted the main sewer. In connection with these operations they opened a trench along the edge of the footpath opposite the plaintiffs' property. On August 23, 1892, while the trench was open, there was a heavy fall of rain, which loosened the soil and caused a subsidence, the result being that the property was damaged. The loss, injury and damages they stated to be 3,000*l.*, made up of cost of removing the buildings in terms of order of the Dean of Guild Court, cost of re-erection, loss of rental, claims of damages at the instance of tenants, and expenses. The company denied that their operations for the construction of a sewer opposite the property were carried on in an unskilful and negligent manner, in consequence of which the pursuers' property was injured. They also pleaded *damnum fatale*. The case was tried before Lord Low, when the jury returned a unanimous verdict for the plaintiffs, and fixed the damages at 1,542*l.* 6*s.* 8*d.* The company applied for a new trial.

The Court granted the application.

Lord Low said his opinion was that the verdict was contrary to the evidence, and that opinion had been confirmed by the argument their lordships had heard. The company had adopted the best known method of carrying out a work of this sort, and although there was room for some difference of opinion as to whether some better method might not have been adopted, it was impossible to say that men of skill who honestly and after consideration employed it were guilty of negligence or want of reasonable skill. His lordship thought it proved that ordinary precautions were taken to guard against flooding by ordinary rainfall; but that the rainfall which occurred on August 23 was so exceptional and extraordinary that it was of the nature of a *damnum fatale*, which the defenders were not bound to guard against.

AN EDINBURGH FLOUR MILL.

ON Saturday, the 10th inst., the members of the Edinburgh Architectural Association paid a visit to the Chancelot Roller Flour Mill, Bonnington. The president of the Association (Mr. W. W. Robertson) referred to the death of the architect, Mr. James Simpson, who, it had been expected, would have conducted the party over the works, and introduced Mr. George Simpson, who was to conduct the company. Mr. Simpson explained that the extensive premises were being built not only for, but by, the Scottish Wholesale Co-operative Society, under their master of works, Mr. Davidson, the

Society employing the workmen direct and buying the materials, and making no contracts except in respect of the supply of machinery, ironwork and such like, and that the buildings had been brought very near completion within the short space of two years. The whole buildings were inspected, and the processes were explained by which the grain is converted into flour without the intervention of manual labour at a single point from the time when the grain is tipped out of the railway waggons to the time when the flour is stored in sacks in the warehouse. It was mentioned incidentally that by the new processes the danger of fire from the accidental ignition of the fine flour dust is obviated, as from first to last the flour at every stage is confined within the machines, shafts and elevators, and entirely prevented from coming in contact with the atmosphere of the apartments. Notwithstanding this the mill is fitted up with automatic sprinklers, especial attention being given to the tops of the elevators, where a temperature of 130 degrees brings them into action, causing a sudden down rush of a large volume of water. Before the visitors left the President expressed their thanks to the directors for their permission to visit the mill.

THE MOREAU-RAE MARBLE.

AT the invitation of the chairman and directors of the Marble (Moreau-Rae) Syndicate, Limited, a large number of architects and others were present on Wednesday, the 14th inst., at the works situated in Lots Road, King's Road, Chelsea, for the purpose of witnessing the interesting process whereby limestone is converted into marble in a very short space of time, and yet in accordance with nature's method. The demonstrations afforded were closely observed by those present, who were much impressed therewith, and the expressions of satisfaction were pretty general.

Any kind of limestone, we understand, forms a suitable basis for the process, although a soft stone is preferred for work of an ornamental character, such as is obtainable from the quarries of Poitou and Angoulême, while for plain slabs and columns a harder stone is preferred, especially a kind procurable from Marseilles, which contains a good deal of "shell" or flint, and is capable of being made to yield very fine results, but it is to be hoped that English stone will be largely employed.

The limestone selected to be operated upon is first of all



Manufacturers of Wrought Metal Work, Architectural Carving and Joinery for Ecclesiastical Purposes, Domestic and Public Buildings, Lighting Appliances, &c.

Estimates given to Architects' own designs. Work can be inspected during execution.

Showrooms:—79 Edmund Street, BIRMINGHAM; 43 Great Russell Street, LONDON, W.C.;

WORKS:—Eagle Works, Hornsey, N.; Porchester Street, Birmingham.

LIGHTNING CONDUCTORS

IN PATENT COPPER ROPE OR TAPE.

NEWALL'S CONDUCTORS

Are the most reliable, most effective, and cheapest offered to the public.

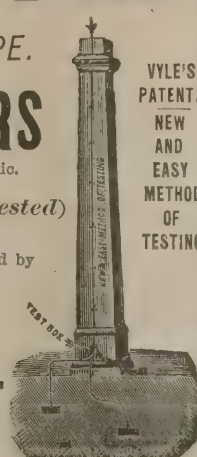
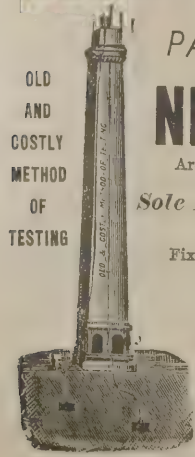
Sole Manufacturers of Vyle's Patent (Easily Tested) Lightning Conductors.

Fixed complete by experienced workmen and their efficiency tested by competent electricians.

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R. S. NEWALL & CO., LD.

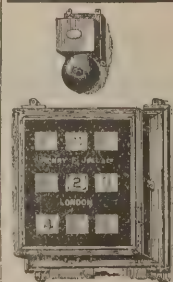
30 GREAT ST. HELEN'S, E.C.,
& 130 STRAND, LONDON, W.C.



ELECTRIC AND PNEUMATIC BELLS

Lightning Conductors, TELEPHONES, SPEAKING TUBES, TELEGRAPH LINES, &c. Estimates Free.

HENRY F. JOEL & CO.
31 Wilson Street,
FINSBURY SQUARE
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NIGHTINGALE'S

EVER FIRM

Bevelled Wood Bloc Flooring.

REGD. No. 60,808.

Sole Proprietors:
NIGHTINGALE & CO.,
Gt. Grimsby.

SPECIALTY—
"Baltic"
Redwood.

Prize Medal,
Liverpool Exhibition,
1886; Awards
Sanitary Exhibitions,
1888 and 1889.



worked or carved into the required shape. It is then gently dipped in water, upon which varnish has been previously sprinkled, and so any variety of veinings are produced, and as the surface markings caused by the adherent varnish, which closely resemble those on ordinary marble, are impermeable, it follows that when the object is subsequently immersed in various baths of metallic solutions which penetrate the pores, excepting where the varnish adheres, a variety of patterns and shades of colour are induced as may be requisite. The stone takes up the solutions in the course of a few minutes, and then it is immersed in a bath of warm water, so as to become permeated to the centre with the colouring. After drying the object is placed in a bath of indurating solution, and the process is complete, so that what was simply limestone has become, to all intents and purposes, marble, only the metamorphosis, which nature requires ages to perform, is accomplished by the Moreau-Rae process in less than a week. The subsequent polishing is done in exactly the same manner as in the case of ordinary marble, while the cost of production is comparatively small, so that for decorative and other purposes there seems no reason why the Moreau-Rae marble should not be largely employed where the question of cost is paramount.

AUTOMATIC GAS AND WATER VALVE.

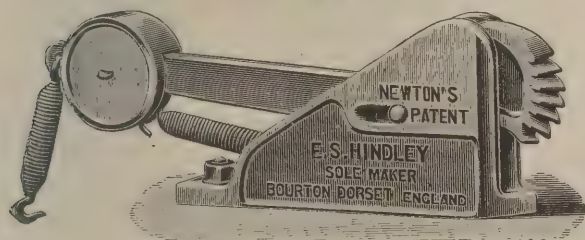
We have lately had the opportunity of inspecting at 51 Queen Victoria Street, E.C., a very ingenious and most useful appliance in the way of an automatic gas and water valve in connection with Maughan's patent geysers. This appliance is simplicity itself, and that perhaps accounts for no one having invented it earlier. The function of the appliance is to prevent any possibility of injury arising when the gas is alight and no water in the geyser. It acts under all circumstances, and is quite independent of all variations of pressure. The gas is shut off automatically immediately that the supply ceases, whatever the cause may be; the only condition under which the gas can be alight is absolutely that water must be flowing into the geyser. Any stoppage in the flow of water turns off the supply of gas. The principle, as before stated, is extremely simple, and so also is the construction; anything in the way of perishable material, complexity of arrangement is avoided, so that it cannot get out of order. It is certainly a great improvement on the previous interlocking gas and water taps which have been found so satisfactory. The Maughan's Patent Geyser Company,

Limited, have brought out several novelties, as may be seen from their last issued catalogue. One that is taking very well with the public is Maughan's patent geyser with improved mineral-oil burner, of which we give an illustration, for baths and domestic and general purposes, where gas cannot be obtained.



Another is a new geyser made of strong copper throughout. The gas check, which is now fitted to all the patent geysers, will be found a very great saving in time and trouble, in addition to securing the desired economy in consumption of gas.

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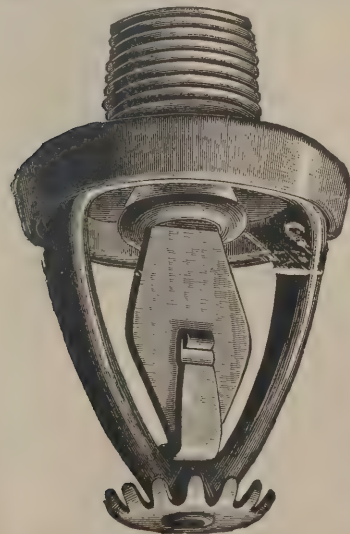
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'SPRINKLER, Closed.

JERRY BUILDING.

At the meeting of the Carlisle Architectural Association Mr. C. W. Hill gave an address entitled "The sins of the jerry builder and their effects on the public health." Mr. Hill commenced by defining the meaning of "jerry builder," and where and how he flourishes, and said his victims were, as a rule, the working man, who had saved enough money to buy a house of his own, and was led to believe that he was making a bargain by purchasing his dwelling from such a builder for a few pounds less than a proper house could really be built for. The lecturer pointed out many of the devices practised by the "jerry builder" to economise in the erection of a house, notably those of bad foundations, hollow walls filled in with earth or rubbish, hollow chimney-breasts causing smoky chimneys, no flashings to roof, wall plaster made of road sweepings, &c.; floors laid on the bare earth, and defective house drains, in which the ingenuity of the unscrupulous builder is seen to such advantage by the use of bad pipes and cheap fittings, &c. He emphasised the importance of efficient house drainage and plumbing to prevent the escape of sewer-gas, so conducive to illness, and said he was of opinion that not 10 per cent. of the drains laid up to ten years ago would now stand a proper test.

NATIONAL BUILDING TRADES EXHIBITION.

TO-DAY (Friday) is the opening day of a Building Trades Exhibition at the Royal Agricultural Hall, Islington, which may be expected to surpass anything of the kind hitherto witnessed as a Building Exhibition. A new series is thus inaugurated, under the management of Mr. W. R. Larkins. The list of names on the Consultative Council is, we may say, a guarantee of success, and that one of its objects, the development of business in connection with the building industries, will be secured. The following is the Council list so far:—Chas. Barry, F.S.A., F.R.I.B.A.; T. Chatfeild Clarke, F.R.I.B.A., &c.; Thos. De Courcy Meade, M.Inst.C.E.; Chas. Lynam, F.S.A., F.R.I.B.A.; J. Douglass Mathews, F.R.I.B.A., F.S.I.; Chas. J. Shoppee, F.R.I.B.A., President Surveyors' Institution; F. R. Farrow, F.R.I.B.A.; J. S. Phené, LL.D., F.S.A., F.G.S., F.R.I.B.A.; John Mowlem Burt (John Mowlem & Co.), Master of Loriners' Company; H. H. Bartlett (Perry & Co.), past President Institute of Builders; T. Freeman, F.G.S., F.S.S., Warden Shipwrights' Company; Lasenby Liberty (Liberty & Co.), Master of Glass Sellers' Company;

Owen A. Ellis (Ellis, Partridge & Co.); Thos. Minton, J.P. (Mintons, Limited); Edmund A. Pontifex, M.Inst.C.E., Master of Armourers' and Brasiers' Company; Pearse Morrison, Master of Blacksmiths' Company; Gilbert Wood, F.R.C.S. (Gilbert Wood & Co., 175 Strand); H. Greville Montgomery, "The British Clay Worker and Potter," 222 Strand, W.C.; Banister Fletcher, J.P., D.L., F.R.I.B.A.; Lewis H. Isaacs, F.R.I.B.A.; John E. Sears, F.R.I.B.A.; Tom F. Rider, Master of Tylers' and Bricklayers' Company; Lewis Angell, M.Inst.C.E., borough engineer, Stratford; Wm. Nisbet Blair, C.E., borough engineer and surveyor, St. Pancras. Hon. sec., T. Freeman, 202 Phoenix Street, N.W. Ingenious novelties and general attractiveness will no doubt contribute to draw all interested in building matters. One agreeable change in the arrangement of the exhibits is that they will now come under different sections, and visitors will see by a glance at the catalogue exactly where to find what they want to see. We notice the following prominent firms are represented:—The Coalbrookdale Company, Limited; Messrs. Yates, Heywood & Co.; the Shannon File Company, Limited; the St. Pancras Iron Company; the Carron Company, Limited; the Pickering Hoist Company; Messrs. Shanks & Co.; Messrs. F. Jones & Co.; the Incandescent Light Company, Limited; Mr. John Grundy; Messrs. Mintons, Limited; Messrs. Hayward Bros. & Eckstein; Messrs. Garstin & Son; Messrs. Humpherson & Co.; the Eagle Range Company; Messrs. Woollams & Co.; Messrs. Baird, Thompson & Co.; Messrs. Kirk & Dickenson; Mr. A. J. Angell; the Patent Victoria Stone Company, Limited; Messrs. Hartley & Sugden; the Fireproof Construction Company; Peace & Norquoy; the Paragon Bolt Company, Ltd., &c. These are the names only of a few of the exhibitors, and there can be no doubt that the exhibition will be of a thoroughly representative character. The promoters are endeavouring to revive the building trade, and have, as already mentioned, secured the patronage and active assistance of a council of the most eminent architects and supporters of the building industries. We trust that a liberal support will be given to this enterprise, which in every sense deserves success. We shall refer in detail in subsequent issues to all the most interesting exhibits.

Parkers, Limited.

This well-known firm in the Midlands have devoted themselves in a very exhaustive way to the construction of wood chimney-pieces which claim the special attention of architects, as each year shows a marked advance in artistic furniture, and makes

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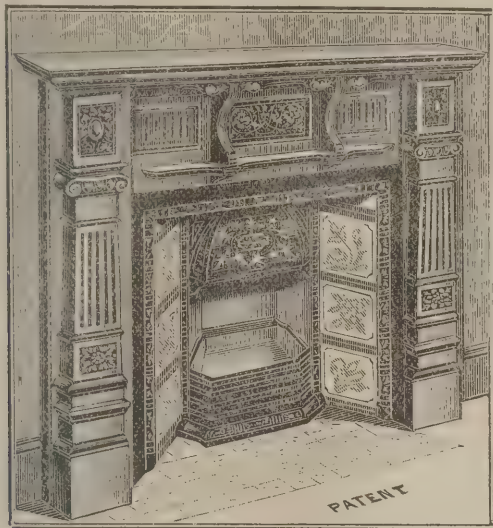
"Burton Weir" Tile Panels and Hearths.
"THE GOLD MEDAL RANGE,"

With Lifting Fire.

WORKS, ROTHERHAM. Estab. 1854.

the study of chimneypieces of great importance to both architects and builders who have the arranging of this most important feature in the room. The introduction of wood mantels which can be coloured in harmony with any of the other portions of the furniture, in lieu of the cold and cheerless marbles, appeals to the eye of the architect and decorator, and from a commercial and economic view they are equally valuable.

The mill, which has lately been added to and greatly enlarged, is equipped with the most modern and effective machinery to be found in this branch of business, and enables



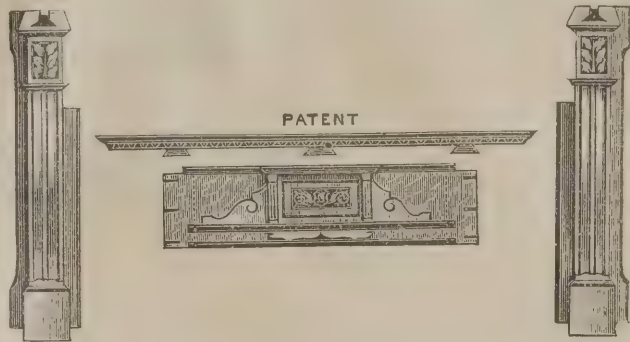
the firm to turn out at a very reasonable rate all kinds of finished woodwork, such as dados, doors, mantels and overmantels, and interior panelling and woodwork.

The wood used in the construction of the adjustable wood chimneypieces, which are protected by royal letters patent, and are a special and leading production of the firm, is of the very best quality, is fully matured and stacked for several years, and afterwards passed through their own patent drying stoves at a temperature of 125 deg. before use.

These chimneypieces will be on show at the Exhibition from March 16 to March 31, and we should recommend all interested in building and furnishing to go and inspect this important economic and indispensable patent.

The details of the construction of the adjustable chimneypieces are as follows, and which are found to be very simple, firm and effective:—

Separate jambs, as shown in a model, are formed with the frieze screwed at the special screws being used. The shelf is dovetailed into the top of the jambs and makes the chimneypiece substantial and firm, there being no mitres to give way, as all the mouldings on the frieze run at the back of the jambs. The sections on the face of the jambs are boxed and framed up. The mouldings are put horizontally on the vertical jambs and are returned in the solid and screwed from



the back. All the sections can be well and uniformly polished before being screwed together, and thus corners and recesses are equally finished as any other part. The most distinctive and advantageous feature in their construction lies in their being adjustable and interchangeable. Jambs, friezes and panels can be adapted at the pleasure of the architect or builder and changed in different rooms and to suit the special requirements of it, and the size of the chimneypiece can be enlarged or reduced as required by the space available to the extent of 5 or 6 inches, and marble slips or tiles can be introduced if desired, or to fit perfectly close to the grate.

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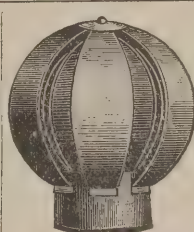
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Coalbrookdale Company, Limited.

The Coalbrookdale Company, Limited, Victoria Embankment, E.C., show a collection of fireplaces in cast-iron, consisting of mantelpieces and overmantels, grates and fenders *en suite*; a collection of dog-grates and interiors, from designs by the late

& Barton's patent), Cundy's patent, the "Century," the "Sabrina," and others, grilling stove, &c.; a collection of radiators, Heap's patent hydro-caloric and others, cast-iron baths, lavatory stands, &c.; a collection of Brosley tile goods of the well-known "Lighmoor" brand, made by patented machinery, also firebrick goods; a collection of electric-light fittings of various descriptions, in and out of use for the purpose of illumination, contributed by Mr. H. South, 10 Garrick Street, Covent Garden.

A. T. Angell.

Visitors should not miss seeing the exhibit of Mr. A. T. Angell. It is essential that a manhole shall be absolutely air-tight. Mr. A. T. Angell claims this special feature for his patent manhole cover, of which specimens may be seen at the exhibition. The illustration below shows how this advantage may be attained.



This cover, although removable, is locked and firmly fastened when closed.



Alfred Stevens, by Mr. R. Norman Shaw, R.A., Mr. Alfred Waterhouse, R.A., Mr. R. W. Lethaby, Mr. Faulkner Armitage, Mr. Basil Champneys, Mr. M. B. Adams, Mr. Scott-Morton, Colonel R. W. Edis, Mr. A. H. Mackmurdo, Messrs. Davis & Emmanuel, Mr. F. T. Pilkington, &c.; also Whitwell's patent ventilating grate, Parker's patent "Kyrle" grate for anthracite; a collection of gates and piers; railing for area and balcony, from designs by the late B. J. Talbert, by Mr. M. B. Adams, Mr. R. J. Haines, Mr. Lewis F. Day, &c.; a collection of staircase work, consisting of spiral staircase, lift enclosures in cast and wrought-iron, staircase railing, balusters, and newels in iron and bronze, from designs by Mr. F. T. Pilkington, Mr. B. J. Talbert, Mr. M. B. Adams, Messrs. Sulman & Hennings, Mr. J. J. Hibbett, Mr. R. J. Haines, &c.; a new adjustable fitting for balusters to handrail; a collection of kitchen ranges, comprising the "Circular" range (Richard

The flanges of the cover fall into specially prepared mastic composition, and are hermetically sealed. This arrangement is an effectual preventive of the escape of foul air, especially in hot weather, when the ordinary manhole cover becomes defective. Mr. A. T. Angell claims to be practically the originator of this improvement, and for twelve years his patent has met with great success. It is specified by the leading architects, and is to be found in the House of Commons, and the Board schools of London, Liverpool, and Manchester. Mr. A. T. Angell also exhibits Shoppee's patent non-slipping cover, the surface of which is corrugated, and admirably suited for heavy uses, stables, &c. Mr. Angell personally superintends the manufacture of every manhole cover sent out from his works, and will guarantee them absolutely air-tight. The visitor to the exhibition might with advantage give a call at the stand and see these points practically demonstrated.

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REACTIONS OF CARBON IN BLAST FURNACES.

AT a recent meeting of the South Staffordshire Institute of Iron and Steel Works Managers, held in Dudley, Mr. W. J. Hudson, of the Woodside Ironworks, read a paper entitled "Carbon Reactions in the Blast Furnace." He stated that never was the need of a knowledge of carbon and its compounds in the iron-smelting furnaces more clearly demonstrated than at the period when Neilson introduced the use of heated air for smelting purposes. The heating of the air produced at the time such wonderful and inexplicable results that the various attempts to elucidate them proved unsatisfactory. Percy expressed the opinion that hot-blast was a lucky hit rather than an invention, as Neilson did not appear to have so much anticipated a saving of fuel in the hot-blast furnace as the removal of some minor troubles, such as chilling at the nose of the tuyères, &c. Had he anticipated a saving of fuel, he could not, in the then existing chemical and physical knowledge, have expected to save more—if even as much—than the amount he expended in heating the air. They could scarcely imagine the intense surprise of Neilson and his friends when they found a saving in the furnace so greatly in excess of their expenditure. Iron-smelters in those days were not chemists, nor for many years later was that science considered of much, if any, value to them. Hence, for many years the real explanation of the several actions and changes wrought by the aid of hot-blast was wanting. Nor did the subject of the chemical actions occurring in the blast furnace receive serious attention until after further economy had been realised by successive enlargements of the capacity of furnaces in the Cleveland district, which increased from 48 feet to 55 feet in height, with a capacity not exceeding 7,000 cubic feet, in 1851, to 106 feet in height and 33,000 cubic feet capacity, and one 90 feet high, with the enormous and never exceeded capacity of 42,500 cubic feet, in 1870 and 1871. The remarkable economy due to increased capacity set many minds to work, and about the year 1868 they first began to realise the immense value of chemical and physical knowledge to the iron-smelter. Since that year they had been taught the major portion of what they now knew of the many intricate actions and reactions which go to make up the science of iron-smelting. Even now there was much to learn and much to settle. There were many divergencies of opinion as to how certain actions and reactions were brought about, and the ultimate effect or result of such reactions upon the economy and productive

power of the blast furnaces. Broadly speaking, heating of the air and the enlargement of the cubic capacity of furnaces had the effect of reducing the quantity of coke or carbon necessary to make a ton of pig-iron, by altering the conditions in the upper regions of the furnace in such a manner that the iron ore was enabled to undergo a much longer period of exposure to the action of carbon monoxide at a lower temperature than existed either in a furnace of small dimensions or in one blown with cold air. The keynote of economic smelting was to deoxidise the ore by means of carbon monoxide at a temperature too low to permit of any of the carbon dioxide then formed being reduced again to the lower oxide. In concluding the paper, in which technicalities were mostly dealt with, the writer observed that it was evidently of the highest importance to secure complete calcination of the ores when they were of the carbonate variety, such as Cleveland ore or the native mine of South Staffordshire. For every unit of carbon (of dioxide) remaining unremoved from the ore another unit of carbon might have to be removed from the fuel, thereby increasing a preventable waste.

Mr. C. R. Wright pointed out that in all probability the deposition of carbon was closely connected with the temporary formation of some form of carbonyl, which partly breaks up into oxide of iron and free carbon at certain temperatures. This, however, was little more than a speculation, without any very definite proofs. Mr. T. Roberts, the chairman, said that, according to the remarks of Sir Lothian Bell in a recent paper he had written, the size of furnace giving the best results was about 11,500 cubic feet. That furnaces of medium cubic capacity were capable, under certain conditions, of producing equally as efficient results as those of much larger capacity was amply proved by the fact that in America furnaces of 25,000 cubic feet were made to produce as much as 3,000 tons of iron per week; whilst in Cleveland, where the cubic capacity of the furnaces was as much as 33,000 feet, the average yield was only about 800 tons per week. In addition, the fuel consumption in America was about 3 cwt. less per ton of iron, as compared with Cleveland. Of course, the difference in the quality of the ore obtainable in the two countries accounted in a great measure for this disparity, but not altogether, as was shown by the fact that the Dowlais Iron Company, of Cardiff, could produce better results with the same economy of fuel, with a furnace of 25,000 cubic feet capacity, than was obtained in Cleveland with furnaces of 30,000 cubic feet. It appeared to him that the manufacturers of the Middlesbrough district,

LYCEUM THEATRE.

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When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4½ brickwork partition walls. The thickness from face to face is only 3 inches, thus saving enormously in weight and space.

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

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much as they prided themselves on being foremost in the iron and steel making industries, were too much wrapped up in formulas and scientific attainments, and did not pay sufficient attention to acquiring that practical knowledge which would enable them to get the most economical driving out of their furnaces.

STRAND IMPROVEMENTS.

THE highways committee of the London County Council have drawn up a report with reference to the widening of the Strand and Wellington Street, in which they state that they have ascertained that the property required for setting back the western side of Wellington Street to the line of Lancaster Place, and for rounding the corner at the junction with the Strand, is the freehold of the Duchy of Lancaster, and that most of the leases will fall in at Christmas, 1896. By adding the land to the public way the width of Wellington Street between the Strand and Lancaster Place would be increased to about 100 feet, and the Strand between Wellington Street and Savoy Street would be at least 80 feet wide. The price asked by the Duchy is 32,000*l.* The estimated cost of the paving works is 2,700*l.* Having regard to the very favourable opportunity now presented for effecting this much-needed improvement at the least possible cost, the committee recommend the Council to accept the terms of the Duchy of Lancaster and carry out the improvements suggested.

SOCIETIES' SECURITIES.

A PAPER on "Building Societies and their Securities" was read by Mr. J. Lindsey Johnson before the members of the Auctioneers' Institute, at their rooms, 57 Chancery Lane, last week. Mr. G. Brinsley, president, occupied the chair. Mr. Johnson said he was against embarking the money of poor people in large undertakings, such as the residential flats that were becoming so popular. The fashion might change, and when the residential flats were empty to any extent the so-called securities would be worth nothing. It was, however, entirely different with freehold houses, land and good leasehold securities, where the ground-rent was five and six times covered by the rack-rent, because if these were held as securities for two-thirds of the selling value after the usual and necessary deductions, no society could go far wrong. He

contended that the directors of a property company ought not to advance upon or purchase the leasehold interest, except at a knock-down price, in a property where the ground-rent was only one and a half or twice covered. He drew three lessons from the events of the past eighteen months. First, no society that lent money upon securities as second or third charges was doing safe business; secondly, no balance-sheet should be deemed satisfactory unless audited by an independent firm of accountants, and directors should make affidavit that they had closely examined all the deeds relating to mortgages and securities; and, lastly, the position of directors and their ability for the due performance of their duties needed much more attention from investors.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 4068. Albert Cope, for "Improvements in or relating to sash windows."
- 4084. Johann Franz, for "Improvements in spring or weight-actuated blowers or ventilators."
- 4107. George Maule Marchant, for "Improvements in safety-valves for domestic boilers."
- 4173. William Cook, for "Improvements in ventilating-shafts for sewers and for other purposes."
- 4175. Cornelius Birkery & Hubert K. Wood, for "Improvements in ball-cocks."
- 4187. Douglass Commerell Menzies Fitzmaurice, for "Improvements in taps."
- 4192. Harvey Hallock Burritt, for "Improvements in valves."
- 4205. William Anderson, for "A valve."
- 4377. Robert Astley, for "Improvements in the construction of fireproof floors."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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THE Architect and Contract Reporter.

SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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For Two Lines and under (eight words to the line)	£	0	2	6			
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Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

TENDERS, ETC.

* * *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

COMPETITIONS OPEN.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GILLINGHAM.—April 6.—Alternative Designs are invited for a School in Three Departments. Mr. E. T. Atchison, Local Board Offices, Gillingham, Kent.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

LONDONDERRY.—May 1.—Plans are invited for proposed Baths and Washhouses. Mr. Robert N. Chambers, Guildhall, Londonderry.

ROTHERHAM.—March 25.—Schemes are invited for dealing with the Disposal of Sewage for the Borough. Premiums of 150l. and 50l., premium to merge. Mr. H. H. Hicknott, Town Clerk.

CONTRACTS OPEN.

ABERGAVENNY.—March 29.—For Building Stabling, Cartsheds, Workshop and other Works. Mr. J. Haigh, Town Surveyor, Abergavenny.

BANSTEAD.—March 29.—For Erection of a Band-room at the Public Schools. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

BECCLES.—March 31.—For Erection of a Tank for Gas-holder and Retort House, and a Building for the Governor. Mr. C. F. Parker, Gas and Water Company, Beccles.

BELFAST.—March 23.—For Alterations, Imperial Hotel. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BOTTOM, DORSET.—March 27.—For Erection of Five Dwelling-houses. Office of Works Department, 21 Craven Street.

BRIGHTON.—March 29.—For Constructing a Concrete Groyne, Storm-water Outlet, and an Overflow Chamber on the Beach, opposite Western Street; for Constructing a Storm-water Outlet and Making Additions to the Existing Groyne on the Beach opposite the Old Steine; for Constructing about 980 Yards of Brick Sewers, 8 Feet in Diameter, 562 Yards of Brick Sewers of Smaller Dimensions, and certain Pipe Sewers. Mr. Francis J. C. May, C.E., Town Hall, Brighton.

BURNLEY.—March 27.—For Building Three Police Stations The Borough Surveyor.

BURTON-ON-TRENT.—April 5.—For Building Infectious Diseases Hospital. The Borough Surveyor.

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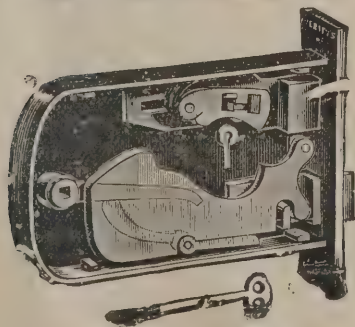
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CATALOGUES FREE BY POST.



CARDIFF.—April 11.—For Building Head Post Office. The Secretary, H. M. Office of Works, 12 Whitehall Place, S.W.

CHESHUNT.—March 26.—For Construction of about 3,200 Yards of Sewers. Mr. Samuel Towlson, Turner's Hill, Cheshunt.

CROYDON.—April 3.—For Supply of 13,000 Feet of Norway Granite Kerb and 100 Tons of Norway Granite Setts. Mr. W. Powell, 8 Catherine Street, Croydon.

DERBY.—March 29.—For Building County Council Offices. The County Surveyor.

ESHER.—April 4.—For Erection of Five Cottages and Building Additions to the Sewerage Works. Mr. James Edgell, Gate House, Portsmouth Road, Kingston-on-Thames.

GLASTONBURY.—March 30.—For Erection of Police Buildings. The County Surveyor, 1 Belmont, Bath.

HAVERIGG.—March 24.—For Building Parsonage. Mr. A. E. Bradley, 15 Horn Hill, Millom.

HENDON.—April 2.—For Construction of about 940 Yards of Tar Pavement, with Kerb, &c., at Redhill, Edgware. Mr. F. J. Seabrook, Edgware.

ISLINGTON.—April 2.—For Paving with Creosoted Deal Blocks a portion of Holloway Road, and Paving a portion of Grove Road with Granite Setts removed from Holloway Road. Mr. W. F. Dewey, Vestry Offices, Upper Street, N.

KETTERING.—March 24.—For Building Board School. Messrs. Gotch & Saunders, Architects, George Street, Kettering.

LEICESTER.—April 3.—For Preparing the Site, the Construction of a Concrete, Puddle and Earthen Dam or Embankment for a Storage Reservoir to contain about 500,000,000 Gallons and for Road Diversions, the Tunnel Outlet and Valve Tower and Valve House in connection with the Swithland Reservoir. Mr. J. Beverard, M.I.C.E., 6 Millstone Lane, Leicester.

LINTHWAITE.—March 27.—For Alterations to Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

LUDGVAN, CORNWALL.—March 26.—For Rebuilding and Alterations at and Additions to Commercial Hotel. Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Architect, Penzance.

MALMESBURY.—March 24.—For Construction of Brick Gasholder Tank. Mr. James A. Jones, Malmesbury.

MANCHESTER.—April 4.—For Building Inland Revenue Office. H.M. Office of Works, 12 Whitehall Place, S.W.

MIDDLESEX.—March 26.—For Supply of 3,000 Cubic Yards of Hand-broken Granite. Mr. F. H. Pownall, Guildhall, Westminster.

MILE END.—March 28.—For Erection of a Mortuary. Mr. William Jutsum, Vestry Hall, Bancroft Road, E.

MILLBROOK.—April 2.—For Building Board School, House, &c. Mr. A. F. Gutteridge, Architect, 9 Portland Street, Southampton.

MORLEY.—March 29.—For Building Shop and Eight Houses. Mr. G. B. Clegg, Architect, Morley.

NEATH.—April 2.—For Alterations to Board School. Mr. T. C. Wakeling, Architect, Merthyr.

NOTTING HILL.—March 28.—For Painting, Colouring and Cleansing Works, Repairs and Alterations at the Parish Infirmary. Mr. E. J. Rossiter, Guardians' Offices, Northumberland Street, Marylebone Road, W.

RAMSGATE HARBOUR.—March 31.—For Erection of a Wooden Landing-stage at East Pier Head. Mr. C. Cecil Trevor, Board of Trade and Harbour Department.

ROMFORD.—March 28.—For Reparation of Church Tower. Mr. Fred. Chancellor, Chelmsford.

ROMFORD.—March 31.—For Supplying, Laying and Fixing Paving, Kerbing and Channelling in the Romford Market, and for Supplying, Laying and Fixing Paving and Kerbing in various Roads in the District. Mr. George Bailey, Romford.

ROMNEY MARSH.—March 30.—For Supply of 3,000 Yards of Rock for Dymchurch Sea Wall. Mr. Edward Case, New Hall, Dymchurch, Kent.

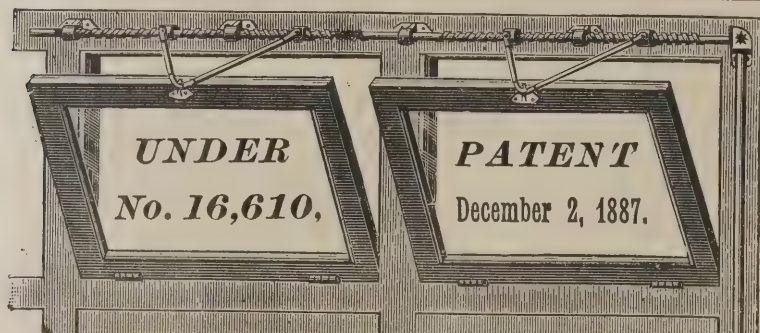
SHEFFIELD.—March 31.—For Excavation and Construction of Concrete and Brick Foundations for Proposed New Buildings, Liquor Tank, &c., at the Grimesthorpe Station of Sheffield Gas Light Company. Mr. Hanbury Thomas, Commercial Street, Sheffield.

SHEFFIELD.—March 31.—For Erection of a Boiler-house at the Neepsend Station of Sheffield Gas Light Company. Mr. Hanbury Thomas, Commercial Street, Sheffield.

SOUTHAMPTON.—March 29.—For Building Engineering Laboratory. The Borough Engineer.

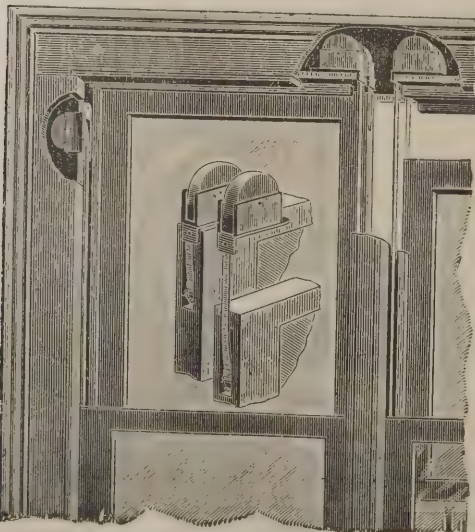
ST. JUST, CORNWALL.—March 23.—For Alterations and Additions to Pendeen Board Schools. Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Architect, Penzance.

TORQUAY.—March 27.—For Extension of the Existing Fish Quay by the Erection of about 300 Lineal Feet of Con-



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TOTTENHAM.—March 27.—For Supply of 500 Yards of Asphalte Paving. Mr. P. E. Murphy, Coombes Croft House, Tottenham.

TOTTENHAM.—March 27.—For Making-up Sutherland Road, Ida Road, Hartington Road, Roslyn Road, Burlington Road, Kemble Road, Etherley Road (part of), Eckington Road, Hampden Road (remainder). Mr. P. E. Murphy, 712 High Road, Tottenham.

TOTTENHAM.—March 27.—For the Supply and Delivery on the Works of about 1,150 Tons of 16-inch Cast-Iron Water Main, with all Necessary Bends, Valves, &c. Mr. P. E. Murphy, 712 High Road, Tottenham.

TOXTETH PARK.—March 27.—For Building Refuse Destructor Works. Mr. John Price, Engineer, Public Offices, Lark Lane, Toxteth Park.

WAR OFFICE.—April 1.—For Triennial Contracts for Repairs and Materials at the various District and Sub-District Stations. Mr. G. Lawson, War Office, Pall Mall.

WINCHESTER.—March 28.—For Construction of Bridges (Steel and Brickwork) over Canal. Mr. James Robinson, Engineer, 13 Southgate, Winchester.

WREXHAM.—March 31.—For Laying Down about 10,000 Yards of Tar or Asphalte Paving. Mr. J. W. M. Smith, Borough Surveyor.

TENDERS.

BEXHILL.

For Erection of Offices, Fire-engine Station, &c., for the Bexhill Local Board. Mr. HY. WARD, Architect, 8 Bank Buildings, Hastings.

A. H. White	£3,257	0	0
Moon & Garner	3,240	0	0
Taylor & Simmons	3,179	0	0
Snow	3,113	0	0
Jenkins	3,075	0	0
THOMAS (accepted)	3,044	0	0
Padgham & Hutchinson	3,030	0	0

BIRMINGHAM.

For Erection of New General Hospital, according to amended Plans. Mr. W. HENMAN, Architect. Quantities prepared jointly by Mr. T. H. MANSELL, Birmingham, and Mr. CHARLES HENMAN, London.

W. & J. Webb, Birmingham	£129,735	0	0
Parnell & Son, Rugby	125,154	0	0
Surman & Sons, Birmingham	123,990	0	0
Neil & Son, Manchester	123,920	0	0
Walker & Slater, Derby	122,541	0	0
H. Lovatt, Wolverhampton	121,891	0	0
Sapcote & Son, Birmingham	121,818	0	0
John Bowen, Birmingham	118,652	0	0
BARNLEY & SONS, Birmingham (accepted)	117,888	0	0

BRIGHTON.

For Construction of Swimming Bath, North Road. Mr. FRANCIS J. C. MAY, C.E., Engineer. Quantities by Engineer.

Playfair & Toole, Southampton	£6,348	0	0
V. N. Freeman, Brighton	6,336	0	0
Wilkinson Bros., Finsbury Park	6,107	0	0
W. A. Field & Co, Brighton	6,063	0	0
P. Peters, Horsham	6,057	0	0
Sattin & Evershed, Brighton	5,830	0	0
J. LONGLEY & Co., Crawley (accepted)	5,649	0	0
C. J. Slade, Maidstone	5,556	0	0

BRYNMAWR.

For Building Two Shops and Hotel in Beaufort Street, Brynmawr, for Mr. E. Pegler. Mr. EDWIN FOSTER, Architect, Abergavenny. Quantities supplied.

J. G. Thomas, Abergavenny	£3,125	0	0
Hatherly & Carr, Bristol	2,827	0	0
W. Lissaman, jun., Chipping Campden	2,750	0	0
D. C. Jones & Co., Gloucester	2,725	0	0
W. Bowers, Hereford	2,645	0	0
J. D. Williams, Knighton	2,550	0	0
T. S. FOSTER, Abergavenny (accepted)	2,495	0	0

GIPEY HILL.

For Underpinning and Alterations, &c., to a Pair of Semi-detached Villa Residences at Gipsy Hill, for Mr. Alexander Hicks. Messrs. RUSSELL & CROSIER, Surveyors, 22 Great James Street, Bedford Row, W.C.

MATTHEWS BROS., London (accepted)	£89	0	0
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Easily Managed Gas Light is desirable. Made in Five Sizes.

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CHATHAM.

For Building Technical Education Institute, High Street, Chatham. Mr. G. E. BOND, Architect. Quantities by Architect.

C. J. Slade, Maidstone	£3,944	0	0
T. Callund & Son, Rochester	3,530	0	0
J. G. Naylor & Son, Rochester	3,486	0	0
L. Seager, Sittingbourne	3,449	0	0
West Bros., Rochester	3,368	0	0
E. W. FILLEY, Chatham (accepted)	3,145	0	0

CHELMSFORD.

For Construction of Brick Reservoir and Erection of a Shed and Engine-house and Iron Balcony to Existing Water-tower in connection with Waterworks, Great Baddow. Mr. I. C. SMITH, Surveyor, Tindal Square, Chelmsford.

1.—Reservoir, Engine-house and Shed.

Drewry	£345	0	0
Potter	338	0	0
Kennell	337	0	0
Beckett Bros.	331	0	0
Parmenter	297	0	0
West	240	0	0
RAYNER (accepted)	235	10	0

2. Erection of a Balcony and the Painting of the Water Tower.
H. Young & Co. 260 0 0
Newton, Chambers & Co. 230 0 0
D. Rowell & Co. 230 0 0

Note.—Referred to committee.

HORSHAM.

For Additions and Alterations to the Infectious Wards of the Horsham Union Workhouse, including the Necessary Repairs to the Existing Building: Mr. C. H. BARSTOW, Architect, Horsham.

P. Peters, Horsham	£170	0	0
H. Rowland, Horsham	160	0	0
H. Murrell, Horsham	145	0	0
H. Holden, Horsham	139	10	0
G. Sharp, Horsham	138	5	0
Bennett Bros., Horsham	132	0	0
M. ETHERIDGE, Bishopric, Horsham (accepted)	124	18	0
Redford & Son, Horsham	106	10	0
Architect's estimate	147	0	0

GREAT WAKERING.

For Additions and Alterations to the Great Waking Board Schools, Essex, for the Waking U. D. School Board. Mr. WALTER J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend. Quantities by Messrs. BUSHELL & CROSIER, 22 Great James Street, Bedford Row, W.C.

G. Bulford, Leytonstone	£437	11	0
G. Burgess & Wiggins, Great Waking	356	15	3
G. Ventris, Great Waking	329	10	0
G. BURGESS & BAILEY, Great Waking (accepted)	325	19	0

LLANISHEN.

For Building Infants' Wing to Existing Schools, and Additions to Master's House at Llanishen, for the Rev. W. Dovey. Messrs. KEMPSON & FOWLER, Architects, 16 High Street, Cardiff.

W. Thomas & Co., Cardiff	£732	0	0
Williams Bros., Llanishen	699	5	4
Powell & Mansfield, Cardiff	647	0	0
W. Cox, Llandaff	643	0	0
COX & BARDO, Cardiff (accepted)	613	13	8

MARY TAVY.

For New Chancel Screen at Mary Tavy Church. Mr. E. SEDDING, Architect, Plymouth.

Hems	£500	0	0
Luscombe	450	0	0
Reade	370	0	0
R. PINWILL (accepted)	360	0	0

For New Transept at Mary Tavy Church. Mr. E. SEDDING, Architect, Plymouth.

P. Blowey	£315	0	0
W. TRIGGS (accepted)	295	0	0

NEWBURY.

For Contract No. 3, Sewage Disposal Works. Mr. E. A. STRICKLAND, Borough Surveyor.

A. Kellet, Willesden	£5,458	12	0
Tracey, Taunton	5,108	19	7
J. Dickson, Gray's Inn Road	4,911	15	8
S. Elliott, Newbury	4,902	17	0
G. Bell, Tottenham	4,367	0	0
E. C. James, Newbury	4,362	0	0
B. Cooke & Co, Battersea	4,274	0	0
G. ELMS, Benham, Newbury (accepted)	4,031	10	7

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T. Whur, Southend	£1,466	0	0
Baker & Wiseman, Southend	1,454	0	0
J. Gozzett, Maldon	1,450	0	0
Darke & Son, Southend	1,391	0	0
C. Orfeur, Colchester	1,390	0	0
F. Dupont, Southend	1,369	0	0

For Additions to House and Erection of Stables, Carlton Villa, Southend, Essex, for Dr. Waters. Mr. WALTER J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend. Quantities by Messrs. BUSHELL & CROSIER, 22 Great James Street, Bedford Row, W.C.

J. Gozzett, Maldon	£579	0	0
F. Woodhams, Southend	503	0	0
Darke & Son, Southend	497	0	0
F. DUPONT, Southend (accepted)	487	0	0

For Erection and Completion of a Detached Dwelling-house, Southend, Essex, for Mr. C. F. Woosnam. Mr. WALTER J. WOOD, Architect, 1 Finsbury Circus, E.C., and Southend. Quantities by Messrs. BUSHELL & CROSIER, 22 Great James Street, Bedford Row, W.C.

J. Gozzett, Maldon	£900	0	0
Darke & Son, Southend	867	0	0
Baker & Wiseman, Southend	832	0	0
F. Dupont, Southend	827	0	0
Alp & Ventris, Shoebury	773	0	0
F. Woodhams, Southend*	754	0	0

* Accepted with modifications.

WOOLWICH.

For Rebuilding the Premises at No. 54 Powis Street, Woolwich, S.E., for Mr. R. Martin. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 44 Norcott Road, Stoke Newington, N.

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H. L. Holloway	1,279	0	0
H. Brown	1,198	0	0
J. Chapman	1,185	0	0

WOOLWICH—continued.

For the Erection of a Dwelling-house in Samuel Street, Woolwich, for the Trustees of the late Mr. Henry Shersby. Mr. BERAIAH W. ADKIN, F.S.I., Architect, 14 Queen Street, Cheapside, E.C.

Wells & Sons	£490	0	0
John Bull	465	0	0
A. J. Fenn	450	0	0
GEO. CARTER (accepted)	375	0	0
J. W. Cuddington (withdrawn)	350	0	0

VARIETIES.

MESSRS. CROSBY LOCKWOOD & SON have issued their Price-book for this year. It forms a portly volume owing to the detailed character of the information. Especial attention has been given to the section relating to electric lighting. The new sanitary by-laws of the London County Council are given in full. Every year additional pains are taken to satisfy the requirements of the legion of supporters of "Lockwood." There are few who will not agree with the editor when he says:—"Building operations grow dearer year by year, without any corresponding benefit to any persons engaged therein; for it cannot be pretended that the workman is any gainer by the periodical strikes, even where these are successful, when the money lost by him during his enforced idleness while they are in operation is taken into account."

A SITE of five acres has been purchased at Clacton by the authorities of the Middlesex Hospital, with a view to the erection of a convalescent home. The home is to accommodate forty-five convalescents.

MR. RITCHIE, the manager of the Royal Aquarium, will present next week an astonishing variety of performances. There will be at least seventy "turns," a number that is unprecedented in stage history.

THE late Mr. Henry Boys, a leading brick manufacturer of Walsall, who died on Friday, leaving an estate of 100,000*l.*, has bequeathed nearly 20,000*l.* to charities. The Wolverhampton Orphan Asylum receives 7,500*l.*; some almshouses at Walsall, which Mr. Boys established, 4,000*l.*; Walsall Cottage Hospital, 2,000*l.*, &c. 3,500*l.* are to be invested for annual distribution of blankets and boots, and 1,000*l.* for a free Surgical Appliances Fund.

THE directors of the Glasgow and South-Western and Ci Union Railways are contemplating an extension of their line

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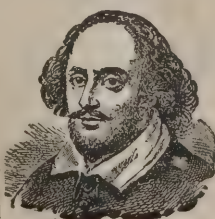
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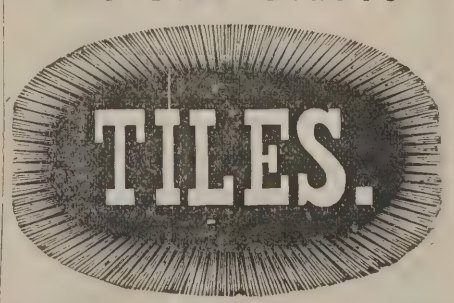
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in the city, involving the widening of the bridge which crosses the Clyde between the Stockwell and Albert Bridges. A sum of 100,000*l.* is mentioned as the estimated cost of the proposed works.

THE lords, bailiffs and jurats of Romney Marsh have further considered the report of Mr. Wolfe Barry and Mr. Matthews with regard to the Romney sea wall, the works recommended to make good the damage recently caused and to defend the marsh from inundation in future being estimated to cost 41,000*l.* Finally it was resolved to reconstruct that portion of the wall which has been practically destroyed on its seaward side on the old principle of a long sloping apron 180 feet wide at the base, constructed of rock paving bedded in concrete and pointed in cement; further, that thirteen groynes, running out from the wall to low-water mark, should be constructed at suitable distances.

A NEW turret Cambridge-quarter clock has this week been erected in St. Mary's parish church, showing the time on two large copper dials, by Messrs. Wm. Potts & Sons, clock manufacturers, Leeds, from instructions received from Mr. Wensley Hunton, solicitor, who is acting for the donor, Mrs. S. Bones, of Richmond.

THE Edinburgh Town Council have resolved to withhold their consent to the buildings in Princes Street between the Waverley steps and the North Bridge being raised to more than 60 feet in height above the level of the street, unless the railway company propose to take down the present buildings and rebuild them within five years from this date, according to a design to be approved by the corporation; and in the event of such a proposal being made, the matter to be again brought before the council for decision as to what increase in height, if any, shall be allowed and on what conditions.

BUILDING AND BUILDERS.

THE Halifax School Board have decided to borrow 7,500*l.* for the enlargement and furnishing of the higher school, and also to enlarge the Siddal school according to plans by Messrs. Horsfall & Williams.

THE London County Council have agreed to rebuild Lea Bridge at an estimated cost of 10,000*l.*, on condition that the Essex County Council contribute 4,250*l.*, the Lea Conservancy Board 500*l.*, and the Leyton and Walthamstow Tramways Company 1,000*l.* towards the cost.

INFANT schools, in connection with St. Lawrence's parish church, Longridge, near Preston, are to be erected as a memorial of the late Rev. F. A. Cave-Browne Cave, many years vicar of the parish.

THE EMPRESS FREDERICK AND PLUMBERS' WORK.

THE Empress Frederick, on the occasion of a lengthened visit last week to the plumbers' workshops at the Shoreditch Municipal Technical Schools, equipped by the Plumbers' Company, evinced much interest in the work of the plumbers' apprentices, and expressed her strong sense of the importance of securing sound workmanship in connection with plumbing arrangements.

The details of the students' work which was being executed during Her Majesty's visit were pointed out to the royal visitor by Mr. Quelch, operative plumber and sanitary inspector to the Shoreditch vestry, who is the teacher of the classes. Specimens of lead-work executed by operative plumbers in various parts of the kingdom were shown and their merits pointed out by Mr. G. B. Dav's, foreman plumber to Messrs. Jennings. Her Majesty asked many questions as to technical details, and seemed to quite understand the purpose for which the various appliances and pieces of work were intended.

Her Majesty seemed especially interested in the work of a little lad who was wiping a joint, and she was much surprised to learn the small charge made for instruction in plumbing. It was pointed out that the cost to the plumbing pupils was equal to 1*d.* per lesson of 2½ hours' duration, including the cost of material.

Mr. Philip Wilkinson, F.R.I.B.A., renter warden to the Plumbers' Company, explained the educational system for plumbers which is being carried out in various centres throughout the United Kingdom. Her Majesty inquired whether the plumbers were given instruction in the principles of hygiene, in order that they might be made acquainted with the serious consequences which would result to the public health from defects in plumbers' work. Mr. Wilkinson stated that the requisite instruction in hygiene is given in the plumbers' classes at King's College and elsewhere. Her Majesty desired to be informed of the future progress of the educational system.

THE Homacoustic Company, we hear, have removed to 6 Burton Street, New Bond Street, W.

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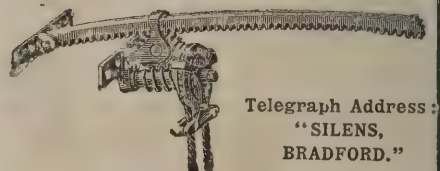
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PROGRESS IN CANADA.

WE have received from Sir Charles Tupper, Bart., High Commissioner for Canada, an advance copy of Part I. of the reports of the Tenant Farmers' Delegation which visited Canada during the autumn of 1893. It refers to the visits of English agricultural experts to Canada, and should prove of interest to those engaged in agricultural pursuits. The reports given are those by Messrs. R. Shelton, Nottingham; B. Waddington, Chesterfield; J. Cook, Cleobury Mortimer; and J. Smith, Sowerby. The reports, however, are interesting to others besides agriculturists, for the authors have enlivened the technical information by many remarks on what they have noticed *en route* as to buildings, scenery and municipal arrangements in the cities and towns passed through. One thing that will strike the reader is, that while in this country we are tentatively using electricity for lighting and motive purposes, the Canadians have been employing it for all purposes. In Mr. Shelton's report, for instance, occur the following remarks:—

Darkness setting in shortly after our arrival at Quebec, and a severe thunderstorm raging at the time, we were reluctantly compelled to abandon our intention of taking a run round the city, especially as the vessel lay to on the opposite side of the river, at Port Levis. The whole outlook after daybreak the following morning, as we continued our course up the beautiful St. Lawrence river, was one of such exquisite beauty as I have never before witnessed, and far beyond my abilities to describe. To travel on board ship right through the estuary of the St. Lawrence and then up the river in such beautiful weather as we were then enjoying, and to behold the varied and attractive scenery which everywhere presented itself from either shore, I felt was enough to repay one for any expense or inconvenience necessarily consequent upon leaving home and business for a rather long period. The river smooth as glass; the air, though hot, yet fresh, clear and exhilarating; the ship riding so steadily as to make it difficult to tell she was moving; here hills sloping to the river, covered, or partially so, with young trees of various hues; next a flat of cultivated land, principally consisting of corn crops, some cut and in stook, and some awaiting its turn to be similarly treated; with here and there dotted about at intervals, varying from a few yards to a few hundreds, neat-looking cottages built of wood, and with coverings of almost endless variety, showing unmistakably that the occupations are generally very small, owned and occupied, I was told, principally

by French Canadians; then a quaint little village would come into view, with its dwellings of greater or less pretensions, and with its pretty church—all contributing their quota to the apparently almost endless scene of exquisite beauty.

The good ship landed us at Montreal about 1.30 P.M. on Saturday, August 26. Montreal has a population of about a quarter of a million, 64 per cent. being of French extraction. No expense has been spared to make the city attractive. It is lighted by electricity, and has a very complete service of tram-cars, which are driven by electricity, about fifty miles of lines being already in use. The public buildings are on a scale not often excelled, and there are about 140 churches of all denominations, as well as a Roman Catholic cathedral, which, it is said, has had four million dollars expended upon it, and is now awaiting completion for want of funds. Roman Catholics and Presbyterians take the lead, and apparently vie with each other as to the size and splendour of their edifices, though the Church of England has a splendid cathedral.

We left Montreal on Monday, August 28, for Ottawa, the capital of the dominion, which has a population of close upon 50,000, and is rather picturesquely situated at the junction of the Rideau and Ottawa rivers. There are numerous fine residences, hotels, &c., all of which are overshadowed by the stately Houses of Parliament and other Government buildings. There is here, also, a very full service of tramcars, which, like Montreal, are driven—as well as the streets and the more important buildings being illuminated—by electricity. The principal industry of the city appears to be the lumber trade, although there are a number of other industries, such as paper manufactories, match manufactories, &c., several of which we visited with much interest. Vast quantities of logs are floated down the Ottawa river and its tributaries, and are here sawn into lumber, a term which in Canada seems to be applied to all kinds of converted timber.

Leaving Ottawa on the morning of August 30 we travelled by Canadian Pacific Railway to Winnipeg, the journey occupying 52½ hours, the distance being 1,304 miles. The scenery at times was very charming, many places of note being passed. Lake Superior, winding in and out round numerous little islands, is a most effective spectacle, extending for many miles, now in, now out of view from the train. Still, the outlook for some hundreds of miles was extremely monotonous—one vast forest, rugged and undulating, chiefly of fir trees. The timber had the appearance of lacking a sufficiency of suitable substance for healthy growth upon the rocky foundation which every-

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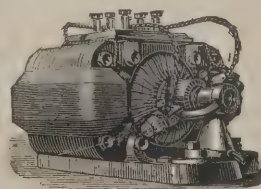
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where prevails. Here and there might be seen stretches of forest destroyed by fire, little more than the charred stumps of trees remaining.

On reaching Winnipeg we were met by Mr. G. J. Cox, a gentleman who had been deputed to act as guide to our contingent of delegates throughout our tour through the provinces and territories of the North-West. We were driven to the Manitoba Hotel. Although the population does not exceed 30,000, this edifice is eight storeys high, and has over 700 bedrooms. In the principal streets of the city there are numerous fine buildings, while the main thoroughfares are 132 feet wide, and have four sets of tram lines, the cars upon two of which are driven by electricity and two by horse-power.

As we approached the "Rockies" an observation car was attached to the train—that is, a large car open along both sides, specially designed to allow an unbroken view of the wonderful mountain scenery. To attempt to describe this scenery would, I feel, be nothing less than presumption on my part. These mountains reached about 500 miles either side of us on our journey, many of them of such dimensions and of such an altitude as to fairly strike one with feelings of awe as well as admiration and amazement. Many of the higher ones had their summits enveloped in the clouds, while others of still greater altitude peered right through the clouds, and in the distance—with their rugged tops thickly capped with snow, which a summer's sunshine and heat had been powerless to remove—looked like huge icebergs. The train for some hundreds of miles wound its way by the course of a river or rivers, running nearly always on the base of the mountains, sometimes only a few feet, and sometimes a great many feet above the edge of the water, and often made such sudden and sharp turns as to make its progress appear decidedly unsafe, although at such times it was driven very steadily. It is said that in passing through these mountains "the railway leads at different and many times towards every one of the thirty-two points of the compass."

As we emerged from this glorious mountain district and approached Vancouver, it was at once noticeable that we were in a country of a different climate; the apple, pear and plum trees, the thorn, and the herbage in the fresh-looking pastures—all conspicuous by their absence in Manitoba and the Territories—at once proclaiming the fact. The climate of British Columbia is said to resemble that of England, but with a greater average rainfall. We reached Vancouver on Saturday evening, September 30, the journey from Regina having taken

a little over forty-eight hours, the distance being 1,125 miles. Although this city was, with the exception of one solitary house, totally destroyed by fire so recently as 1886, it is now about the best built and prettiest place we visited, with a population of about 18,000. It fronts on Coal Harbour, a widening of Burrard Inlet, and extends across a strip of land to English Bay, along the shore of which it is now reaching out. Streets are wide, and the principal ones asphalted. It is lighted by electricity, and has its service of electric trams.

Of Vancouver Mr. Waddington says:—Previous to 1886 a dense forest covered the ground now occupied by the city of Vancouver (population, 20,000), well situated on Burrard Inlet. It has a splendid harbour of deep water. There is a line of steamships running from here to China and Japan, also to San Francisco and other Pacific ports; and as the terminus of the Canadian Pacific Railway, Vancouver must become a large and important city. Around it are immense forests of splendid timber, rich minerals in variety and rivers teeming with fish. The city presents a straggling, unfinished appearance, but there are many good buildings—hotels, banks, churches, &c.—of granite and brick, and one can hardly realise that all have been built in seven years.

Of Montreal Mr. Joseph Smith says:—We arrived about two o'clock on Saturday afternoon, August 26, and went to the St. Lawrence Hall Hotel, where we stayed over Sunday. The same afternoon we went into the town and saw what could be seen of its buildings. The streets are well laid out, with boulevards and squares, large, substantially stone-built public buildings and offices for the business part of the town. It is a city of electricity; everything goes by it—the telegraph, trams, street lamps, and nearly all the houses and shops are lit by it. The telephone is everywhere, and is very convenient. You can order from your butcher or baker the day's provisions without going out of your own house. The churches are on a grand scale.

Of Winnipeg he says:—Evidently the inhabitants have great faith in the future of their city, for the buildings generally and appointments are far in excess of its present requirements. The streets are very wide and pleasantly laid out; the electric car, telephone and electric light are in general use, and there is no crowding, as is the case in too many of our large towns. The growth of the place is astonishing, for when General Wolseley led his force in 1870 from Fort William to Fort Garry (as it then was called), there were only about one hundred inhabitants; now there are nearly thirty thousand.



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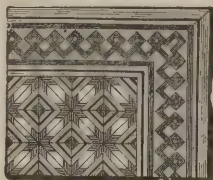
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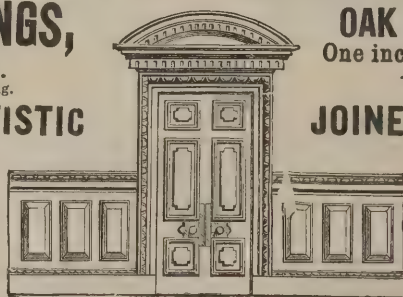
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5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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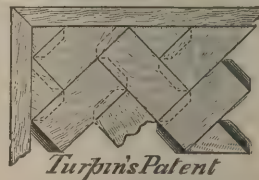


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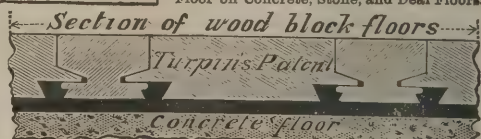
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Section of wood block floors
Turpin's Patent
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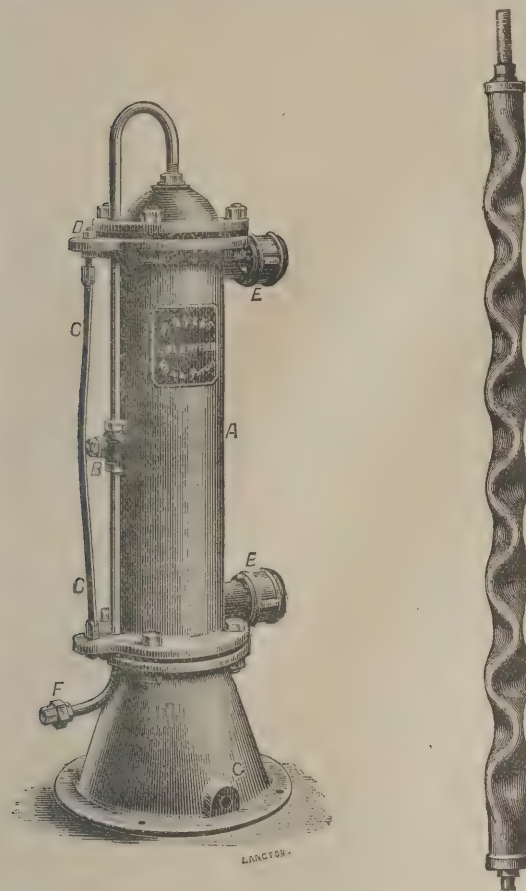
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NOTES ON NOVELTIES.

The "Row" Calorifier, with Royle's Patent Automatic Steam Attachment.—An apparatus for heating water for



baths, lavatories and all purposes where an abundant supply of water heated by steam is required. The "Row" Calorifier appears to be more efficient and occupies less space than any other system. The automatic attachment is a most important addition to this kind of apparatus, controlling the steam automatically so as to keep a uniform temperature in the water. The "Row" Calorifier is an application of the "Row" heating section arranged in a suitable casing. Steam is sent through the sections or tubes, and water is circulated around them. The water thus takes up the heat from the steam. The illustration shows a No. 4 Calorifier arranged for heating water by means of steam for circulating round a building, for which purpose it is provided with flow and return sockets cast to the body A (in the larger sizes we advise flange connections), in which are fitted the "Row" heating sections or tubes, and the action of these tubes in heating and circulating the water is exactly the same as an ordinary boiler, except that the heating medium is steam instead of fire heat. The automatic attachment consists of a steam valve B, controlled by a tension bar C. This bar is rigidly attached to the calorifier body at its ends, and having a slight amount of bow in it (like a bowstring on the stretch), is extremely sensitive to any variation in the length of the calorifier arising from change of temperature. Alteration in temperature causes the bow to move the regulating valve B nearer to or further from its seating, and thus control the steam supply automatically, maintaining an even temperature in the circulating water. The temperature can be varied by altering the adjustment at D. The condensed water is discharged at G, and a suitable trap should be fixed at this point, or under favourable conditions the water may be led back direct to boiler. The "Row" heating section referred to above consists of a copper tube indented in a peculiar manner, as shown in the illustration. It is found that a tube flattened or indented in this way has double the efficiency for heating purposes over a plain tube, and the reason why this apparatus is more compact and efficient than heaters with plain tubes or coils is thus apparent. Moreover, the indentations render the tube elastic, so that fracture at the ends, so common in coil and other heaters, is impossible.

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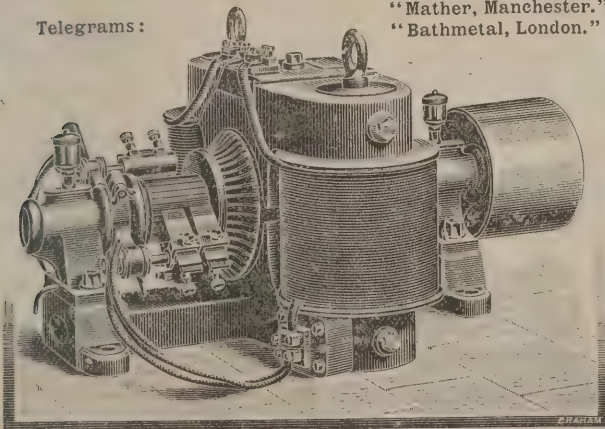
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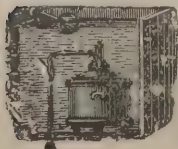
PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866, November 1867, and May 1870. *The Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10*s*. and upwards. Portable Filters on this System, £1 5*s*. to £3.

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157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



INSTITUTION OF CIVIL ENGINEERS.

At the last meeting, Mr. Alfred Giles, president, in the chair, a paper was read dealing with "The Prevention and Detection of Waste of Water," by Mr. Ernest Collins.

Waste of water comprised—(1) visible waste above ground, caused by defective mains or pipes, or by unsound and unsuitable house-fittings; (2) hidden waste, arising from broken pipes underground, or from faulty mains or services, where the water escaped unperceived and found its way into sewers or disused drains, also that arising from secret overflows from baths, cisterns, underground tanks, gas-engine coolers, &c.; (3) wilful waste caused by leaving taps open and tampering with fittings; (4) undue consumption of water, which, although used wastefully, was serving some useful purpose. The first two kinds of waste could be dealt with by systematic inspection, constant supervision and the employment of suitable appliances. Wilful waste was difficult to discover, whilst it was still more difficult to find the offender, and it was most difficult to obtain a conviction of the offender when found. Undue consumption was difficult to define. What some might hold to be unnecessary consumption, others would consider a legitimate use of water.

Among fittings which caused undue consumption, the automatic flushing-tank was a very objectionable form of apparatus. Another frequent cause of undue consumption was the faulty design of closet-pans, which should be so constructed that the jet of water might act on the soil to be displaced in the direction of the outlet. Where this was carried out the regulation allowance of two gallons at each flush would suffice.

Hydraulic motors, lifts and elevators, when worked off comparatively low-pressure mains suitable for ordinary domestic or trade supply, occasioned undue consumption. Ornamental fountains and careless garden-watering also gave rise to undue consumption and, in some cases, wilful waste. One of the chief means of preventing waste was the introduction of thoroughly efficient fittings into the houses of consumers. The regulations made with the approval of the Board of Trade, under the Metropolis Water Act of 1871, were among the main difficulties which embarrassed water companies in London. Many of these regulations were in themselves good, but were so hedged by precautionary clauses as to render them frequently abortive.

In 1883 the directors of the New River Company were called upon by the Local Government Board to transfer certain districts within the area of their supply, containing about 22,000

old houses, from the intermittent to the constant system. Attention having been directed to their responsibility and to the difficulties which would have to be encountered, especially in the provision of suitable water-fittings, they empowered the author to introduce a system of testing and stamping fittings, with a view to aid consumers to obtain good fittings and to protect them from the annoyance and loss resulting from the use of inferior apparatus. The system then introduced had developed extensively, and there had been a material improvement in the quality of the fittings. Manufacturers who were at first antagonistic had become strong supporters of the system—so much so that the use of untested and unstamped fittings was in the district of the company mentioned almost the exception, and where such fittings were used they were invariably of the same strength and proportions, and in accordance with the regulations adopted by the company. Every fitting received to be tested was taken to pieces. Each part was superficially examined, gauged and weighed. It was afterwards stamped as approved by the company.

The idea of detecting waste by means of meters was introduced many years ago, and a method of measuring the flow of water in pipes in any given time was invented in 1854 by William Peace. The Deacon waste-water meter was that generally in use; it was compact, easily regulated, and fulfilled generally the requirements. Equally good results could be obtained from the Tylor meter as from the Deacon meter, although the working of the former was a little more difficult and the reading of the diagram was not so simple to the unpractised eye. Many years ago the Kennedy meter was used for the detection of waste in waterworks; the meter being placed upon wheels, was utilised, with a hose attachment, at any part of a district where it might be required. Very good results were so obtained, although the feature of measuring the quantity in a given time was not utilised. The Kennedy meter was now adapted, with a clock-and-drum arrangement, for waste-detection. Another suitable instrument was the Ginman meter, being an adaptation of the reflux valve in combination with a clock and drum; but it was at present little known or used.

The waste-water meter enabled an inspector to see at a glance the precise locality in any district where waste was taking place. The expense of the introduction of the system was considerable, the author's experience showing that in many districts in London it involved an outlay of about 150% for every 1,000 houses so controlled. This sum included the cost

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of the meters and of fixing them on a by-pass, with sundries incidental to the fixing of valves for isolating the divisions of the district. In laying out districts for the waste-meter system care should be taken that the district to be controlled by the waste-meter was not too large. The author had found from experience that a 4-inch Deacon meter could well control about 400 to 500 houses; but districts smaller than this were desirable. Generally a large district was neither satisfactory nor economical in working; it necessitated more careful manipulation and the increased number of divisional valves added to the labour of the inspectors in order that accuracy might be insured. It was possible, with some contrivance, for a waste-water meter to control 2,500 houses, but an existing district could seldom be so arranged.

Although the use of waste-water meters was effective, and indispensable for a constant supply, it had been frequently urged that it involved a heavy initial outlay and annual expenditure for staff. The heavy outlay might be admitted, but the maintenance of an expensive staff exclusively in connection with the waste-meter system was an unfair inference from the facts. The system was indeed most economical, because it enabled the staff to efficiently cover and keep in order much larger districts than it could otherwise cope with. If the meters were, as they always should be, constantly worked, they continued to point out clearly the localities where waste existed, and thus to keep the staff continually on the alert. To deal effectually with the suppression of waste in large districts without waste-water meters, a very much larger staff of inspectors would be necessary, and even with a very large staff of inspectors a great number of hidden leakages would be altogether missed, which the waste-water meter effectually detected. The quantity of waste from this source had been found to be between one-third and one-half of the total amount of waste. In some instances meters were purchased and fixed at considerable expense, diagrams were taken off at stated periods, whilst few steps were taken to rectify the defects which the meters were constantly indicating. The meter system was then condemned as useless; whereas, in most of such cases the men in charge were really blameable and endeavoured to hide their shortcomings under a condemnation of the system.

The author then proceeded to describe in detail the system adopted by him for the efficient working of the waste-water meter system. By means of this system he had, dealing with an estimated population of 87,000 in Shoreditch, effected in the course of three years a diminution of waste and undue con-

sumption amounting to 720 million gallons per annum. This was effected at a capital outlay of 1,800*l.* and an annual expenditure for staff and establishment expenses of 926*l.*

ASSESSMENT OF IRONWORKS AND FACTORIES.

THE revision of the assessments of ironworks, factories, &c., at Wolverhampton by the overseers of the poor has led to greatly increased valuations. The basis of assessment had not been altered for 25 years, and many of the valuations have now been doubled and trebled, and in some cases even quadrupled. The assessment of a short section of the grand junction portion of the London and North-Western Railway, used chiefly for the cattle and dead meat traffic between Liverpool and London, and also as a through route for express passenger trains, has been raised from 270*l.* to 3,200*l.* That of the large ironworks of Messrs. John Lysaght, Limited, is increased from 2,030*l.* to 4,000*l.*; a portion of the Great Western Railway from 3,000*l.* to 5,200*l.*; the ironworks of Sir A. Hickman, M.P., are put up from 560*l.* to 2,170*l.*; the gasworks, 7,300*l.* to 13,940*l.*; the works of Messrs. Bayliss, Jones & Bayliss, 1,110*l.* to 2,760*l.*; and the Staffordshire Steel Company Limited, 560*l.* to 1,800*l.* Most of the breweries and hotels are quadrupled in assessment, and the valuations of the charitable institutions are also raised considerably. The assessments of the canal companies are unaltered, and reductions are granted on the tithes. The principal firms have convened a meeting with the view of arranging for appeals to a legal tribunal in the event of concessions not being made. The enhanced valuations will have the effect of yielding a larger revenue and reducing the rates, which are among the highest in the kingdom.

THE *Building and Engineering Journal*, in describing the state of affairs in Melbourne, says:—"A careful estimate of the present business in Melbourne and suburbs shows that the volume of trade has fallen away to about one-twentieth of what it was four years ago. This, of course, means that at least two-thirds of the architects and 75 per cent. of the builders have been thrown out of employment, and that the remainder cannot even then command sufficient to make their returns provide for more than barest necessities."

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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ORDINARY BURNERS, 50 calories per candle per hour.
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THE AGE OF THE REFORMATION.

NATIONAL BUILDING TRADES EXHIBITION.

OWING to the early issue of *The Architect*, in consequence of Good Friday falling this week, several descriptive matters are necessarily held over. The programme of lectures is as follows:—Monday, March 19, 3.30 P.M., Mr. H. W. Burrows, on "Selection of Building Stone"; March 21, 3.30 P.M.; Mr. Frank Ashwell, "Warming and Ventilating." Same day, 8 P.M., Mr. F. R. Farrow, "Picturesque Buildings" (lantern illustrations). March 24, 3.30 P.M., Professor Norman, "Chemistry of Clays and Marls." Same day, 8 P.M., Mr. H. H. Collins, "Progress in Sanitation." March 28, 3.30 P.M., Mr. T. de Courcy Meade, "Advantages of Technical Museums in Advancing Sanitation." Same day, 8 P.M., Professor Banister Fletcher, "Architecture: its Civic and Commercial Value." The trade competitions take place on Saturday, March 24, at 3 P.M., and Wednesday, March 28, at 5.30 P.M.

Under the direction of Mr. Glenn Wesley, an excellent musical programme between the hours of 7 P.M. and 10 P.M. is rendered by Miss Eleanor Clausen's orchestra of young ladies, the Pompadour Band, Miss Eleanor Clausen acting as conductress. We now resume our notices of the exhibits as follows:—

Council Room.

Messrs. W. Turner Lord & Co., of 120 Mount Street, Grosvenor Square, have furnished the Consultative Committee-room in the centre of the building at very short notice in antique French styles of Louis XIV. XV. and XVI. besides English work of the Elizabethan, Adams and Georgian period. They show in this room carved oak Louis XV. panelling, being much engaged upon reproductive work characteristic of these periods in both plaster and carton pierre. But among other interesting reproductions are their special silks, chintzes and wall-papers, the latter being a very important department. The Council and Press-rooms are both lighted

by means of small arc lamps, made and lent by Girdlestone, Tatham & Co., of 16 Davies Street, Grosvenor Square. This lamp has been adopted by many of the leading electrical houses. The carved-oak panelling is in the style of Louis XV., a method of decoration very much in request at this time, while the furniture is also French, the writing-table corresponding in style with the panelling, as does also the kidney-shaped marqueterie-table and the gilt screen. The circular marble-top table is of the Louis XVI. period, the console table being Louis XIV., and the two chairs covered in green figured silk velvet correspond also with this date, but the covering is of an earlier period, viz. that of Louis XIII. The chair in tapestry is specially worthy attention, being a reproduction from the celebrated Beauvais works and of the period of Louis XV. The two chairs in plain green velvet are reproductions from Louis XIV. models. Special attention has been paid to the bronze-gilded metal mounts, with which the furniture is decorated. The hangings, curtains, portières, tapestries, &c., are exquisite, and we believe they are productions from the Royal School of Art Needlework at Exhibition Road, South Kensington.

Parkers, Limited.

Among the handsome specialties of Messrs. Parkers, Limited, of Conybere Street, Birmingham, is a massive fumed oak mantel and overmantel suitable for dining-rooms in large mansions and public buildings, &c., where a baronial effect is desired. For drawing-rooms is an elaborate one in dark mahogany. For billiard, library and smoking rooms is another handsome mantel and overmantel in fumed oak. Other mantels and overmantels are carried out in walnut, mahogany and pine woods. A mantelpiece in oak, specially designed by Essex, Nichol & Goodman, of Birmingham, for the New Municipal Technical Schools, should also be mentioned. For other details we must refer our readers to the notice in *The Architect* last week, but a visit should be made to the stand.

St. Pancras Ironwork Co.

The St. Pancras Ironwork Co. have in their stand the usual well-got-up display of stable fittings, pavement lights and staircases. They also show some very well-made specimens of wrought-iron doors, in accordance with the most recent requirements of the County Council. These have a 3-inch lap on all sides except the bottom, and the crevice here is blocked by an ingenious device, by which when the door, which is self-

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closing, shuts, a sill-piece rises from its previous flush position in the floor and covers the aperture, thus checking the flow of air or smoke. When such doors are fixed in pairs, as is usually the case, one on each side of a party wall, a fire would take a very considerable time to pass through. The same firm show also some good new designs of iron staircases, some of which are fitted with Mason's well-known patent lead and steel treads, at very moderate prices. A self-balanced glazed cellar flap and self-fastening safety coal plates seem to be great improvements on the old plans; and we noticed also some good designs of mosaic tilework, which allow a considerable amount of light to pass through without impairing the appearance.

Messrs. Jetley.

We have not been accustomed to see at any of the previous Building Exhibitions such works of art for interior decoration as are now being shown by Messrs. Jetley, of 8 North Audley Street, who have always aimed at correctness of style in their artistic productions. Their rooms, wherever we have seen them, either in carved oak or carton pierre, being in the present English, Renaissance, Jacobean, Italian or French, have always an artistic air and finish, showing a knowledge of styles and love of the work. Messrs. Jetley show us some of the French masterpieces of the last century, having had permission to reproduce from the originals the finest specimens of the Kings' Palaces at Versailles, Fontainebleau, the Château de Rambouillet and several others, the Louis XV. panels of the Château Doubise with Fables of Fontaine, also the Louis XVI panels belonging to the King's Study at Versailles. The parts of the ceiling of the Rambouillet are works which will greatly tend to raise the taste of our workers for interior art. We understand that Messrs. Jetley are able to reproduce all these great masterpieces of French rooms at comparatively low prices, as they have all the models and others in a great variety of styles at their show rooms at 8 North Audley Street, Grosvenor Square.

Moule's Patent Earth-Closet Company, Limited.

This company, 5A Garrick Street, W.C., have a fine variety of their well-known earth-closets, which are so useful in many localities. A model shows their adaptability for school purposes. High-class requirements, it will be seen, are provided by more expensive woods being used in the construction, beautifully polished and finished. Several new closets are also shown, for which patents have been secured. The large variety of these

earth-closets is no doubt due to their having been specially designed to suit all kinds of buildings, viz for cottages, gentlemen's houses and mansions, with another variety for servants' use, for hospitals, for infirmaries, schools, factories, unions, &c., for offices, others for invalids, &c. In nearly every case there is something special which renders it more suitable for the particular purpose.


British Metal Expansion Company, Limited.

Visitors to the exhibition have an opportunity afforded them of inspecting the patent expanded steel lathing at the stand of the British Metal Expansion Company, Limited, of Hartlepool, for fireproof works. The company can point to a long list of theatres and other important buildings where this as a fireproof material has been successfully used during the past two years. It has been used for "Constantinople" at Olympia, notably in the pillars and arches of the Hall of 1,001 Columns and the Galata Tower. The expanded lathing is made of the very best steel that can be got; also it provides a perfect key, and thirdly, it is completely embedded in mortar, and therefore beyond the reach of fire, forming a splendid protection for columns, girders, stanchions, &c. Architects and local authorities have adopted it for fireproofing staircases. Likewise it has proved its utility for walls, floors, ceilings, &c. The company have received some excellent testimonials as to severe tests it has withstood under outbreaks of fire and other catastrophes. The London showrooms are at 3 Lambeth Hill, Queen Victoria Street.

Hartley & Sugden, Limited.

Messrs. Hartley & Sugden, Limited, of the Atlas Boiler Works, Halifax, are well represented by a typical display of their celebrated boilers. As manufacturers of wrought-iron and steel-welded and rivetted boilers of every description, for hot-water apparatus, kitchen range boilers, gas boilers, hot-water valves, slow combustion stoves, &c., their reputation is already well known to our readers. During the past twenty years the firm have received over forty awards, including gold and silver medals at various exhibitions. The patent "Climax" boiler, a special favourite, is of course exhibited, also the wrought-welded "Premier" boiler, the "Gold Medal" boiler, the "Chatsworth" boiler, and a plain saddle boiler, the independent dome-top cylindrical boiler, an independent dome-top boiler with waterway bottom; this can be safely used with bad water. All sediment falls below the grate-bars, where it cannot injure the boiler, and manholes and covers are provided around

REVOLUTION IN BUILDING.

 ARCHITECTS are invited to Inspect the Patent System of Dovetailed Corrugated Iron FIREPROOF FLOORS, PARTITIONS and BUILDINGS of every Description.

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the bottom for cleaning out. The independent "Duchess" is a new boiler, very powerful and economical, and specially suitable for heating long ranges of pipes, where an independent boiler is preferred. The new independent "Chatsworth" boiler is an adaptation of the Chatsworth, designed for working with very shallow drainage, capable of heating long ranges of piping, and no brickwork is required. Independent harness-room boilers have patent open fire fronts and bars. For greenhouses, &c., there is shown the "Halifax" heating apparatus, and also the independent "Star" boiler (pattern E) and the "Palatine" (conical pattern), the "Alexandra" multitubular gas boiler with copper tubes and condenser to prevent back-draughts, and the "Stanley" boiler. The rivetted vertical steam boiler, with cross tubes in fire-box, is suitable for contractors, agriculturists and general purposes. A visit should certainly be paid to this stand.

King & Son.

A familiar exhibit is that of the patent "Honeycomb" wine-bin, previously exhibited by Messrs. King & Smith, now under the title of Messrs. King & Son. We have explained on previous occasions the novelty in the construction of this wine-bin. Tubes of terra-cotta, circular interiorly to shape of bottle, are stacked along the cellar walls, naturally fixing together solidly, as exteriorly the tubes are hexagon or "honeycomb" shape. Terra-cotta does not suffer from corrosion, and along with firmness, durability is secured. The tubes can be made to act also as refrigerators by evaporation after sprinkling them with water. Breakage of bottles is avoided, as each bottle is independent of its neighbours. Another advantage is no awkwardness in access to the cellar; in some cellars it is next to impossible to pass down framed racks.

Charles Batchelar.

The exhibit of Mr. Charles Batchelar, of 208 Holloway Road, is nothing if not a genuine building exhibit. Architects and builders not only require building materials, but they would find it difficult to get on without building plant. Among the indispensable appliances are ladders, spars, poles, boards, barrows, cords, putlocks, &c. The exhibit can scarcely fail to attract the eye of practical men, as at the first casual glance the character of the exhibit reveals itself. There is a good show of ladders, jointed ladders, painters' trestles, excavators' (navvy) barrows, garden (box) barrows and various other barrows, swing-back steps and other varieties of steps, trolleys, cords, pulleys, &c.

Frederick Jones & Co.

Messrs. Fredk. Jones & Co., of Perren Street, Ryland Road, N.W., again have a prominent exhibit of their patent British-made silicate cotton or slag wool, made from blast furnace slag, for which they have been awarded medals and certificates at a score of exhibitions. Since they introduced this material to the public some eighteen or twenty years ago, it has come to be extensively employed in buildings of every description, and architects now specify it largely for fireproofing, for deadening sound and for preventing the transmission of heat and cold. The various made-up forms which Messrs. Jones & Co. manipulate their silicate cotton into are practical and simple. Amongst these we may mention their "sheets" (between wire-netting) for lining floors, walls, roofs, partitions, &c.; their "strips" (on canvas) for winding spirally round hot or cold pipes; and their patented "combination slabs," *i.e.* fireproof plaster slabs lined on one side with silicate cotton. These slabs, which can be easily nailed up under the joists, form a perfectly fireproof and soundproof ceiling, and entirely obviate the old-fashioned sound-boarding as well as lath and plaster. It is obvious that, in addition to its other advantages for use in dwellings, silicate cotton possesses the merit of being incapable of harbouring vermin of any kind or the germs of insect life. We also notice that one side of Messrs. F. Jones & Co.'s stand is devoted to a display of specimens of their fibrous plaster—a new branch which they have recently added to their business. They show samples of ornamental panels for ceilings, ornamental and plain cornices, &c., as well as both fibrous and fireproof plaster slabs.

Walter Monnery & Co.

Messrs. Walter Monnery & Co., 69 Southwark Bridge Road, S.E., are exhibiting Fryer's patent ventilators and Fryer's patent cowls. The cowls obtained the highest award at the Edinburgh International Exhibition, and appear to have given general satisfaction, having cured down-draughts and smoky chimneys by causing a powerful up-draught. It forms practically a part of the chimney-stack, and there is no danger of the head blowing off in storms. The bearings move in oil, and there is neither friction nor noise. The principles of construction prevent any accumulation of soot, dust and dirt, and easy access is provided for examining the bearings and for using a sweep's brush. There is also a self-contained supply of oil which will last for years.

W. A. Hooydonk.

Mr. W. A. Hooydonk, of 2 Little Howland Street, Tottenham Court Road, shows his system for interior decoration, which is styled Dækoría. Where carved woodwork is not employed, owing to expense, ornamental effects have been produced by the use of carton pierre, &c. Mr. Hooydonk's Dækoría secures all the requisite ornamental effects without any liability to warp or shrink through heat or damp, or crack or become detached and fall off. Mouldings and panellings are one with the structure of the wall itself, and therefore cannot be detached. It is very adapted for ornamentation that has to stand rough usage in theatres, public halls, &c., as sharp blows even on ornament, which is in high relief, would merely cause an indentation. It is also fireproof. All mouldings and panellings are one with the structure of the wall itself, and cannot become detached. In jambs, columns, pilasters, small frames, &c., the whole is produced in one piece; there are no joints to open or crack. The stand forms a room, that is, there is one complete wall; the other three sides open. Columns carry the canopy which is necessary to form and show the ceiling. The work is carried out in Elizabethan style.

T. Potter & Sons, Limited.

We notice that Messrs. T. Potter & Sons, Limited, art metal-workers, memorial brass engravers, ecclesiastical and Mediæval metal-workers, have a good display at their stand of art metal and wrought-iron ornamental work, &c. We hope to refer to this exhibit later on at more length.

W. Gooding.

Mr. W. Gooding, of North Road, Holloway, is exhibiting his excellent system of treads, known as the interchangeable treads. The tread consists of a metal keeper or framework, fitted with pieces of rubber or other material, which project above the metal-work. A firm elastic footing is provided, and the durability is altogether surprising, as may be seen from some shown at the stand that have been in use for years. They are suitable for any kind of steps or stairs for ships, yachts, omnibuses, tramcars, and, practically, wherever a step or stair is required.

Turpin's Parquet Floor Company, Limited.

The use of artistic joinery and wood-carving is well displayed in the exhibit of the Parquet Floor, Joinery and Wood-carving Company, Limited, 22 Queen's Road, Bayswater. One feature in the display is a room, or, to speak more correctly, one side of a room entirely fitted up in carved oak. The fireplace is framed in a massive and handsome carved oak chimneypiece, with over-mantel having large central mirror and side mirrors with bevelled edges. Corresponding in effectiveness is the carved oak dado and upper panelling or filling, frieze, &c., finished off with a very handsome and elaborate cornice. Both in design and execution the mantelpieces, panellings, panelled ceilings, staircase doors, handrails, balusters, newels, &c., leave nothing to be desired, and the fine character of the material itself is well calculated to do justice to the pains expended in design and execution. In regard to solid wood-block flooring, improvements have been lately patented constituting it the best of well-known modes of interlocking wood-floor blocks. Oak, antiseptic beech, teak, pitch-pine and deal are used (not less than 1 inch in thickness) on concrete, wood and stone floors, laid on and secured by a waterproof patent cement composition bedding, which also penetrates the dovetailed groove-joints, giving additional strength; in other words, forming an extra bond to the already interlocked floor-blocks. The woods before being used undergo a special antiseptic process, which removes sap, hardens the wood, and renders it a sanitary floor, especially for hospitals, and public buildings, where mixed assemblages congregate. Turpin's patent thin parquets and portable parquets are from the mode of construction strong and reliable. It is often supplied for temporary use, as, for instance, in ball-rooms. The company have supplied over ten million feet super during the last fifteen years. Attention should also be called to Turpin's Italian marble and ceramic mosaics for floors and walls, and terrazzo pavements of excellent workmanship in appropriate designs.

Hayward Brothers & Eckstein.

The well-known specialties of Messrs. Hayward Brothers & Eckstein are on view at this exhibition. One feature of the exhibit that should attract attention is Hayward's patent steel lathing. Ironwork, when first introduced for constructional purposes, was expected to hold its own in case of fire, but experience has proved the contrary. The idea of encasing iron and metal-work has proved satisfactory, as a certain amount of metal-work adds the requisite strength to the material which, so strengthened, can resist fire and so give protection to such valuable constructive materials as iron and steel. Hayward's steel lathing, taking the place of wood laths used in days gone by, and covered with plaster, makes one of

the strongest of walls or partitions, and as a protection against the spread of fire, nothing could be better. It gives a very perfect key, and, judging from the tests it has undergone, it would succumb to no ordinary fire. We saw some samples, for instance, that had been subjected to the foundry fire for half an hour, and then quenched with water, the key still remaining. Between the studs a 2-foot centre is amply sufficient. Patented last July, already, we hear, about one million square feet have been specified for. A novelty shown is a patent sash ventilator, by the use of which air can be admitted to rooms from the outside without opening the window. In many cases windows and doors cannot be left open at all times on account of tramps and others dishonestly inclined, so this simple little device will prove valuable to many. Well-known specialties of Messrs. Hayward Brothers & Eckstein will be seen in the way of pavement lights, stallboards, rolling lights, iron cellar-flaps in guttered frames, balanced flaps, self-fastening coal plates, ventilating panels for pavement lights, circular staircases, &c. Hayward's ornamental inlet (or Tobin) ventilators and other ventilators, wrought-iron sashes, stable fittings, architectural and general castings, &c.

Shanks & Co.

Messrs. Shanks & Co., of Barrhead, Glasgow, and London, display numerous samples of their various appliances, which have deservedly gained a reputation amongst the general public. In addition various improvements are shown, to which it would be well to draw attention. One very simple but most important item is Shanks's new patent accessible waste, which is shown as applied to baths and lavatories, and is a great improvement on the old style of closed-in or inaccessible wastes. By a simple arrangement instead of concealed standing waste and overflow, there is an open recess in which the valve-rod works, and which is finished like the interior of the bath. The grating, of specially large size and opening, is fitted above valve with a slotted or bayonet catch arrangement, so that it can be removed with the fingers for cleaning or other purposes. The valve-rod being usually of strong nickel-plated brass, and working through this grating, is a most cleanly, strong and simple arrangement. The overflow is cast on immediately behind the waste recess, and enters the waste just above seal of trap. Every time the taps are turned on, a special nozzle, led from the taps to the top of overflow, throws a jet of clean water down the sides of the overflow channel, and so keeps it always clean. Furthermore, it is raised as high as possible in the

bath, so that the chance of overflow and consequent soiling is slight, except in the case of taps left running with waste valve closed, in which case the overflow is sufficient to take away all the water. Another novelty is seen in a new spray bath which is the cheapest yet in the market, notwithstanding the excellence of construction and tasteful get up of the whole work. The plate with drained soap dishes is of a beautiful piece of marble. Among the new patent water waste-preventing w.c. cisterns is the "Levern," a valveless syphon cistern. In this, mechanism has been reduced to a minimum, with the advantage that there are practically no parts to get out of order. The discharge is rapid and the action is nearly silent, and in addition secret overflowing is out of the question. The exhibit includes, as we imagine will have been divined from the opening lines of the notice, sanitary appliances of every kind in the way of varieties of baths, lavatories, combination closets, &c. In these days of schooling, attention may also be paid to the excellent lavatories of Messrs. Shanks for the use of schools.

John Grundy.

Mr. John Grundy, of Tyldesley, Manchester, and London, has afforded visitors to the exhibition a capital opportunity of inspecting his familiar system of heating by hot air, in the large section of a stove enclosed in a chamber of white glazed brickwork. The largest of buildings could be most effectually heated by the one shown with a constant succession of pure air warmed. Within the chamber are two large flues, through which the outer air enters, and thence is dispersed as warm air in any required direction through various sheet-iron tubes. A damper in connection with each enables the supply of warmed air to be regulated or cut off as may be requisite. In front of the chamber a handsome brass ventilator similarly allows the warm air to be supplied or shut off. Below this ventilator is an arrangement of three sections giving every facility for sweeping and cleaning from the front, and each is provided with a small safety pipe. At the side near the back is a manhole through which access can be got to the interior if necessary. Stoves or grates are arranged on the same general principle, but having open fire for warming rooms, the outer air being supplied from the back, and the warm air supplied at the top of the stove or high up in the room from the chimney breast, according to the fancy of the client. These are much used in asylums, hospitals, &c., halls of mansions, billiard-rooms, drawing-rooms, and other rooms in residences, &c. One of the great advantages of this system of heating, for which also

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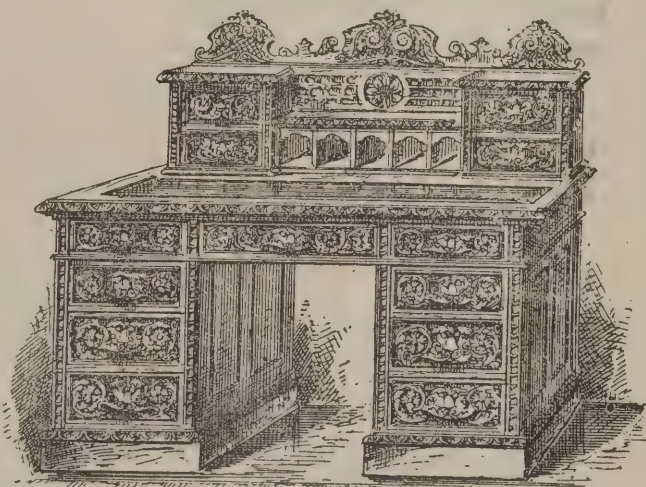
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it is much in request by so many, is the evenness of temperature which can be maintained by its use. The latest patent stove, suitable for large buildings, halls, churches, schools, offices, &c., is circular exteriorly. Interiorly there is a central large tube, surrounded by about half a dozen lesser sized tubes. The fresh air is admitted through the latter, passes the fire-box and ascends the central tube thoroughly well heated, whence, as necessary or not, it can be branched off in different directions. One interesting feature of this system is that the management is so simple that anyone can look after them; in fact, we heard that a blind man is in charge of a large one in Yorkshire.

Eagle Range and Foundry Company.

The gold medal Eagle ranges are exhibited by the Eagle Range and Foundry Company, of 176 Regent Street, W., in a well-selected assortment, and several novelties which many will be likely to appreciate are introduced. The Eagle ranges have been for about a quarter of a century before the public, and have carried off forty-five first prize medals. Among other merits there is economy in several directions in fuel, and in dispensing with the need of brickwork for flues; the flues being of iron. They can be used as open or closed fires, and the amount of fire increased or diminished as required. For cooking purposes and also for pastry-work all has been devised to secure the utmost perfection possible by the means of regulating the draught; it almost amounts to turning on the fire or turning it off as required at a minute's notice. One of the handsome Eagle ranges shown has improved ovens, in this respect, that the oven door has not to be opened till the cooking is complete. This, we hear, is of great moment in the case of cooking pastry. The oven door is of glass, enabling the cooking process to be watched readily. The glass doors have been tested and found free from danger of cracking, and no steaming of the glass takes place, that objection having been specially provided against. The Eagle grate certainly deserves attention, and should be inspected by visitors. It is not a complicated arrangement, though a written description of it might lead one to think so. As to appearance nothing could well look more elegant than the sample exhibited. There are three pairs of regulating doors. When all are shut, in summer for instance, it is an ornamental adjunct to the room, hiding the grate. If one or both of the upper pair of doors be open, ventilation if required is obtained. These doors are useful in regulating the draught, causing the fire to burn up quickly, after which

quick, medium or slow combustion can be maintained. At night, or on occasions when the room may be unoccupied for an hour or two, a perfect guard against sparks flying out is secured by closing the lower ones. Also they act as a fire-screen, as by closing three either one or other side of the room can be screened from the open fire. There is no difficulty in opening or closing the regulating doors, no sliding or mechanical operation being involved. The advantages are readily seen on inspection of the actual grate. A very ingenious chimney-top is shown, and guaranteed to do away with smoky chimneys and down-draughts. The construction, however, is exceedingly simple, or rather construction in the way of mechanism is altogether absent. A disk slightly above the smoke aperture diverts all down-draught, and expels it to the outer air. From its simplicity in lifting easy access is had for sweeping purposes. The company's guarantee enables a purchaser to return the pot should it be found unsuitable, and the full value will be allowed for it; but this guarantee does not imply that they bear the cost of fixing the pot. The various ranges exhibited should be inspected, as it will be found that they are shown in different kinds to suit any particular requirements, from very extensive to more modest needs.

C. G. Picking & Co.

The firm of Messrs. C. G. Picking & Co., of Bounds Green Works, New Southgate, N., have a very interesting exhibit for architects, builders and contractors. They show their system of fireproof flooring, or, as it is called, the patent twin-arch interlocking fireproof flooring, of which Messrs. Picking & Co. are the actual manufacturers. The principles aimed at seem to have been the securing in the simplest ways of solidity and strength, combining all fireproof and soundproof qualities with safety of load-carrying power, or a maximum of strength with the minimum of weight and thickness. These aims have been carried out by adapting to hollow tubular blocks a twin-arch design, along with the employment in their manufacture of a material that is both strong and refractory. The proportion of hollow space is larger than in any other system; this, together with the absence of any concrete passing down through the thickness of the floor, offers effective resistance to the passage of sound. The lateral interlocking arrangement is emphasised as a most important feature in the design, additional strength and security thereby being attained. The sections are in 2-foot working lengths, and so made as to completely encase the under-flange of the supporting girders. It



Manufacturers of Wrought Metal Work, Architectural Carving and Joinery for Ecclesiastical Purposes, Domestic and Public Buildings, Lighting Appliances, &c.

Estimates given to Architects' own designs.
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WORKS:—Eagle Works, Hornsey, N.; Porchester Street, Birmingham.

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The "COMPACT" has the following advantages:—

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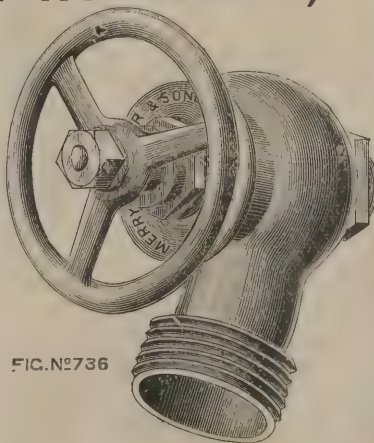
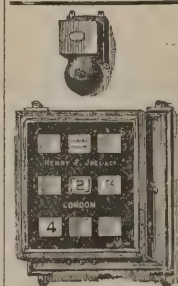


FIG. N°736



ELECTRIC AND PNEUMATIC BELLS

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TELEPHONES.
SPEAKING TUBES.
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NIGHTINGALE'S

EVER FIRM
Bevelled Wood Block
Flooring.

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SPECIALTY—
"Baltic
Redwood."

Prize Medal
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is also relied on as important that this floor does not need the extraneous aid of concrete to give it strength, and that there is consequently no temptation to economise weight by the employment in the concrete of a combustible material like coke breeze, as is sometimes the case, the double-arched blocks possessing in themselves the requisite strength without the addition of concrete to carry a safe load of 5 cwt. per square foot. They need only the covering of fire-resisting grout supplied with them to form a homogeneous floor. The finished face may be of wood, tiles, stone, or cement. Such a floor does not exceed 6 inches in depth, saving in head room on each floor throughout a high building. If for any special reason a heavier and thicker floor is required, there is no obstacle to it being so constructed. Also the soffits of the tiles are provided with dove-tailed ribs that give a substantial key for plastering. Plaster so fixed has remained intact under severe fire test.

John Tann.

Few will enter the hall without noticing the display made by Mr. John Tann, 11 Newgate Street, E.C. Burglars and thieves, if objectionable members, or rather hangers-on of society, can at any rate have the credit of having called intelligence of a higher order than their own to successfully baffle their chance of robbery. The destructive agency of fire has also to be reckoned with. Those who have valuables to protect cannot do better than apply to well-known manufacturers from whom to purchase their safes. These are, or should be, well known, and among them the name of John Tann stands high. We have before now alluded to the specialties of Mr. John Tann. The assortment shown has no doubt been made representative for the purposes of such an exhibition as the present, and will give a fairly good idea of the excellent character of much else that could not be shown without an impracticable amount of space had been taken. As it is, every inch of space has been utilised, and reference will be made to a few of the interesting articles shown. What has not been made before is a special five guineas safe that will be valued by all, viz. the only one that has ever been made bent out of one piece of steel. For general and trade purposes many persons will be pleased to have so cheap a safe to replace the substitutes to which they have hitherto trusted documents and other matters that it would be inconvenient if not disastrous to lose. Commercial men, bankers, rich people, &c., have to be catered for on a more extensive scale, and what will suit their requirements will be supplied by Mr. Tann. A feature of the exhibit,

from the architects and builders' point of view, is the display of fire and thief-resisting doors and frames for party walls, &c. Among them is a special emergency fireproof party-wall door having a three-way bolt, in action ease and simplicity itself. Another useful specialty is a plate closet-door, with three-way lock, specially suited for a butler's department. There is also shown a fine and massive banker's bullion-room door, with vestibule and gate, fire and burglar-proof and drill and wedge-proof, the whole weighing something over two tons. For more particulars of the specialties of Mr. John Tann we cannot do better than refer our readers to our descriptive articles previously published.

Mintons, Limited.

Messrs. Minton, Limited, of 28 Walbrook, show a large number of wall treatments in ornamental tilework. In blocks of buildings devoted to the purposes of offices, it is quite common in these days to see the walls of corridors, passages, staircases, &c., entirely carried out in decorated tilework. The samples that are shown in the hall are complete in themselves with skirting, dado, border and moulding, filling and frieze; as specimens of artistic design and colouring and judicious combination they merit great praise. There is, in addition, a large assortment of ornamental tilework for all purposes and of ornamental pottery, but at the time of our visit these had not been more than unpacked.

E. Walker & Co.

The Health water-pipe (Walker's patent) is shown by Messrs. E. Walker & Co., of Heckmondwike, Yorks. As the name implies, the use of the pipe secures health, rendering impossible evils such as lead-poisoning, &c. It obtained the highest award at the British Medical Association's Exhibition and other two gold medals. The pipe consists of a strong wrought-iron tube with an internal lining of pure block tin, so united at their surface of contact as to be perfectly inseparable by the action of the water, thus producing the strongest and purest water-pipe ever made. All the fittings being lined and fitted together with ordinary threads, the interior is absolutely incorrodible and non-poisonous. No soldering being required, it is much simpler to fix than lead. Water running through this pipe produces no bad effect on the teeth, as is the case with wrought or galvanised iron pipes. Owing to its prominent internal smoothness, this pipe will do of a less bore than any other metal pipe used for a similar purpose. It is also well

LYCEUM THEATRE.

THE PATENT FIREPROOF & SOUNDPROOF PARTITIONS

HAVE BEEN EXECUTED BY

W. POUNTNEY, Sole Agent for London, and Contractor.

This Patent Partition is constructed of Blocks or Slabs of Plaster material, formed with a series of longitudinal Tubes of Fireproof Material to deaden sound, each block being keyed to the adjoining one by light Iron Clamps, the whole being afterwards plastered on either side, and forming a rigid soundproof and fireproof construction.

When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4½ brickwork partition walls. The thickness from face to face is only 3 inches, thus saving enormously in weight and space.

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

W. POUNTNEY, 13 VICTORIA ST., WESTMINSTER, Sole Agent for London, and Contractor.

WALL INLET VENTILATOR

WITH INDICATORS

(DARRAH'S PATENT).

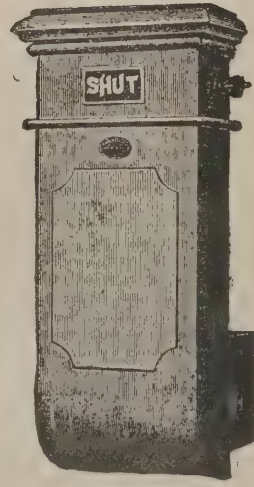
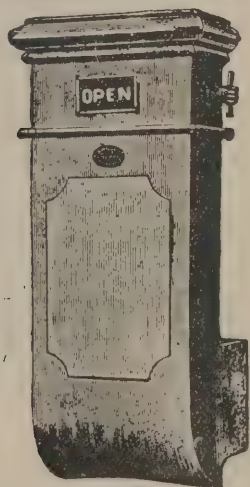
Incorrect Indication Impossible. Only One Action.

In the above we have introduced a most important improvement. It consists of an Enamelled Indicator, showing from any position when the Ventilator is open or shut. By this means all uncertainty is removed, and any person can see at a glance whether the ventilator is acting or not. The ordinary ventilator is often rendered quite useless by being shut off when it is supposed to be open, the only means of ascertaining the fact for a certainty being by holding the hand over the inlet, which is often difficult of access.

We shall be pleased to send a Model of Full-sized Ventilator on approval, carriage paid to any Architect for inspection.

BAXENDALE & CO.,

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adapted for hot water, as the joints cannot be broken by expansion and contraction, as is so often the case with soldered lead pipes; it thus obviates numerous repairs.

Coalbrookdale Company, Limited.

This company has a magnificent display, the largest in the hall, the length of the space occupied being 72 feet. The contents of the stand was epitomised in the issue of *The Architect* that was published on the opening day of the exhibition. One most imposing exhibit is the display of the York Gates, originally made for the Vienna Exhibition. One interesting detail in the art working is the twisted work, to execute which a special plant was laid down (Tuddenham's patent). The balcony railings are like these gates and other railing-work shown, exceedingly graceful; as also the staircase-work, spirals, newels, balusters, &c. One spiral staircase, designed by Mr. F. T. Pilkington, is the same as the one in Winchester House. Last week we gave the names of architects and artists who designed some of the works shown. Among ranges there is a circular-fronted range (Richard & Barton's patent), the advantage of which is the increased light obtained upon the hot-plate. A new fireplace, designed by Mr. Benson, of Bond Street, has been beautifully executed, having a recessed overmantel, with a handsome bevelled-edged mirror. Parker's patent "Kyrle" grate, which was awarded a gold medal at the Smoke Abatement Exhibition, should be noticed, a great feature about it being that it is constructed for burning anthracite coal. A hob-grate, designed by Mr. Scott Morton, of Edinburgh, is fitted with a front that pulls out for a coal-box. Other fireplaces are from designs by various architects, Mr. Basil Champneys, Norman Shaw, &c., a dog-grate being by Colonel Edis, and another grate with a special brick back, designed by Mr. J. J. Stevenson. The cabinet-grate, designed by Mr. A. H. Macmurdo, is a very handsome one, with bronze panelling representing "The Village Blacksmith" in high relief, and which was modelled by Mr. Creswick. Some fireplaces with cabinet overmantels, the whole in iron, though perhaps not very expensive, are most handsome ornaments to a room. Attention should also be called to the radiators the company are now making, and, before concluding, a word should be said of the electric-lighting arrangements of the stand. This is an exhibit in itself, the handsome variety of electric fittings being those of Mr. Harry South, of Garrick Street, Covent Garden. Numerous photographs also are shown of works carried out by the Coalbrookdale Company.

Shannon File Company, Limited.

In their special department in the manufacture of all kinds of office and library desks, and the various specialties comprised under the Shannon system of filing letters, bills, receipts, &c., in cabinets, the Shannon File Company are unrivalled. In office and library desks there is a great variety. Hitherto business men and others have had to accommodate themselves to an ordinary stock-designed article, but the Shannon Company's specialties are meant to accommodate themselves to everyone's requirements, so that it is only a matter of inspecting and choosing the right article. They are exceedingly handsome as articles of furniture, but as to price, not costly considering the amount of work in them. The Shannon system of filing is simply invaluable for any engaged in a large way of business, and those who consider time lost is money lost. By this system everything wanted can be found at once, and documents neither go astray nor are lost. The exhibit is a most interesting one to visit, and it will give a proof of what ingenuity, when on its mettle, can produce.

Incandescent Light Company, Limited.

A most attractive stand is that of the Incandescent Gas Light Company, Limited, of 33 Queen Victoria Street, E.C. The company are the sole manufacturers and owners in the United Kingdom of Dr. Auer von Welsbach's incandescent gaslight system, used with coal, water or oil-gas. We have before this explained the system, but it may be mentioned that it consists in a special burner which can be screwed on to any gasfitting in two minutes. It uses half the gas that ordinary burners do and gives double the light, which is perfectly steady. It is therefore a most economical light, and it is said that the saving effected in consumption of gas in the first year covers its cost and maintenance. It is also a healthy light, does not vitiate the atmosphere, nor blacken ceilings or decorations. It appears also to be useful for taking photographs in dull weather and by night. The burner is a Bunsen burner, so that the gas being mixed with atmospheric air the combustion is almost perfect, and there are practically no unburnt particles either of carbon or other material unconsumed to vitiate the atmosphere. There can be no doubt about the brilliancy of the light, which, as seen in broad daylight at the stand of the company, is quite dazzling. The variety of fittings, globes, shades, &c., are exceedingly handsome, being designed with great taste, the Punkak lamp especially. The grouping of two or four lamps in one cluster, after the fashion of a chandelier, produces a

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beautiful effect in lighting. The different modes of fitting up the lamps enables them to be used for any purposes of whatever kind, indoor and outdoor also. This exhibit should be visited, as it is seldom such a display could be arranged.

Baird-Thompson Ventilating and Engineering Co.

This company, 159 Queen Victoria Street, London, and 22 Bath Street, Glasgow, have a most interesting exhibit, having taken a very large amount of space, and it will be of interest to our readers to refer to a few of the many specialties that this company has made a reputation for among the many shown. A very perfect system of ventilation is shown for large buildings and ocean-going craft, steamers, sailing vessels, &c., by means of compressed air. It consists of a large air compressor or receiver, into which the air is driven or compressed by steam, gas, or any other motive power, to between 5 lbs. and 6 lbs. per square inch. From the receiver the compressed air is delivered through pipes to any part of the building or ship where a draught is required to create suction, and expel air and change it for fresh air. In this way pipes may be carried in any required direction. At the required positions a patent nozzle is connected with the delivery pipe, discharging the compressed air into a tube having an orifice opening direct on the air within the building or ship, and expelling the used-up or vitiated air. By careful tests made, it has been found that for every 5 cubic feet of compressed air that escapes from the nozzle 95 cubic feet of vitiated air are induced and expelled from the building or ship, proper inlets for the introduction of fresh air being distributed throughout the building or ship. The patent air propellers or fans for ventilation purposes have been subjected to repeated tests and have been found to drive a greater volume of air per horse-power than any yet in the market. The utility of these fans in keeping buildings, mills, &c., clear of dust, &c., is so well known that it is unnecessary to enlarge more on their merits. A fan is shown connected with a high-speed silent engine for ventilating purposes and forced draughts, for ships, &c., of a very great power. For use of hospitals, country residences, &c., an improved earth-closet is shown which gives an automatic discharge of earth whenever used, both directly before and after use—a novel and useful invention. A large filter—Atkins's patent cleanable filter—is shown, in which the reversed current used in the cleaning is made to thoroughly disintegrate the filter bed, causing considerable attrition between the particles of the filtering material and effectually

removing all impurities. This is especially suitable for swimming-baths, where economy of water-supply has to be considered, as also for general purposes where large quantities of water are required to be filtered for domestic and other uses, and for country residences, &c., for filtering rain-water. A very interesting system of heating, and one also very useful for drying-rooms of laundries, &c., is shown. Exhaust steam from an engine is condensed by a current of cold air that draws off the heat, giving condensed water at 112 deg. for boiler use. The heat from the steam is taken possession of by the air. There is no actual contact between the air and the steam, as they are in separate chambers, and therefore the warmed air is not charged with any moisture. These and other appliances will be seen worked by electricity. These are two or three specialties out of the many, for it is needless to say that, in addition, there is a representative collection shown of this company's well-known specialties in heating and ventilating appliances.

The Mangotsfield Pennant Stone Company, Limited.

One of the best exhibits in natural stone, that of the Mangotsfield Pennant Stone Company, Limited, of Shannon Court, Bristol, who have a splendid show of their stone, is well worthy of the attention of architects, surveyors, and all connected with the building trade. They show samples of edging kerbs, monumental work, and a beautiful font, designed by Mr. Walter Cave, architect, London, which has been much admired. Those who are thinking of building churches, schools, &c., and are at a loss where to obtain a good stone, should certainly pay this stand a visit, as there is a good show of walling, also steps, &c.

Sanitary Bath Company, Limited.

The Sanitary Bath Company, Limited, of New York, Detroit, Toronto, and 12 Miller Street, High Street, Camden Town, London, show their patent steel-clad copper baths. The patent steel-clad copper bath is constructed with an outside shell and an inside lining of planished copper, with highly-finished tinned surface. The rim is of polished mahogany, walnut, or other ornamental wood. The bath is supported by four ornamental iron feet, and the plug and overflow are nickel-plated. The bath is adapted to any class of fittings of whatever make, and will lend itself to any style of decoration, and being so well proportioned and compact, the weight is only about 100 lbs. The advantages claimed are:—It will last for

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years; no repainting; no chipping of enamel; all open and accessible; no place for accumulation of impurities; it does not cool the water as iron or porcelain does; it is light in weight, and stronger and more durable than any other bath; the patent tinning on the copper resembles electro-plate; it will lend itself to any style of decoration; it is relatively cheaper than any bath made.

Mainzer & Farrar.

Messrs. Mainzer & Farrar, 18 Berners Street, W., have on view their excellent steel and bronze "Climax" and "Eclipse" casements. These are guaranteed as thoroughly weatherproof and of the best possible make throughout. They are made in bronze, steel and wrought-iron. They are shown with the latest improvements, perfectly fitted and finished, hung on steel pivots on gun-metal bearings, after the fashion of safe-doors, preventing any possibility of sagging, and, where required, furnished with condensation sill attachments. A double casement of this firm's "Eclipse" section is shown, which is entirely weather-proof, and offers the least obstruction of light of any we have seen, the usual centre-bar being altogether dispensed with, the casements so closing up on each other as to form a perfect weather-tight junction, forming one of the lightest and strongest frames that could be produced. The frames are of steel, and each casement is fitted with a stay for adjusting them at any position. A special opening gear for a single light or a series of lights is also shown—the "Reliance" opening gear. A feature of this opening gear is the absence of all strain on the down rod, a specialty of Messrs. Mainzer & Farrar, rendering the gear entirely free in its working. Sections of more ordinary casements are also shown, transom lights, samples of mosaic-work and also specimens of metal-work employed for the construction of casements of solid bronze throughout, for the residence of the Hon. Mr. Allsopp.

William Woollams & Co.

Messrs. William Woollams & Co., of 110 High Street, near Manchester Square, have a beautiful exhibit of artistic wall-papers, embossed flock papers, raised flocks, &c., all of which are guaranteed free from arsenic; real embossed leather wall-drawings in continuous rolls, &c. The Pompeian decoration in raised flock by Mr. Owen Davis is a very handsome decoration suitable for staircases. A new design by Mr. A. Silver, made in chameleon flock with suitable frieze, is very rich in effect, the colour of the flock being beautifully gradated, and giving quite a velvety

effect. The Persian design on a very rich metallic ground is an admirable example of the height of perfection to which this form has attained in paper-staining. The "Chatsworth" design, by Mr. T. W. Hay, is another large and beautiful design, in a style with which Mr. Hay is well acquainted. The "St. Quentin" design, by Mr. Brophy, is a well-drawn pattern, shown in many colourings, and is a very suitable drawing-room paper. The "Londonderry," by Miss Aumonier, is an admirable production of this well-known lady artist, whose work in the ladies' section at the Chicago Exhibition was much appreciated. The design consists of hollyhocks and lace, and, being printed in very delicate colours, is a very taking pattern. Another specialty is the real leather shown by this firm, embossed and decorated. It is made in lengths the same as ordinary wall-paper and is 21 inches wide, and the joins of the skins are not noticeable. This new feature in wall-hangings ought to be seen by architects who have the decoration of mansions where an outlay on good decoration is not grudged. The "Digby," a private design of Messrs. Woollams, made in "Anaglypta," drawn by Mr. Owen Davis, is suitable for ceilings as well as dados. The "Talbot" is another handsome design in relief shown in various methods of decoration. This firm, as is well known, takes an important part in the advance in modern interior decoration, and at Chicago gained the highest awards, besides having previously gained eighteen other medals. They are the original makers of wall-paper free from arsenic, and will gladly guarantee any of their manufactures in this respect.

Peace & Norquoy.

Improved folding partitions for schools, public buildings, &c., are shown by Messrs. Peace & Norquoy, of 70 Port Street, Piccadilly, Manchester. The use of partitions for drawing-rooms, schools, and many other places, is as old as the hills. Of all troublesome and maddening things the various systems employed for subdividing rooms have been the worst. Once shut there is peace, but in opening them the trouble begins, and too often when open they are an encumbrance and unsightly. The system of Messrs. Peace & Norquoy certainly supersedes all other methods for dividing and subdividing rooms. By this means a large hall can be divided, or the partition, by an easy gliding motion, folded back against the wall in two minutes, without leaving any obstruction on the floor. These partitions have been approved and specified by architects in the erection of new schools,

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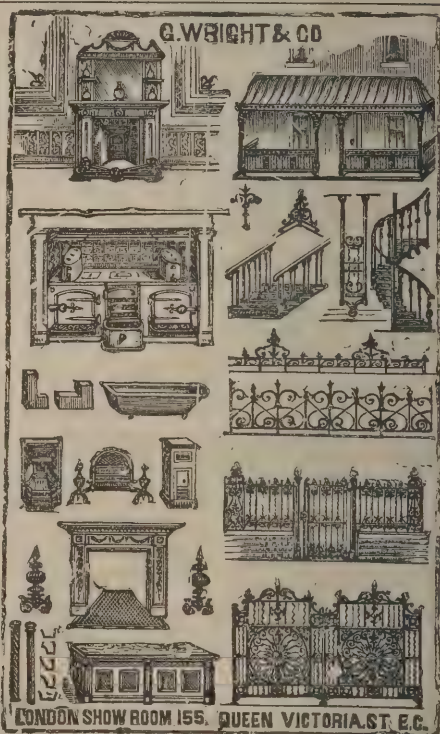
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and adopted by various school boards. These patent folding partitions are suspended by rods and pulleys, which run on rails fixed to a beam, and are made in 2-inch panelled and moulded framing, with wood or glass panels, in sections about 3 feet 6 inches wide, hinged together and fixed in position with steel-faced flush bolts. The full-sized partition shown consists of a series of folding sections. The sections are suspended from carriages which run upon rails as usual, but in place of the sections being disconnected they are hinged together, or the sections constituting the entire partition are divided into two or more sets, and the sections of each set hinged together. The sections are hinged together so that they can be folded one upon another similarly to an ordinary lap screen. It will be seen that the adoption of hinging the sections together is a very great improvement. If required, every alternate section can be made to act as a door. The sections can be made either with glass or entirely with wood panels, or the sections can be of iron or steel, which would also act as a fire-resisting partition.

Robert Adams.

At the stand of Mr. Robert Adams, 67 Newington Causeway, S.E., are shown the celebrated "Victor" door-springs, which we have before now described at length. Among these are the following:—The "London Victor" S.A. spring hinge, which opens and closes silently from the half-circle; the "Crown Victor," which is D.A., and opens and closes from the angle of 135 deg, which is wider than any other spring on the market; the "Empress Victor" pneumatic spring can be fixed either inside or out; the "King Victor," D.A., with check for exposed positions; the "Hurricane Victor" D.A. spring hinge, without check; the "Queen Victor," S.A., with silent check. The reversible windows are also shown, which are not only now well known, but should be more generally adopted for safety of those employed in window cleaning. Also the Triumph sash fastener and the Pullman sash balance, of which Mr. Robert Adams is sole agent; the universal sash-light opener, link motion fanlight opener, Giant sash locks and various other sash locks, Glide fanlight opener, pneumatic fanlight opener with a most handy and ingenious check; the Scott fanlight and skylight opener, &c., and sundry stoves. Among the door-springs is one of a novel description—a combination door-spring which can be regulated so as to keep the door from entirely closing, thus superseding the use of a strap. Aluminium tape is used with the Pullman

sash balance (steel frame). It should be noted that the top and side balances can be applied to mullioned windows, thus enabling the architect to introduce light where it is mostly needed. The spring sash balances are adapted for old as well as new work, and can be used in many places where you cannot use weights and cord. They are easily applied, run noiselessly, and have a very attractive appearance, lasting much longer than cord. If the directions are carried out every balance will work perfectly and be really indestructible. The balance can be applied to old as well as new windows. Also shown are Robert Adams's new panic door bolts, new "Impregnable" bolt, and a new "Impervious" weather-tight case-joint just now introduced, which disposes of condensed water by passing it outside.

W. Garstin & Son.

Visitors to the exhibition will naturally find a good deal to interest them in Messrs. W. Garstin & Son's exhibit of marbles and granites, not merely from the variety, but from the architectural purposes to which they are applied. Some of the granites consist of Scotch, Bavarian, Norwegian, Swedish, American and Italian. These are subdivided into different specimens from each country. Messrs. W. Garstin & Son call particular attention to their Italian granite, which is their most recent specialty. This granite comes from the quarries of Bareno, the original working of which goes back to the year 1560. The present proprietor, the Cavaliere Nicola Della Casa, has by his great enterprise succeeded in making Bareno granite famous in all parts of the world, and has been knighted by King Humbert for his services in the extension of the granite industry. The enterprise is now being extended to this country, and we have no doubt that in the hands of Messrs. W. Garstin & Son Italian granite will be widely used. This specialty is much cheaper than many of the stones in the market; it has great durability, is free from cracks, vents or other defects, will stand an unusual strain without breaking, whilst, being free from hornblende or soft parts, it is not affected by the action of the weather or the acid in the atmosphere of large towns. There is thus a large scope for Italian granite in work requiring particularly hard material, whilst columns, pilasters, &c., can be employed of considerably larger dimensions than hitherto. Messrs. W. Garstin & Son have quarries at Aberdeen, with complete plant for cutting and polishing all their granites, whilst all marble-work is executed at their London works, 760 Harrow Road, W. They are in a position

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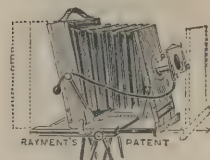
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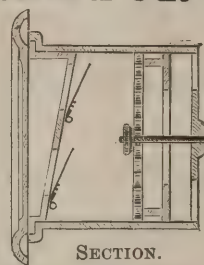
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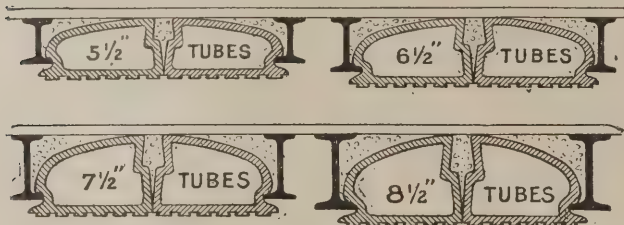
to quote for granite for bridge, dock, railway and other engineering works. The patent non-slippery pavement, shown as a granite stair-tread, will be referred to next week.

H. F. Buchan.

Mr. H. F. Buchan shows his patent "H. F. B." brass traps and fittings, which are generally recognised in the trade as a great improvement on old methods, and plumbers' brass fittings of every description. The "H. F. B." sink trap is claimed to be the only perfect fitting for earthenware and other sinks, and being cheaper than lead saves its cost in fixing. There is a saving of two plumber's joints, too, by using the "H. F. B." for lavatory basins. The latest specialties shown are patent connections for connecting earthenware closet-traps to lead soil pipe, and another pattern doing away with a wiped joint. Mr. Buchan seems to have paid special attention to everything new in the brass trade, and from the fact that these improvements are the very latest, deserve the notice of visitors to the exhibition.

Ferguson & Sons.

Messrs. S. Ferguson & Sons have a large exhibit of the "Carlisle" fireproof and ventilating floor. The main claims are lightness and strength—advantages which are at once apparent and real, and have gained the approval of leading authorities on the subject of construction. Describing the "Carlisle" system briefly, the floor is composed of the ordinary steel or iron joists and a combination of fireclay tubes and



concrete. The joists are placed at from 2 to 3 feet centres, and the tubes are 12 inches, 13 inches, 14 inches, 15 inches and 18 inches wide, two being put together to bridge over the space between joists, and concrete being filled in between them, which forms a key to bind the two lines of tubes together. The

tubes run parallel with the joists, and the tops of each pair of tubes being segmental or semi-elliptic, the concrete encasing them forms a corresponding arch springing from the bottom flange of each joist. This arched construction of fireclay is capable of carrying three tons concentrated upon the square foot on the crown of the arch. This idea of the "Carlisle" emphasises its characteristic of lightness and strength; and another advantage we may refer to is the protection to ironwork which the floor affords—that is, including plaster, 2 inches protection to the underside of the iron or steel joist, with an air-space to promote radiation, or to intercept the conduction of heat to the ironwork. We do not intend to satisfy the curiosity of intending visitors to the exhibition on every point and detail. We would invite them to inspect the exhibit if they are at all interested in fireproof floors. We are sure that a careful examination of it will confirm the merits of the "Carlisle" as one of the best floors in the market, and soon, we hope, to be largely adopted.

Kingston Flush-Tank.

The Kingston patent "Silent" flush-tank is decidedly a novelty, and on an entirely new principle. The tank is constructed of cast-iron, the working parts of gun-metal. The lid is secured with four screw bolts upon a rubber seating, making a perfectly air-tight tank. There is no ballcock or overflow pipe used, consequently overflow is prevented. The valve is fitted with a screw propeller which the rush of water causes to rotate, consequently the valve frees itself from corroding deposit, and, by its varying position, makes a true watertight connection with its seating. This invention is certainly well worth attention.

Williams & Son.

Messrs. J. C. Williams & Son are well represented with a display of their improved close fire ranges of different patterns, radiators, manhole covers and general ironmongery. With the present rage for fads in ranges it is to the point to call attention to a range that is simple in construction, not made for effect, but for wear, and can be easily managed. All the portions of the range most subject to the action of the fire, such as the front bars, cheeks, bottom grate, are exceedingly strong and movable, and can be replaced at a small cost without taking out the range. The distinct specialty is, however, Messrs. J. C. Williams & Son's winding bottom grate arrangement,

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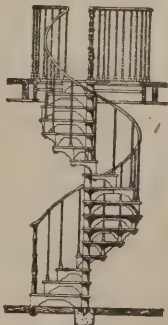
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HAYWARD'S

CIRCULAR AND STRAIGHT.



Stock Sizes.

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3 ft. 6 in. dia.

4 " 0 " "

4 " 3 " "

4 " 6 " "

5 " 0 " "

5 " 6 " "

6 " 0 " "

Stock Sizes.

STRAIGHT.

2 ft. 0 in. dia.

2 " 4 " "

2 " 8 " "

3 " 0 " "

3 " 4 " "

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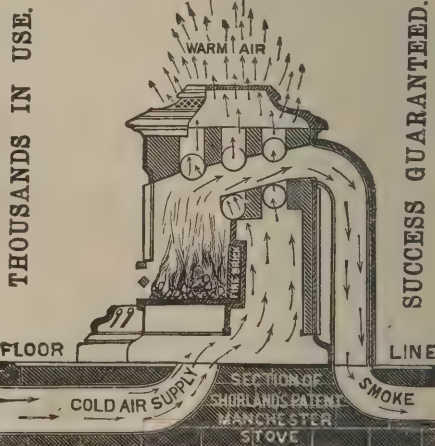
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MANCHESTER STOVE

Made in various Designs and Sizes, with Tiled
or Iron Sides, Single or Double Fronted, and
with Ascending or Descending Smoke Flue.



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which the down-draught arrangement, as now shown,
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England, &c., &c.

Drake Street Works, Stretford Road,
MANCHESTER.

Shorland's Inlet and Outlet Ventilators in
every Design.

which allows the fire to be raised or lowered, and effects considerable economy. We may remark that Messrs. J. C. Williams & Co. are actual manufacturers, and for over eighty years have been established at Reading, and acquired a reputation for high-class work. Amongst recent work the firm have placed ranges, &c., in the residence of the Duke of Wellington, at Apsley House and Strathfieldsaye, and carried out specifications from Mr. Alfred Waterhouse, F.R.I.B.A. Hot-water engineering work is another specialty of the firm. We shall refer in a subsequent issue to other details of the exhibit.

John Sutton.

Mr. John Sutton, of Peterborough, shows his patent chimney-cowl, which is claimed to be a preventive of down-draught—a claim which we think is perfectly justified. A system of sectional plates easily acted upon by currents of air from any direction attain this object. In another column will be found an illustration of this cowl, from which its merits will be easily gathered. Messrs. Seagrave & Co., Rochester Row, Westminster, are the manufacturers in London.

Cunnah-Wright Construction Company, Limited.

The Cunnah-Wright Construction Company, Limited, are to the fore with their system of construction in the form of a model bungalow, which is particularly light and attractive. We shall refer in a subsequent issue to this exhibit in more detail.

Ellis & Partridge.

A fine selection of ornamental brickwork is shown for Messrs. Ellis & Partridge by Mr. T. Freeman, of 200 and 202 Phoenix Street, St. Pancras, N.W., which will be fully described in our next issue.

T. Freeman.

Messrs. P. & S. Wood's blue Staffordshire bricks, copings and tiles are shown at this stand. The goods are made from the very finest of the rich silicious clay deposits in the Staffordshire district, without the admixture of any foreign or colouring matter whatsoever, and enjoy a high-class reputation in the English and foreign markets. The goods are guaranteed vitrified and coloured solely by the application of a sufficient and continued degree of heat, and necessarily vitrified throughout, in order to impel to the surface and flux the oxide of iron which forms a large natural constituent of the material, to produce the hard metallic face, and impart the rich natural

colour, for which the Staffordshire brick is so justly celebrated. The bricks have been tested. One indiscriminately taken from bulk (not specially prepared), treated by Messrs. Kirkaldy, of London, withstood a gradually increased thrusting stress to 438,940 lbs., and a mean average of six bricks so treated showed 380,108 lbs., or 9,507 lbs. on the square inch. These same bricks were previously immersed in water for twenty-four hours, and only gained by absorption 0.80 lbs., or 1.48 per cent. of their weight. They are non-absorbent and practically imperishable.

H. Bassant.

Mr. H. Bassant, West London Parquet Works, 87 Charlotte Street, Fitzroy Square, W., shows a high-class selection of parquet flooring, $\frac{1}{4}$ and $\frac{1}{2}$ -inch parquet, to cover existing floors, also 1-inch solid oak parquet. We understand they keep about 50,000 feet of various designs always in stock and ready for laying. The designs shown in the hall will repay inspection. As to methods of fixing parquet floors, Mr. Bassant guarantees all work fixed by his own workmen to be well glued, both tongued and grooved and secret nailed, and to be firmly fixed to existing floors and guaranteed not to move. Also $\frac{1}{4}$ -inch parquet to be firmly fastened to existing floors, and warranted not to curl up.

THE MANUFACTURE OF WHITE LEAD.

Two patents have been recently taken out which are intended to counteract, if possible, the ill effects which frequently overtake people employed in the manufacture of white lead. The object of the patents is to dispense with the direct handling of the lead from first to last by workers of the Dutch process. This is effected by what the inventor calls "the tray system," which may be applied both in the "stack," where the blue lead is converted into carbonate of lead, and in the "stove," where the ground white lead is dried. As it is in the "stove" and in the subsequent packing into casks of the dry white lead where the most poisonous effects are experienced, a brief description of the proposed new method may be of interest. The lead is transferred from the pots in the "stack," in which it has been converted into carbonate, by means of suitable tools, which avoid the direct handling of the lead, to boxes held in position on what are termed tipping trays. These are placed on trucks, which run into the grinding shed, where the boxes are unloaded by "tipping" into a hopper which feeds the grinding rolls.

HOWARD & SONS,

25, 26, 27 BERNERS STREET, W.,

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FLOORING

Of Finest Quality,

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Tender for Contracts for any Joiners' Work or Ornamental Plaster. Painting—Plain or Decorative.
Wrought-Iron Work. Stained Cathedral Glass, and any other Interior Work.

Each tipping tray is of a size to accommodate twelve or any other suitable number of boxes, which are clamped by cross-bars or other means to keep them in position when the tray is tipped or inverted. The shed is built as nearly air-tight as possible, is lighted from the sides and top, and has connected with its upper part an exhaust outlet to a fan, which draws off any dust that may arise in the operation of tipping, and leaves the atmosphere breathed by the workers untainted. The tipping is effected by causing the tray carrying the boxes to pivot upon a suitably supported horizontal axis at its front, and raising it off the truck by means of chain or other tackle attached to its rear, or otherwise applied to tilt it, until it is inverted over the inclined mouth of the receiving hopper. Water is sprayed upon the white lead as it is delivered to the hopper to prevent as far as possible the escape of dust, and to assist in conveying the white lead to the grinding rolls. The ground white lead is then filled into earthenware or copper pans, secured on trays and transported to the drying stove. This is a shed with pairs of supporting ledges arranged in superposed tiers to receive the trays. These ledges may be fixed to the side walls of the shed and to intermediate posts, and two or more series of tiers can be arranged side by side. Beneath each series is a tramway, upon which run waggons for depositing the trays on or removing them from the ledges. For this purpose each waggon is provided with an elevating table capable of being raised or lowered by a central screw, and in this way several tiers of ledges are brought within range of one waggon, several waggons of different heights being used. The loading of the drying stove is commenced by first raising the elevating table, so that the tray is just above the level of the uppermost pair of ledges, then running the waggon into the stove, lowering the table so that the tray rests on the ledges, and then running the empty waggon out. The operations are then repeated for placing trays on the ledges next below, and so on in succession. A turntable is provided opposite each entrance to the stove and sidings for the waggons not in use. The stove is divided into two storeys, similarly arranged and worked, the trays being raised by a crane to the waggons running on the tramways of the upper storey. When the drying is completed the trays are removed by running the waggons under them and lifting them off the ledges, beginning, of course, with the lower tiers. The trays are then transported to the packing shed. This, like the one before described, is closed on the four sides, lighted from the top and sides, and provided with an exhaust by which dust particles are drawn off into a receiver. A tipping

arrangement similar to that already described is provided, by which the trays are tipped so as to discharge the contents of the basins into a hopper. This hopper has a regulating slide, operated from the outside, by which the flow of the white lead into the casks placed to receive it is controlled. The empty and loaded casks are passed in and out of the sheds on trucks, and the cask while being filled is lifted by counter-weighted suspension gear, to which a tremulous motion is continuously imparted by a revolving cam shaft, to press the lead tightly into the cask. The suspension gear may consist of counter-weighted lever arms, carried by a sling attached to an overhead lever, upon which the cam acts, the arms being adapted to take under the bottom of the cask, and being so guided that they may be readily engaged or disengaged as required. The cask when filled is deposited on its truck, drawn out of the shed, and passed to the cooper to be headed up.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 4594. James Henry Jefferies, for "Improvements in bib and stop-cocks for water, petroleum, other liquids and steam."
- 4623. Thomas Lishman, for "Improvements in or applicable to chimneys and ventilating shafts."
- 4694. Christopher Francis Gough, for "Improvements in bib-cocks or valves."
- 4693. Edgar John Lording, for "An improved sash-fastener."
- 4708. John Chadwick, for "Improvements in or relating to chimneys and the like."
- 4723. Henry Harris Lake, for "Improvements in automatic fire-extinguishers."
- 4766. Edwin Harry Francis, for "Reversible safety window."
- 4785. John Robinson, for "Improvements in apparatus for domestic fireplaces."
- 4802. John Edward Foxlee, for "Improvements in valves."
- 4868. Francis Bennett Shuffrey, for "Regulating draught-plate."

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THE

Architect and Contract Reporter.

SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

*: As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GILLINGHAM.—April 6.—Alternative Designs are invited for a School in Three Departments. Mr. E. T. Atchison, Local Board Offices, Gillingham, Kent.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

LONDONDERRY.—May 1.—Plans are invited for proposed Baths and Washhouses. Mr. Robert N. Chambers, Guildhall Londonderry.

CONTRACTS OPEN.

BECCLES.—March 31.—For Erection of a Tank for Gas-holder and Retort House, and a Building for the Governor. Mr. C. F. Parker, Gas and Water Company, Beccles.

BURTON-ON-TRENT.—April 5.—For Building Infectious Diseases Hospital. The Borough Surveyor.

CARDIFF.—April 11.—For Building Head Post Office. The Secretary, H. M. Office of Works, 12 Whitehall Place, S.W.

CARLISLE.—April 5.—For Rebuilding Presbyterian Church in Fisher Street. Mr. T. Taylor Scott, Architect, 43 Lowther Street, Carlisle.

CROYDON.—April 3.—For Supply of 13,000 Feet of Norway Granite Kerb and 100 Tons of Norway Granite Setts. Mr. W. Powell, 8 Catherine Street, Croydon.

ESHER.—April 4.—For Erection of Five Cottages and Building Additions to the Sewerage Works. Mr. James Edgell, Gate House, Portsmouth Road, Kingston-on-Thames.

GLASTONBURY.—March 30.—For Erection of Police Buildings. The County Surveyor, 1 Belmont, Bath.

HENDON.—April 2.—For Construction of about 940 Yards of Tar Pavement, with Kerb, &c., at Redhill, Edgware. Mr. F. J. Seabrook, Edgware.

HORNCASTLE.—April 7.—For Restoration of Hameringham Church. Mr. C. Hodgson Fowler, F.S.A., Architect, Durham.

ISLINGTON.—April 2.—For Paving with Creosoted Deal Blocks a portion of Holloway Road, and Paving a portion of Grove Road with Granite Setts removed from Holloway Road. Mr. W. F. Dewey, Vestry Offices, Upper Street, N.

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LEICESTER.—April 3.—For Preparing the Site, the Construction of a Concrete, Puddle and Earthen Dam or Embankment for a Storage Reservoir to contain about 500,000,000 Gallons and for Road Diversions, the Tunnel Outlet and Valve Tower and Valve House in connection with the Swithland Reservoir. Mr. J. Beverard, M.I.C.E., 6 Millstone Lane, Leicester.

MANCHESTER.—April 4.—For Building Inland Revenue Office. H.M. Office of Works, 12 Whitehall Place, S.W.

MILLBROOK.—April 2.—For Building Board School, House, &c. Mr. A. F. Gutteridge, Architect, 9 Portland Street, Southampton.

MOSS SIDE, MANCHESTER.—April 10.—For Construction of Tanks, &c., at Sewage Farm, Urmston. Mr. J. Bowden, C.E., Engineer, Manchester.

NEATH.—April 2.—For Alterations to Board School. Mr. T. C. Wakeling, Architect, Merthyr.

RAMSGATE HARBOUR.—March 31.—For Erection of a Wooden Landing-stage at East Pier Head. Mr. C. Cecil Trevor, Board of Trade and Harbour Department.

REDDISH.—April 9.—For Constructing about 3,200 Yards of Pipe Sewers. Mr. McCallum, Engineer, Manchester.

ROMFORD.—March 31.—For Supplying, Laying and Fixing Paving, Kerbing and Channelling in the Romford Market, and for Supplying, Laying and Fixing Paving and Kerbing in various Roads in the District. Mr. George Bailey, Romford.

ROMNEY MARSH.—March 30.—For Supply of 3,000 Yards of Rock for Dymchurch Sea Wall. Mr. Edward Case, New Hall, Dymchurch, Kent.

SHEFFIELD.—March 31.—For Excavation and Construction of Concrete and Brick Foundations for Proposed New Buildings, Liquor Tank, &c., at the Grimesthorpe Station of Sheffield Gas Light Company. Mr. Hanbury Thomas, Commercial Street, Sheffield.

SHEFFIELD.—March 31.—For Erection of a Boiler-house at the Neepsend Station of Sheffield Gas Light Company. Mr. Hanbury Thomas, Commercial Street, Sheffield.

TONBRIDGE.—April 4.—For Erection of New Post Office. Mr. I. Tosh, Architect, Redhill.

ULDALE.—April 5.—For Erection of Grammar School. Mr. A. W. Johnston, Architect, 27A English Street, Carlisle.

WAR OFFICE.—April 2.—For Triennial Contracts for Repairs and Materials at the various District and Sub-District Stations. Mr. G. Lawson, War Office, Pall Mall.

WREXHAM.—March 31.—For Laying Down about 10,000 Yards of Tar or Asphalte Paving. Mr. J. W. M. Smith, Borough Surveyor.

TENDERS.

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For Repairs at No. 63 Kidbrooke Park Road. Mr. H. PERCY MONCKTON, F.R.I.B.A., Architect and Surveyor, 32 Walbrook, E.C.

WALTER B. BRIANT (*accepted*) £115 0 0

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For Erection of House, Westbourne Park Estate. Messrs. H. E. HAWKER & MITCHELL, Architects.

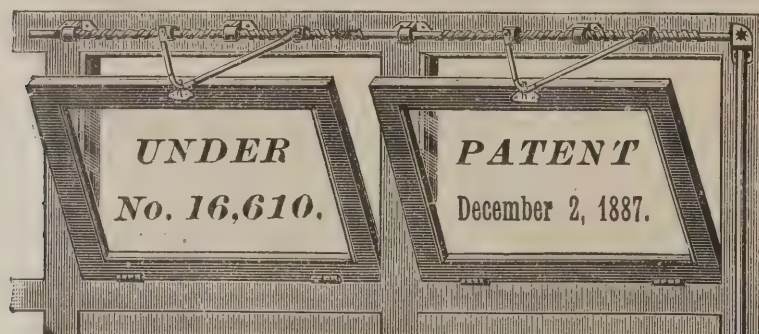
Shears	£1,000 0 0
Rigler	985 0 0
W. Jones & Son	950 0 0
Entwistle & Cox	890 0 0
W. Hoare	850 0 0
Masters	850 0 0
F. Walden	846 0 0
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F. HOARE & SON (<i>accepted</i>)	746 0 0

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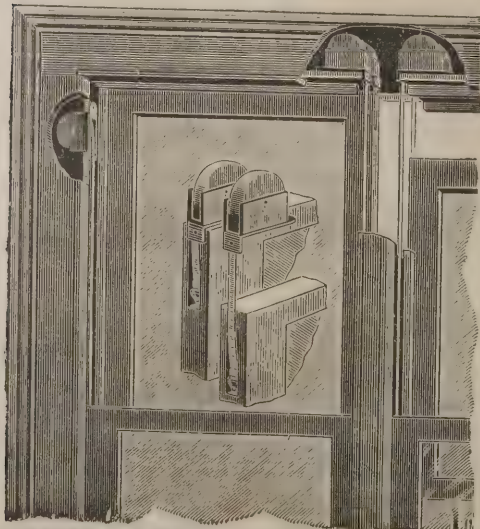
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C. E. Skinner . . . 2,340 0 0
Callund & Son . . . 2,295 0 0
J. G. NAYLAR & SON (accepted) . . . 2,281 0 0

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J. Dickson . . .	11,330	9,797	21,127
B. Cooke & Co. . .	11,450	9,450	20,900
G. Osenton . . .	11,372	8,985	20,357
W. Cunliffe . . .	11,493	8,602	20,095
J. JACKSON, Plaistow (accepted) . . .	10,900	9,300	20,200

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T. GODWIN, Hanley (accepted) . . .	639 0 0

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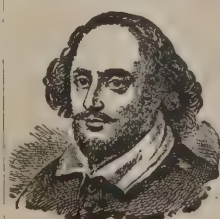
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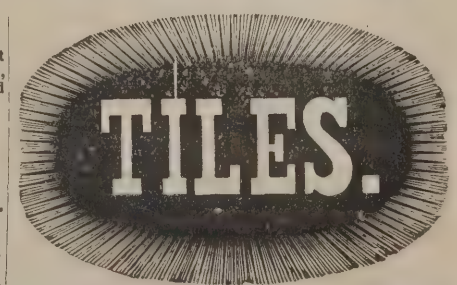
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For Erection of Infants' School for 185, Covered Playgrounds, Walling, &c., at Upper Dovercourt, Essex, for the Harwich School Board. Mr. J. W. START, F.S.I., Architect, Cups Chambers, Colchester, and Main Road, Harwich. Quantities by Architect.

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F. Bennett, Ipswich	1,645 11 9
J. Moran & Son, Harwich	1,575 0 0
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E. S. Gunn, Harwich	1,544 4 5
Kerridge & Shaw, Cambridge	1,496 6 0
W. E. French & Co., Sandy, Beds	1,489 0 0
S. Parmenter, Braintree	1,465 0 0
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E. SAUNDERS, Dovercourt (accepted)	1,277 0 0
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Cost of School Buildings, £790. Cost per head, £4 5s. 5d.

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Cost of Boundary Walls, Playgrounds, &c., £271.

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Wm. Smith, Camberwell	2,586 0 0
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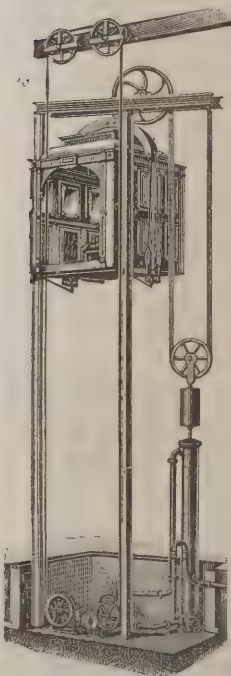
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For Drainage Works at Union Workhouse.

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For Sewerage Works at Barton. Messrs. PICKERING & CROMPTON, Engineers.

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For Cleaning Interior, Repairing and Painting Exterior of Churchfield Schools, for the School Board for Woodford, Essex. Mr. E. TIDMAN, C.E., F.S.I., M.S.A., Architect to the Board.

J. Riley, Woodford	£154	12 0
F. Ranger, Woodford	145	5 0
T. OSBORN & SON, Woodford*	132	5 0

* Accepted subject to slight modification.

THE value has been sworn at 102,093½ of the personal estate of the late Mr. Thomas Hawksley, civil engineer, who was born in Nottingham in 1807, and carried out waterworks and gasworks at Liverpool, Leeds, Leicester, Derby, Nottingham, Rochdale and other towns. Mr. Hawksley, who died on September 23 last, devises and bequeaths all his real and personal estate whatsoever and wheresoever to his son.

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TRADE NOTES.

A LARGE clock has just been erected at the parish church, High Ham, Somersetshire, by Messrs. John Smith & Sons, Midland Clock Works, Derby. It has all the latest improvements and is guaranteed to keep very correct time. The dial is a square one of special design. The same firm have also just completed a similar clock at Corsley parish church, Wilts.

THE new offices for the Consett Iron Company, Blackhill, co. Durham, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE regret that last week, through an error, the new address of the Homacoustic Speaking Tube Company read 6 Burton Street. It should be 6 Bruton Street, W.

MESSRS. HAM, BAKER & CO., of 13 Grosvenor Road, Westminster, S.W., have been appointed sole agents for the sale of Ruscoe's patent apparatus for drilling and tapping water mains under pressure, and inserting ferrules without shutting off or wasting water.

VARIETIES.

THE Worthing Town Council have at last decided upon a site for obtaining their water-supply. Eight alternative sites had been submitted by experts to the committee, who had selected three for the choice of the Council. At a meeting of the Council the choice fell upon a site near the chalk pit at Broadwater. It was decided to purchase seven acres from Colonel Wisden for 1,400l., with permission to construct adits as the consulting engineer, Mr. Mansergh, may advise.

THE Banstead Wood Estate has been sold privately. The mansion, which was built a few years ago from the designs of Mr. Norman Shaw, has cost about 60,000l. The estate has an area of about 486 acres, of which some 300 acres are in wood.

THE Local Government Board have sanctioned the proposal to borrow 10,000l. for sewerage at Wilmslow, near Liverpool.

AN exhibition of arts and industries has been opened in the Ulster Hall, Belfast, and will not be closed for nine weeks. The collections are varied.

ON a Brooklyn quay, in the case in which it came from Rome, and perhaps one day to be sold for freight and customs charges, lies a colossal piece of sculpture, the greatest effort

(says Mr. Lewis Fraser in *The Century*) of an art life of over twenty years, a life spent in hard study in America, France, Italy and England by a man whose artistic intuition can hardly be said to be second to that of any of America's sculptors. This statue, *The Spirit*, modelled by John Donoghue in Rome, was intended for exhibition at the World's Fair, but such a work calls for large outlay in material, models, castings, &c., and with the shipping of the statue Donoghue's resources were exhausted. There was no one to pay for its transportation to Chicago.

JOSEPH WHITEHEAD, said to be the oldest railroad contractor in Canada, died at Lincoln, Huron county, Canada, on March 12.

THE Poole Town Council have decided to form a committee in order that they may suggest means for marking and commemorating notable places, persons and facts in connection with the history of Poole.

A NEW church for the Wesleyans at Wolstanton, Staffordshire, is about to be erected from the designs of Mr. A. R. Wood, of Tunstall, selected in a recent limited competition.

THE Most Rev. Dr. Sheehan, Roman Catholic Bishop of Waterford, has resigned the presidency of the Cork Archaeological Society, and the members have passed a vote of thanks to him for his interest he took in their work.

THE pre-eminence of the position occupied by the Empire Theatre in the affections of the public has again been demonstrated, if such evidence be needed, by the crowds which have flocked to it during the Easter holidays. They went in the confident expectation of finding a good evening's entertainment awaiting them, and must have been hard indeed to please if they did not come away satisfied. The holiday programme comprises fourteen items, and among them there is not one which is not first-class of its kind, while their variety adapts them to all tastes. Among the artistes who appear in the course of the evening are such well-tried favourites as Paul Cinquevalli, Marie Lloyd, Charles Tilbury and Clara Wieland, and among the new-comers the "Avolo Boys" execute some remarkable gymnastic feats, the Ray-Nols are aptly described as "eccentric French duettists," the Russian Liliputian singers and dancers throw plenty of energy and grace into their performance, and the "Three Judges" give an acrobatic turn which possesses many new features. The two ballets, "Katrina" and "The Girl I Left Behind Me," retain their freshness and "go," and the "Living Pictures," of which there are no fewer than fourteen, are alone worth a long journey to see.

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BUILDING AND BUILDERS.

THE new Credon Road schools, for the West Ham School Board, of which Messrs. Newman & Jacques are architects, will cost at least 20,000/.

LAUGHTON CHURCH, near Gainsborough, is about to be restored at the cost of Mrs. Meynell-Ingram, of Temple Newsam.

A NEW factory is about to be erected at a cost of 12,000/ for Messrs. Martineau & Sons in North Woolwich Road, Victoria Dock, from designs by Mr. W. P. Ryan.

MR. J. STATHAM DAVIS, architect, Birmingham, has in course of erection sixteen large villa residences and twelve smaller ones at Edgbaston and Sparkhill respectively (Birmingham); forty workmen's dwellings at Garrison Lane, Birmingham; a number of villas of varying sizes at Sutton Coldfield, and semi-detached labourers' cottages at Bromsgrove. These buildings are being erected by various contractors, and the style adopted is Gothic. The total cost is estimated at about 25,000/.

THE governors of the Ludlow Grammar School are about to erect new buildings at Gravel Hill, or on a site in Mill Street.

SIR A. BLOMFIELD is expected to submit sketch plans of the new West Sussex Asylum to the County Council at the meeting in May. The buildings are likely to be less extensive than originally proposed.

THE directors of the South-Eastern Railway Company have decided forthwith to extend their locomotive and engineering works at Ashford, Kent. The expenditure will be large.

THE Grand Hotel, Birmingham, is now being extended under the direction of Messrs. Martin & Chamberlain, at a cost of about 60,000/., by Messrs. Barnsley & Son.

NEW CATALOGUE.

THE illustrated catalogue of the "Gordon" duplex steam-pumps which Messrs. Hayward Tyler & Co., of Whitecross Street, have prepared is interesting for several reasons—one being that the firm have been able to demonstrate the superior efficiency of their pumps beyond the best of the foreign rivals. The pump, as is well known, is adapted not only for the water-

supply of buildings and as a means of protection against fire, but for many other purposes. It can be made to work lifts, cranes, and these adaptations are available for almost every occasion on which pumping machinery is required. The catalogue suggests the sizes and varieties of the duplex pump and, considering the quality of the work, the economical prices at which orders are executed. The reputation of Messrs. Hayward Tyler & Co. for hydraulic work is endorsed by the foremost engineers and architects. In the catalogue they have introduced an ingenious telegraphic code, which by itself suggests the system adopted in the offices of the firm. This peculiarity is worth the attention of philologists as well as men of business, for by means of it the labour of correspondence is minimised, errors in description become impossible, and the delays that are unavoidable with letters are avoided.

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BANNISTER, T., 66 Ovenden Road, Halifax.
BARRATT, A., Brandy Hole, Greetland, Halifax.
CARRELL, J., 12 Gainford Street, West Hartlepool.
FERRIDAY, J., 38 Copperfield Street, Toxteth Park, Liverpool.
FORREST, R., 13 Swainson Street, West Hartlepool.
FOSTER, W., 67 Durham Street, East Hartlepool.
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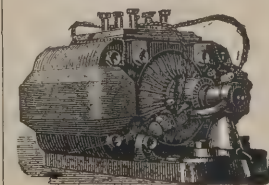
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TUNNELLING IN EDINBURGH.

AN important part of the extensive scheme now in progress for improving the Waverley Station and its approaches is, says the *Scotsman*, the construction of a new tunnel to carry a double line of rails between the west end of Princes Street Gardens and the Haymarket. It, in point of fact, has been laid down parallel with the existing tunnel, from the south side of which it is only separated by an average distance of 20 feet. It is 1,012 yards in length, 18 feet 6 inches in height from the rail level to its inner crown; it has a diameter of 27 feet. The work, which has been going on steadily and most satisfactorily—not a hitch of any moment having occurred since the start—is expected to be finished about the month of August. At present the tunnel is being worked from three different points, and the state of the record shows thus:—From St. Cuthbert's Churchyard westward, 64 yards of covered way and 72 yards of tunnel have been built; from the Torphichen Street shaft eastward 380 yards, and westward 152 yards, have been constructed; and from the west end of the tunnel at Dalry Road eastwards there are 28 feet of covered way and 52 yards of tunnel executed. These figures give a total length of 748 yards dealt with, leaving 264 yards still to be tackled. Workmen are now working on four "headings," and the work proceeds at an average rate of about 30 yards a month. The tunnel, which runs at an average depth of about 20 feet below the street level, is constructed of concentric rings of brick, the number running from 4 at the ends where there is no great weight upon it to 6 and even to 8 in the centre, where the pressure from houses is great. These brick rings are firmly cemented together, and, to make the tunnel watertight, holes are left in the roof at certain distances, and through these cement grout is forced all round the outside of the brickwork at a pressure of 68 lbs. to the square inch. At certain points, also, where the tunnel has to carry a heavy weight, the solid oak beams with which the roof was timbered before the brickwork was built have been left in and bricked round so as to strengthen the tunnel overhead. There are manholes at a distance of 50 feet on each side of the tunnel, so arranged as to give an alternate manhole at every 25 feet. Three of the heaviest buildings the tunnel passed through were St. Mark's Church, the south end of the Caledonian Station, and the Torphichen Street Police Station. St. Mark's Church had to be underpinned, and now rests securely on brick pillars carried to the rock. In putting in the foundations

of the Caledonian Station at the south end special provision was made for the passage of the tunnel underneath by laying down beneath the foundations a strong bed of concrete, while at the Torphichen Street Police Station, so well apparently had it been built, and so careful were the contractors in tunnelling under it, that not a crack has appeared along its walls. The most of the property likely to be affected by the tunnelling operations was purchased beforehand by the railway company. The damage done to the buildings, however, along the route is very slight. It can be easily repaired, and though the tenants of all the houses went out as a precautionary measure—a good deal of blasting having to be undertaken—they are now returning to those properties under which the tunnel has passed. The tunnel itself, for the most part, is well founded on rock. A remarkable diversity of material was met with in making the tunnel, which was mined in the ordinary way, and not, as those at the Mound, pierced on the shield system. At the east end the rock met with was a hard burnt sandstone, and at the heading from the east end of the tunnel this is being attacked by diamond drills driven by compressed air. In the centre in working from the Torphichen Street shaft beds of blaise or dry oilless shale had to be passed through, while at the west end a sandstone resembling the Hailes stone was encountered. Besides these other interesting deposits were met with. At the east end there was a fine band of fireclay excavated. Red marl was got under St. Mark's Chapel, and beds of coal, several inches in thickness, were also disturbed. In the blaise beautiful fossils of ferns and fishes were found. At the commencement of the work in the centre of the tunnel there were originally two shafts, one at St. Cuthbert's Lane and the other still in use at Torphichen Street. These it is proposed to convert when the tunnel is finished into ventilating shafts, and it is likely that the two tunnels will be connected at these points, so as to admit of the old Haymarket tunnel enjoying the benefit of ventilation also. The new tunnel has a gradient of 1 in 610, falling towards the Waverley Station. At the Haymarket end it comes out with a skew arch at an angle of 42, adapted to the line of the street above, and in the roof of the tunnel here may be seen two sets of iron troughs which had to be put in to carry the water, gas and sewage pipes of the city. The contractors for the tunnel are Messrs. George Lawson & Son, Rutherglen, with Mr. Laing as resident engineer. For the railway company Messrs. Carswell & Bell, engineers, are directing operations, with Mr. William Rodger as local engineer.

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ZINC AND ZINC ROOFING.*

I WISH, gentlemen, to give you what I believe to be the exact truth about zinc, mentioning both good and bad points in connection with it, and may I ask you clearly to understand that in speaking of defects I do not believe that zinc is more liable to them than any other material we have to do with. On the contrary, I believe that good zinc properly laid is less liable to defects than most other roofing materials. I shall simply mention defects that we may know how to avoid them. I believe that the best zinc is that manufactured by the Vielle Montagne Zinc Company. Without exception all publications that deal with the subject are agreed upon this point. Upon the first introduction of zinc into this country in 1844, the trades with which it was likely to interfere used every exertion to prevent its use. The workmen employed in laying it, being chiefly tinmen, were incompetent to the task, and care was not taken to use good zinc of sufficient thickness. The Vielle Montagne Company in 1861 took steps to improve the quality of the metal used in this country, and to prevent the use of thin gauges, also to improve the mode of laying zinc roofs. The ordinary commercial name of zinc, before it is converted into sheet and other forms, is spelter. I understand from the "Dictionary of Architecture" that zinc was perhaps first mentioned in the sixteenth century under the name of zinctum.

The principal ores from which the metal is obtained are the sulphide of zinc, more familiarly known as blende or black jack; the carbonate or silicate of zinc, also called calamine; and zinc spar and the red oxide or zinc ore. I have seen the ore in its natural state and the material after passing through the process of manufacture, though I have not actually witnessed the process myself. I read, however, that chiefly the sulphuret and carbonate of zinc is obtained by distillation by descent. The ore is roasted with charcoal and heated in peculiar retorts, and zinc is converted into vapour, condensed and then fused. The process of obtaining the zinc from the ore is fully explained in Gwilt's "Encyclopædia." Zinc is found in all quarters of the globe. It usually contains an admixture of lead and sulphur; when purified from these it is of a light blue colour, between lead and tin. Most of the zinc used by us comes from Belgium.

* A paper read before the Northern Architectural Association, at the Art Gallery, Newcastle, by the hon. sec., Mr. Arthur B. Plummer, F.R.I.B.A., surveyor for the diocese of Newcastle.

The ores are also found in Derbyshire, Cornwall, Flint and elsewhere in this country. In the Isle of Man zinc ore is called black jack. It is imported as calamine from Spain and the United States, and in the metallic state, either crude in cakes or rolled into sheets, from Germany, Holland and Belgium. Some of the Vielle Montagne Company's works are about 2½ miles from Liège, and the less important Nouvelle Montagne are about 10 or 12. The Vielle Montagne Company, in a pamphlet issued by them in 1893 in connection with the Chicago World's Fair, state that the number of men employed at the Company's various works and mines was 7,301. The metals with which zinc is naturally associated and which tend to destroy its malleability are iron, lead, arsenic and sulphur.

It is of great importance that it should contain no iron or lead; the Vielle Montagne zinc is practically pure and is also more ductile than other makes. Their spelter upon being analysed is found on an average to be practically pure and is as follows:—Pure zinc, 0.995; traces of iron, 0.004; lead and sulphuret, 0.001. Zinc is easily fusible and malleable when pure, and bad zinc is soon destroyed by air containing acid. Cast zinc is brittle when cold. If pure, it becomes malleable at about 20 degs. Fahr., and can be rolled into sheets which retain their malleability, as may be seen by the corner of one of the samples submitted which I have struck with a hammer. At very high temperature, such as 400 degs. Fahr., it becomes very brittle again. The presence of lead makes zinc too brittle to roll at any temperature, and should it contain more than about 1 per cent. of lead, should be rejected. Zinc should be cast at a low temperature or the metal will become very hard and some of it will pass off in vapour. A small percentage of iron renders most of the spelter, particularly English, unfit to roll. Zinc is of a light bluish-white colour with a brilliant metallic lustre; it slowly tarnishes in the air, but only superficially, the film protecting the metal from further oxidation.

Though naturally very brittle, it may, I understand, easily be rendered quite malleable and ductile by being subjected to a process of lamination. Zinc is more tenacious than lead; it is equal to five times the same substance in lead and about three-fourths of copper. The density of zinc is 7.190, that of lead 11.352. Hence a given substance of zinc is one and a half times lighter and four times more resisting than the same substance of lead, or, in other words, zinc is as strong as lead at a quarter of its thickness. Rain-water coming off a zinc roof may be collected for domestic use without fear of poison, as it does not contaminate water as lead or copper are apt to do.

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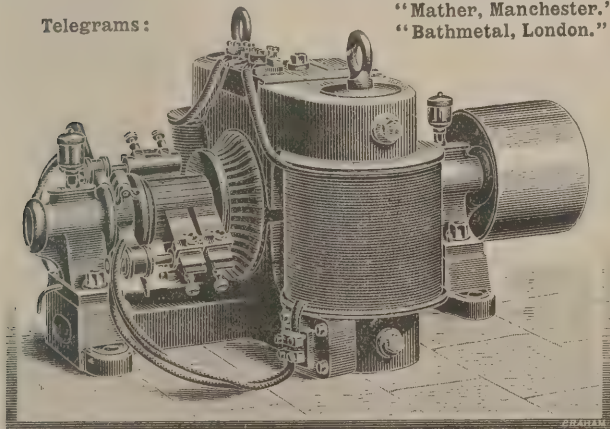
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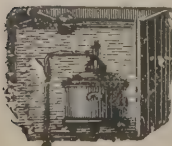
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I may mention, however, that water containing lime destroys the zinc; therefore cisterns or other constructions intended to be in contact with calcareous water should not be of zinc. Bad zinc or very thin sheets are liable to be destroyed by sea-air, and by the sulphuric acid in the atmosphere where much coal is burned. Portland and Roman cement do not injure good zinc. Zinc sheets should not be allowed to be in contact with iron, copper or lead; in either case voltaic action will set up. This occurs especially and more rapidly when moisture is present, and for this same reason zinc paint should not be used on ironwork. Where it is absolutely necessary to place iron in contact with zinc, then galvanised iron should be employed. If iron nails are used for boarding under zinc, they should have their heads well punched into the wood and be covered over with a stopping of oil, cement or putty.

The expansion and contraction of zinc are greater than those of any other metal. It is perhaps unnecessary to state that of course the thicker the metal the less its expansion and contraction will be. Zinc is acted upon by moist air and a film of oxide is formed, which, however, as also in the case of lead, protects the metal from further decay. The oxide does not scale off as iron, but forms a permanent coating upon the metal. Zinc is said to be oxidised to the extent of 130 grains per square foot in twenty-seven years, and nearly half of the oxide thus formed is removed by the moisture of the atmosphere. As with nearly all other materials, the ultimate destruction of zinc is almost inevitable, as the coating of oxide cannot completely protect the subjacent metal from further oxidation. The first coat of oxide is insoluble, but if the sheet be too thin the oxide penetrates, and the metal goes into minute holes upon being walked over. Impure zinc, as in the case of chimney cowl, is apt to be injured by the fumes from wood fires. It should not be laid on any wood boarding (such as oak) containing acid, which tends to hasten its decay, and fir boards should be dry and laid about half an inch apart. The "Dictionary of Architecture" says that when zinc is placed against bricks containing even 1·14 per cent. of soluble salts it is destroyed. This difficulty, or the fear of it, can, however, be easily overcome in the few places where such contact may be necessary by placing felt or a similar material between them. The following reference to soot is an extract from vol. 27 of the "Proceedings of the Institute of Civil Engineers of England":—"Soot is destructive to zinc, forming with it a galvanic couple, which is brought into action by moisture and acid in the air."

There is said to be no practical engineer's test for the quality of zinc. Good sheet-zinc is of an even colour without black spots, tough, and easily bent backwards and forwards without cracking. Inferior zinc is of a darker colour than the pure metal, and of a blotchy appearance, caused by the presence of other metals which set up a galvanic action and soon destroy the zinc. Pure sheet-zinc is very durable if well laid, and if used of sufficient thickness, and from its lightness and strength is a valuable, permanent and economical material for covering roofs. By referring to Hurst's list of comparative weights of various metals of similar thickness and areas, it will be seen that zinc is lighter than either wrought-iron, steel, copper, brass or lead. From a circular issued by my father about ten years ago, I find it is stated that, as an average, 100 feet super of pantiling weighs about $7\frac{1}{2}$ cwt., plain tiling $14\frac{1}{2}$ cwt., slating $6\frac{1}{2}$ to 9 cwt., lead 7 cwt., galvanised iron $2\frac{1}{2}$ cwt., and 18-oz. zinc $1\frac{1}{4}$ cwt. I find upon calculation, and comparing these weights with other publications and lists, that they seem to be approximately correct. Of course, it is unnecessary for me to mention to architects that the lighter the roof covering the lighter also is the roof construction required under the same. Zinc is affected by change of temperature even more than lead; there is therefore the greatest necessity for leaving it quite free to expand and contract. The joints should on no account be soldered, otherwise tearing asunder will be the inevitable result; and for similar reasons nails should not pass through the surface of the sheets or roll caps, there being various modes of securing them from beneath. In the table of expansion of metals of similar areas, &c., in Laxton's "Price Book," I find that for 100 feet in length, by an increase of 100 deg. Fahr. of heat, cast-iron expands $\frac{3}{4}$ of an inch, brass $\frac{5}{16}$ ths of an inch, copper $1\frac{1}{4}$ of an inch, lead $1\frac{9}{10}$ ths of an inch, sheet zinc $2\frac{1}{10}$ ths of an inch. In "Notes on Building Construction" it is stated that zinc laid on flats or roofs to which cats can gain access is soon corroded. It is also stated (as an extract from Bloxam) that an objection to zinc is that it catches fire at a red heat and blazes furiously. Gwilt's "Encyclopædia" also states that when it is heated red-hot with access of air it takes fire and burns with a beautiful greenish or bluish flame. So far as I can learn from other works, however, there does not seem to be sufficient authority for the statement that the urine of cats is destructive to good zinc.

Liquid ammonia oxidises and then dissolves zinc, if severely tested. I also find that it is stated in other works that

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the best zinc on y gnites on a blazing fire, and never when the flame merely passes over it, and that it is therefore most useful for roofs, especially when the sheets are folded over, and thus exclude draughts; it is, however, undoubtedly acknowledged that it resists the action of flames at 700 deg. Fahr., and that lead does so at 500 deg. I may state that I have tested samples of Vielle Montagne zinc in an ordinary household fire, and have failed to ignite it. Roofs of zinc at Liège have been found to be still perfect after thirty and fifty-five years' existence respectively. St. Philip's Church, Dalston, is one of the early damaging examples of zinc roofing sometimes read about. This was built near the middle of this century, and at the time of the introduction of the metal into this country, and this roof had to be re-covered after seventeen years. I myself have no doubt that a thin gauge of inferior zinc was used and badly laid. My father more than thirty years ago covered a summer-house in his garden at Queen Square with, I believe, a not very thick gauge of corrugated zinc, and this roof is still in good condition. I have also seen numerous satisfactory examples of zinc roofing on the Continent, and there can be no doubt that the statement in Gwilt's "Encyclopædia" is correct. It is as follows:—"Good zinc, properly laid, has been proved by long (sixty years) experience in France, Belgium, Germany and Italy to be a secure, durable and economical covering; no detrimental effects from any particular climate are to be feared so long as care be taken to adopt the proper mode of laying, and to select the proper gauges of the best quality of zinc."

May I now mention that every sheet of Vielle Montagne zinc is stamped with their trade-mark, and that for roofing purposes the usual sizes of sheets are 6 feet by 3 feet 7 inches, 7 feet by 2 feet 8 inches, 7 feet by 3 feet, or 8 feet by 3 feet. Extra lengths up to 10 feet or 12 feet are, I believe, as a rule of extra cost. The Vielle Montagne Company, however, state that they make sheets up to 10 feet long without extra cost per foot superficial for the sheets of the gauges suitable, and recommended for roofing purposes (viz. Nos. 13 to 18 inclusive). It will be noticed that the words "roofing zinc" are stamped above the Vielle Montagne trade-mark. The number in the centre of this trade-mark refers to the gauge. The letter under the number varies, being the initial of the works where the sheets are rolled. The three figures under the trade-mark refer to the weight of the metal per foot superficial, in pounds, ounces and drachms. The thickness of zinc is indicated by a special gauge, which varies somewhat with different manufacturers. The old Belgian zinc gauge is as follows:—No. 8 approximate

B.W. gauge 26, and the weight 9 ounces per square foot; the numbers of the gauges rise one by one up to No. 16. The approximate B.W. gauge of this number is 18, and the weight per square foot is 26 ounces. The Vielle Montagne Zinc Mining Company have adopted a new gauge for zinc numbered 1 to 26, ranging from 0.004 to 0.105th of an inch. I may now perhaps mention the approximate weight and price per square foot of, say, four Vielle Montagne gauges of zinc. No. 13 weighs 17 ounces, and the average price is 6d.; No. 14, 18 $\frac{3}{4}$ ounces, 6 $\frac{1}{2}$ d.; No. 15, 21 $\frac{3}{4}$ ounces, 7d.; No. 16, 24 $\frac{3}{4}$ ounces, 7 $\frac{1}{2}$ d. per square foot. Very slight variations sometimes occur in the weight of sheets of the same nominal gauge. The thinnest gauge recommended for roofs is No. 13 Belgian gauge. No. 15 is better. Where used for gutters No. 16 gauge should be adopted.

The usual various Vielle Montagne gauges of thickness are from .026 to .070 of an inch; the thinnest of these are used for lining packing-cases and the next thicknesses for perforated articles, frets, &c. Messrs. Braby recommend 15 or 16, but No. 14 Vielle Montagne gauge is considered to be ample in London for roofing purposes if laid on boards; for roofs without boards and for gutters nothing thinner than 15 or 16 should be used. Nos. 17 and 18 are most suitable for gutters. For flats nothing lighter than 16 ought to be used.

I will now select and give the following information as to two Vielle Montagne gauges, viz. Nos. 13 and 16; the former is .029 and the latter .043 of an inch thick. The approximate B.W. gauge of the former is 22, latter 19; weight per square foot—former almost 17 oz., latter 24 $\frac{3}{4}$; the weight per sheet, 8 feet by 3 feet, former 25 lbs. 7 oz., latter 37 lbs. 2 oz.

(To be continued.)

THE engineer to the scheme for the construction of a bridge and railway across the English Channel has prepared the details of the expenditure proposed to be incurred under the Bill now before Parliament. The estimates show that the proposed works will cost 98,900l. They would be carried out merely for the purpose of demonstrating "the practicability of constructing and maintaining the Channel Bridge." In the event of the experimental works proving successful, it is proposed by the Bill to authorise the Lords of the Treasury to sanction the prosecution of the permanent works.

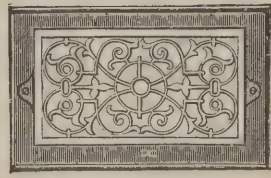
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NATIONAL BUILDING TRADES EXHIBITION.

IN our introductory paragraph last week it was stated, in accordance with the printed programme, that the orchestral arrangements were under the direction of Mr. Glenn Wesley. We are informed that this is a mistake, and that Mr. Wesley is Miss Eleanor Clausen's agent in connection with the orchestra of young ladies she has trained, and which is known as the Pompadour Band. The Consultative Council on Wednesday afternoon paid a visit to the various exhibits in the Hall.

Vitreous Enamelled Glass and Tile Company.

The Vitreous Enamelled Glass and Tile Company, 38 Lime Street, E.C., show a splendid exhibit of their patent translucent enamelled glass and tiles in relief. A few samples would amply suffice to show the beauty of the materials, but the exhibit is characterised by an almost exhaustive display of the capabilities of these specialties in variety of designs for ornamental effect. No subject comes amiss for design or execution; pictorial, floral, jewel-like effects, and every kind of ornamental effect can be designed and executed, judging from the beautiful specimens exhibited. Although we have on more than one occasion described these specialties to our readers, it may be of interest to give a general description. Translucent enamelling in relief on glass and tiles is a means of decoration not only permanent in itself, but also in colouration, which cannot fade. Being vitreous and fired at a high temperature, it fluxes itself to the surface of the glass when soft from heat, and cannot be removed though it will take a diamond cut. On white glass an effect is gained both by reflected and refracted light by day and also by reflected light at night, giving a maximum of light combined with a delicacy of effect. It answers admirably for windows, door panels, fanlights, window blinds, inside sky-

lights, screens, ship saloon lights, lettered panels, lamp panes, finger-plates, fire screens. On tinted glass as a background, the ornamentation in enamel and gold, which is also fired in, and where required it can be silvered on the back, a very rich effect is gained, rendering it suitable for ceilings, mural decorations, friezes, panels, pilasters, fascias, &c. For Oriental and Eastern designs it is particularly adapted. On tiles the effect is quite a novelty, and almost any design can be produced. Artists and architects wishing to have their own ideas executed will find this a means of doing so economically. It can be fired in panels up to 80 inches by 45 inches, if required. For the purposes of windows, panels in doors, &c., the enamelled glass is shown transparent or semi-opaque, preventing anyone looking in from the outside in the latter case, or in the former case to afford a view from inside or outside. The enamelled design takes effect from the inside and outside by night as well as by day. For wall-panel decorations and ceiling decorations it is eminently fitted, and the decorations on silver and other glass have a peculiar charm owing to its sparkling brightness. For fascias and work of the like kind it is exceedingly well suited. The selection that the company have made for exhibition has evidently been most carefully and judiciously chosen to show what can be done in this class of work.

Yates, Haywood & Co.

The stand of Messrs. Yates, Haywood & Co., and the Rotherham Foundry Company, Limited, 95 Upper Thames Street, E.C., contains a large collection of their high-class specialties. One of the special exhibits is the patent "Quadrant" kitchener, with lifting fire and open or close arrangement. The fire is self-adjusting, raised or lowered to any point by one hand, without any rackwork, for it works on the quadrant which is at back. Economy of fuel and convenience for cooking operations are combined in this kitchener, which is of heavy metal well finished. There are several varieties of the "Quadrant" kitchener to meet special requirements. No. 300C is, for instance, a double-oven kitchen range, strong and well fitted with continuous plate shelf, high oven in strong cast-iron, low oven in wrought-iron, strongly protected by cast-iron saddles, ovens ventilated by steam outlet pipes, bright banjo latch and hinges, bright bracket tables under ovens, wrought fall bar, with draw-out fret and rack, swing smoke plate, with coves, ashes pan and cinder sifter, castings rubbed, hot plate ground and blacked, and fitted of course with the patent self-adjusting quadrant

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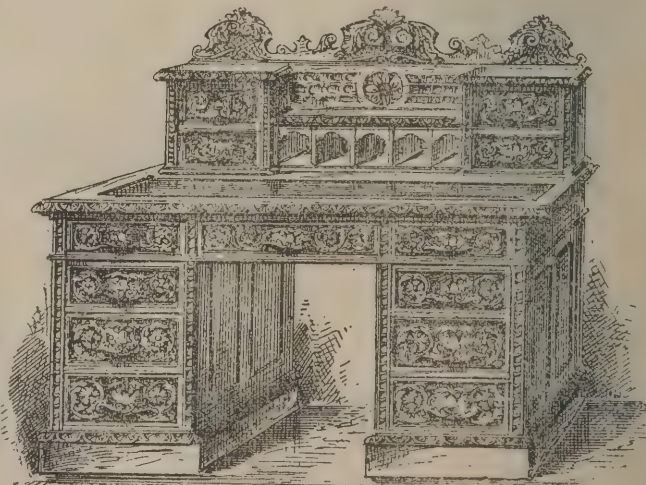
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lifting fire. Among the high-class goods is a dark oak carved mantel and overmantel with bevelled-edged plate glass mirror. The fire-grate is handsome, enclosed by panels of hand-painted tiles and marble slips. In another case, beautiful lustre tiles are used for the panels, the mantel being of pine painted a glossy white, the overmantel forming a kind of gallery constructed with arches, columns, &c. No. 309 is panelled with handsome vitreous tiles, No. 23 is polished mahogany with hand-painted tile panels. There are also handsome marble chimney-pieces, Lavanda, Brocatella, statuary inlaid with Sienna, &c. The hospital hot-air stove, a tiled stove, as its name indicates, is used for hospitals, infirmary wards, &c. The Pinkerton grate is a novelty. Instead of a semi-elliptic or semicircular shape the grate is entirely circular, not displeasing in appearance. Stable fittings are also shown. We shall notice these exhibits again next week, including the Guinness range, &c.

J. Jonas.

The stand of Mr. John Jonas, of 38 Lime Street, E.C., is a very interesting one. Among the exhibits is the new improved automatic oil lamp (Ross's patent), which gives a light of 100 candle-power at the cost of one farthing per hour. The lamp itself is inexpensive, but the cost would no doubt depend on the degree of ornament designed. There can, from the form of construction, be no shadow under the lamp. That it is economical and also easy to manage there can be no doubt, and also smokeless and odourless. It seems altogether a very perfect lamp in all respects, and unique in small consumption of mineral oil. Many in these days prefer lighting by oil or by electricity to gas-lighting. Electricity is at present somewhat expensive. Gas fittings in the way of sun-lighting necessarily must be expensive, and ordinary gas-lighting of rooms is considered by many detestable, from absence of proper illumination, from its vitiating the air in the room and spoiling everything in the room. The sunlight oil lamp will come as a boon to many. There is no wick-trimming required, as the three wicks used merely act as feeders to a cotton ring and require renewing once in twelve months. The cotton ring which furnishes the flame has merely to be removed once a week and replaced by a fresh one. Several stands are lighted with the automatic oil sunlight lamp, viz. Messrs. Minton & Co., Messrs. Macdowell Stevens & Co., Fireproof Construction Co., &c. Another exhibit is the "Lucal" light, also the Comet light, as approved by the County Council for

lighting large open spaces. It is calculated that a light of 12,000 candle-power is produced at a cost of 3d. per hour, or a power of 4,000 candle-power can be used. The light being portable is another advantage. It is always ready for use and will burn any oil. The "Acme" vapourising and hot-air circulating stove is also shown. The stoves are arranged for an open gas fire, and means are taken to moisten the hot air by evaporation of water. The patent "automatic" oil economiser is a useful tank which is now used instead of casks and cisterns, provided with taps. Among other merits it combines safety with economy.

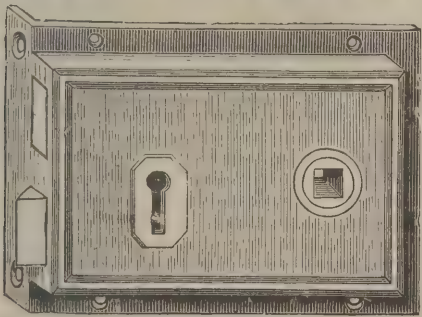
Harry South.

Mr. Harry South, electric-light engineer, contractor and manufacturer, art metal worker, &c., 10 and 12 Garrick Street, Covent Garden, makes a beautiful show of his artistic electric fittings at the stand of the Coalbrookdale Company, besides lighting various other stands. The dynamo is one of Crompton's, driven by Messrs. Tangyes, Limited, with a 7 horse-power nominal Tangyes' gas-engine. The lighting arrangements carried out by Mr. Harry South are well worth a visit, as every variety of fittings and glass shades, &c., are to be seen, as suited for drawing-rooms, dining-rooms, halls and staircases of mansions, &c., in the way of standards, pendants, brackets, electroliers with five or more lights, and handsome ceiling fittings. Single lights, grouped lights, &c., take all kinds of ornamental forms in brass and copperwork, the metals singly or in combination, of cast, hammered and embossed work, many showing very pretty adaptations of foliage design, rosettes and the like. A most pleasing feature of the exhibit will also be found in the "candle" fittings, so called from resembling a chandelier lighted by candles. In addition to all the before-mentioned, more ordinary fittings are seen, but carried out in such tasteful design that the difference is scarcely secondary to the higher class articles.

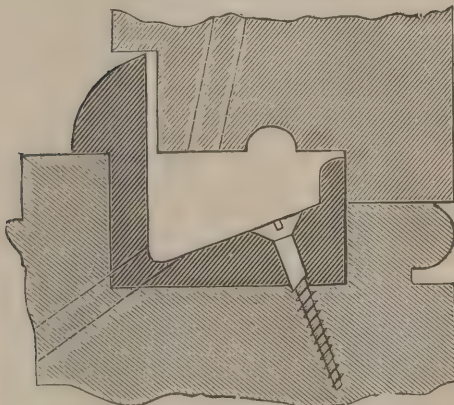
W. Garstin & Sons.

Last week we gave a notice of the British, foreign and general granites and marbles shown in excellent varieties for all architectural, building, engineering, decorative and constructional purposes at Stand 7, by Messrs. W. Garstin & Sons, of 760 Harrow Road, London, W., and the King Street Granite Works, Aberdeen. Among the specialties are their Bavarian and Italian granites. But at the present moment we wish to call attention to a very excellent novelty just brought out, in the shape of a non-slippery granite step. The special

HILL'S PATENT LOCKS & OTHER FITTINGS.

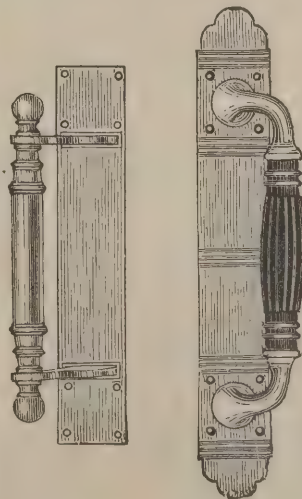


Reversible Four Ways.

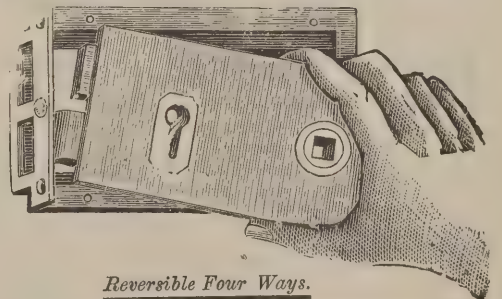


HILL'S NEW REGISTERED
WATER BAR
FOR CASEMENTS OPENING INWARDS.

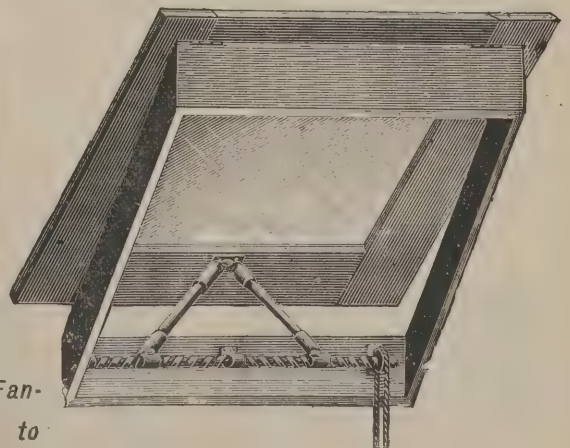
All kinds of Rim and Mortise
Locks, Door Furniture, Sash and
Casement Fittings, Swing-Door
Hinges, &c., kept in Stock.



Hill's Patent Gearing for Fan-
lights, Skylights, &c., made to
suit lights hung every way, and
worked with cord or rod.



Reversible Four Ways.



HILL'S PATENT
SKYLIGHT OPENER.

Prices and Particulars on Application.

JAMES HILL & CO., 100^A Queen Victoria Street, London, E.C.

feature of the patent (Hornham's) is a simple combination of lead with granite. This is effected by two rows of holes jumped or bored in the front or wearing surface of the tread. The holes are about $\frac{3}{4}$ of an inch deep, and filled with lead cut flush with the surface of the granite. The lead and granite wear equally, nothing getting out of line or position, as in the case of lead nailed on wooden treads. The sample shown has been subjected to several tests, and the patent should meet with success, as it obviates the periodical axing of the ordinary granite steps. At any rate, it is well worthy of a trial, and the patentee, Mr. Hornham, is quite willing to afford architects, surveyors, &c., the opportunity of testing it.

J. C. Broadbent & Co., Limited.

Messrs. J. C. Broadbent & Co., Lim., 73 Basinghall Street, London, E.C., of Huddersfield and Hazlehead, near Sheffield, manufacturers of silicate cotton or slag wool, show a model of a building to demonstrate the various methods and uses of the silicate cotton or slag wool in its application to buildings. This material is a mineral fibre made from blast furnace slag. In the model the application of slag wool for floors, partitions, roofs, pipes, cisterns, baths, &c., is shown.

Joseph Williamson & Co.

Messrs. Joseph Williamson & Co., Midland Foundry, Wellingborough, Northamptonshire, show five of their new patent "Graphic" kitcheners (with rising bottoms), ranging in size from 3 feet to 5 feet. The fire can be regulated from a depth of 12 inches to 6 inches. The lifting of the fire is simplicity itself, effected by the mere turning of a handle, without levering up or anything of that kind. In each case, owing to the slope, at any stage the fire is always well to the front for roasting, toasting, warming up, &c.; another advantage in addition is economy as to fuel. Another feature to be seen applied to these stoves is a rising table, which rises exactly with the lifting of the fire, useful for warming up and other cooking purposes, roasting, &c., for heating plates, also irons for ironing linen, &c. The fire has thus three stages—low, medium and high. The stoves have the usual requirements as to ovens, plate racks, boilers, &c. The boiler, though more expeditious than the usual run of boilers, is smaller, and so there is a saving of space. The stoves are well finished off with tilework and bright metal fittings, tables to ovens, which are easily let down and fall flush with the front when not required for use. The "Graphic" stove, No. 513, when lighted in the hall showed an average oven temperature of 210 deg.

Fahr. all the afternoon and evening. The stoves are made of strong and heavy metal, and any portion, if required, can be replaced or repaired with ease, as all the parts can be taken to pieces by any one.

Linoleum Tile Company, Limited.

The Linoleum Tile Company, Limited, 26 Shaftesbury Avenue, London, W., show their noiseless and inefaceable inlaid linoleum tiles for forming solid inlaid floor coverings which can be laid on wood, stone or cement with as good an effect as encaustic tiles, without being so expensive. These tiles are especially adapted for use in churches, hospitals, clubs, hotels and large public buildings, as well as for entrance-halls, offices, libraries, ships, smoking-rooms. They are noiseless and pleasant to walk on, waterproof and warm to the feet, not slippery, and will neither buckle nor blister. The colours and pattern retain their brightness after years of wear, as they are solid, go right through to the backing, and consequently do not fade until the material itself is actually worn away. Any pattern can be renewed at a few days' notice, whereas the ordinary designs in linoleum, &c., can seldom be matched after once being laid down. When any special part becomes worn or accidentally damaged, it can immediately be replaced without disturbing the remainder of the floor-covering, thus effecting a great saving in renewals. Waste of material in fitting awkward corners, &c., is entirely obviated, as the linoleum tile is cut in sections varying in sizes, and the purchaser only pays for the actual amount of material employed. Any variety of colours can be had in heraldic, æsthetic, grotesque or other designs, and any pattern, crest or monogram can be made. Different patterns are shown as executed in the waiting-rooms of the refreshment bars at Liverpool Street, for the Great Eastern Railway; also for the Great Northern Railway, and for corridors and lavatories for the London School Board, these last being fixed on stone. The linoleum tile floor covering is to be found used all over London and the provinces. Among a few of the noteworthy buildings are Windsor Castle, Bank of England and Bank of England branch at Newcastle-on-Tyne; Royal Horse Guards Cavalry Barracks, Windsor, &c.

A. G. Bell.

Mr. A. G. Bell, of Sherwood Street, Nottingham (Messrs. Alfred Appleby & Co., London agents, 85 Gracechurch Street, E.C.), exhibits Bell's patent fire-resisting doors and frames. These doors are made of wood with an interior lining of

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IN CARTON PIERRE AND FIBROUS PLASTER.

CABINET & JOINERY WORK.

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Factories:—PROVIDENCE COURT and PORTMAN MEWS SOUTH.

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W. DUFFY'S PATENT

IMMOVABLE ACME

WOOD BLOCK FLOORING.

THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain

Full Particulars and Prices on application to

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asbestos. Doors also are exhibited that were subjected to fire, and after twenty-five minutes, although the woodwork was burnt on one side, the packing effectually prevented the fire passing through the door. The doors are non-conductors of heat; they are designed in any style to harmonise with the other doors and general fittings of the building; they are not awkward to open like iron doors, for as they are not much heavier than ordinary wood doors they open easily and are noiseless in work; by using either a door spring or rising butt hinges they can be made to close automatically—a most important desideratum in a fire-resisting door; they can be used in many positions where iron doors could not be placed, such as between the wards in asylums and hospitals, between various departments in warehouses, at the end of corridors, in hotels, mansions or public halls; they will be found most valuable in connection with hoists—by using these doors as trap-doors to each storey, they completely cut off one floor from another and thus hinder the hoist acting as a huge chimney; they are very moderate in cost.

Leeds Steel Works, Limited.

The exhibits of the Leeds Steel Works, Limited, Leeds, makers of basic Bessemer steel girders, channels, tram rails, rounds, angles, flats, billets, blooms and slabs, are shown by Messrs. H. J. Skelton & Co., 12 Lime Street, London, E.C., being various sections of rolled steel joists, girders, &c., constructional work, &c. All information as to the varieties, sizes, load carriage, &c., will be found by consulting the illustrated sheets and catalogues. The company make a specialty of iron and steel of difficult shapes and sizes; unusual sections to all tests and specified chemical analyses; large stocks for quick deliveries. Pig-iron, cold blast and hot blast. Wrought-iron in bars, plates, sheets, hoops, strips, angles, tees, channels, rods, wire, wire rods, forgings and sections. Mild steel in ingots, blooms, billets, slabs; tin-plate bars, wire rods, wire, rails, bars, plates, sheets, hoops, strips, angles, tees, zeds, channels, rolled steel girders or joists, forgings, and all sections. Castings in iron or steel from $\frac{1}{2}$ lb. to 40 tons weight each. Galvanised iron or steel in plates of 1 inch thick down to sheets of 30 B G plain or corrugated. Rails and fastenings for railways, tramways, mines, &c., in iron or steel. Rivets, bolts and nuts, spikes, coach screws, set screws, nails. Engines—blowing, exhausting, pumping, winding, hauling, air-compressing, tank loco's, rolling mill engines, foundry and iron and steel works plant. Steam hammers, hydraulic machinery, Roots' blowers,

foundry plant, cupolas, &c. Flanged, pressed and dished plates; corrugated flues; boilers; iron and steel roofs and girders.

Cameo Woodworking Company, Limited.

The Cameo Woodworking Company, Limited, 11 Billiter Square, London, E.C., exhibit their decorations as manufactured in England from natural solid wood. These decorations are reproductions by machinery of hand-carved mouldings, panels, borders, friezes, inlays, marqueterie, &c., of high artistic effect and finish, cheap in price. The Cameo woodwork is especially suitable for the building, cabinet maker's, railway carriage and shipbuilder's trades, and in general for all purposes where high-class effects are to be obtained at a moderate outlay. The decorations are durable, and can be applied without fear of clashing by the side of expensive hand-carvings. They are manufactured in quantities in all ordinary woods of commerce and in suitable lengths. For borders, friezes and mouldings it should be noted that all patterns are continuous, unlike tiles, without any break in the pattern, and they can be made in almost any thickness of solid wood. Higher artistic effects, at a comparatively low price, can be obtained by the application of the Cameo woodwork than is now procurable by use of other decorations. The Cameo woodwork is waterproof and may be cleaned like ordinary hand-carved wood. Very elegant effects at a small outlay are obtainable by using the Cameo woodwork for dados, ceilings, &c. Design and pattern cause no difficulty in this process, and thus it differs entirely from those processes which are confined to the production of geometrical designs only.

Paragon Bolt Syndicate, Limited.

The Paragon Bolt Syndicate, Limited, 14 Sherborne Lane, London, E.C., show an excellent and most easily worked tubular bolt for doors, windows, &c. The use of bolts on room doors is very old. In many cases they are used as an extra protection in addition to locks, and placed outside the doors of the various rooms in houses, to render it more difficult for burglars getting further into the house than the actual room they have entered. A certain amount of unsightliness has to be put up with, but by use of the "Paragon" bolt instead of ordinary bolts the unsightliness is done away with, as the "Paragon" is ornamental rather than otherwise. Other advantages of the "Paragon" as compared with ordinary bolts are:—Great strength—it is not dependent for security on a few small screws in the socket; exceeding neatness, no beading to be cut away for

THE INCANDESCENT GAS LIGHT

(WELSBACH SYSTEM).

One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of $3\frac{1}{2}$ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

ARGAND " 44 " " " " "

SIEMENS' BURNERS, 23 calories per candle per hour.

WELSBACH " 10 " " " " "

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

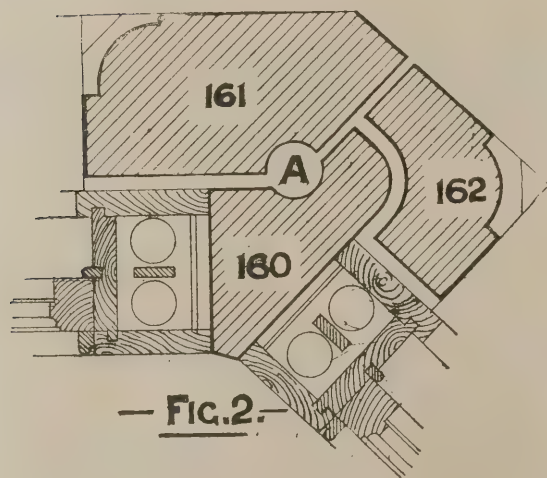
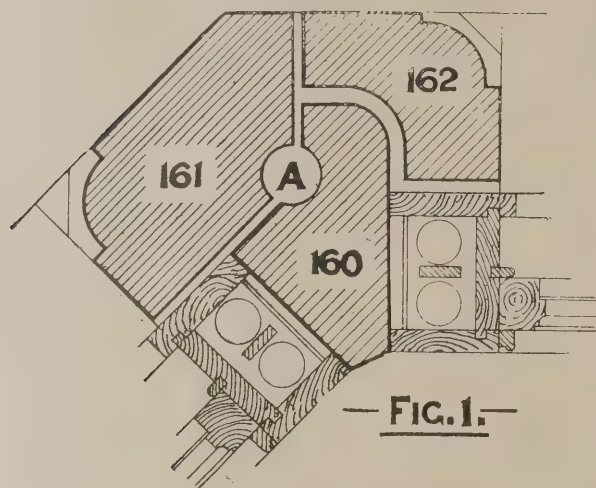
FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS LIGHT CO., LIM.,
14 Palmer Street, Westminster, London.

socket; shoots smoothly and requires no force; dropping of door does not affect working of bolt; has no springs, and is practically everlasting; upper bolt on door can be fixed within easy reach, not of necessity at the top of door, as with other bolts.

E. P. Bastin.

The exhibits of the Rowlands Castle Brick, Tile and Terra-Cotta Works, Rowlands Castle, Hants, at Stand No. 84 comprise a small erection in this firm's well-known dark and rich red facing bricks (very similar to the noted Fareham reds), with ornamental bricks, panels, pateræ, ridge tiles, finials, &c. The plain and ornamental bricks are sand-faced, and are all hand moulded. They are made from plastic clay of very good quality; the deep red colour is obtained by careful preparation of the clay and thorough burning of the manufactured goods. No colouring matter is used. These bricks have been proved by Messrs. Kirkaldy to stand a pressure of over 300 tons per square foot before crushing, and have been used for facing many important buildings. The two projecting piers are built of Holloway & Bastin's patent tiebricks for bay windows, &c. These patent tiebricks will be found well worth examination, and it is claimed have many advantages.



The above sketch of the patent tiebricks for piers of bay windows, &c. (Holloway & Bastin's patent), shows the construction of two piers of a bay window. It will be seen that the arrangement is very simple and effective, a stronger pier being built in less space than where ordinary bricks are used. The tiebricks are made reversible and handed, so as to insure a good bond at every course, and, if built in cement, will form as strong a pier as one of solid stonework of the same section. The strength of the pier may be further increased by building iron bars in the recesses marked A. There is no cutting and waste of materials for forming the piers, and consequently there is a saving of time and expense. Perfect shape is insured, with faces and angles true; each brick repeats itself in each course with accuracy. In the construction of piers in the ordinary way, rubbish or shapeless bats are sometimes worked in, which instead of giving strength are actually dependent on the cement or mortar used to keep them in position. Architects, by specifying that Holloway & Bastin's patent tiebricks shall be used, will insure that the piers in the building are equally solid throughout.

Ashwell & Nesbit.

Messrs. Ashwell & Nesbit, of Leicester, and 14 John Street, Adelphi, London, show an installation of their patent "Leicester

Plenum" system of warming and ventilating buildings, comprising wet and dry filter, fan driven by electric motor, Ashwell & Nesbit's battery of heating surface, flues, gratings, &c., connected with a room constructed and fitted up most tastefully as a sitting-room. Space unfortunately will not be sufficient to describe the merits of the system. The testimonials received from the Leicester School Board and the medical superintendent of the Nottingham Borough Asylum prove these merits. One feature is the ease with which an equable temperature can be kept up throughout. Another thing is the arrangement for preventing the air, as it would at times, getting too dry. There is also a good filter which effectually eliminates from the air all impurities, dirt, dust, smuts, &c. A variety of very efficient radiators, having a large surface in a small compass, are shown. The "Solar" radiator, equally applicable for steam and hot water; the "Solar Ventilating" radiator, equally applicable for steam and hot water. This radiator is free from the faults common to most ventilating radiators. The passages for the ingress of the fresh air are large and smooth, and will not thus harbour dust; they are straight, and can therefore be readily cleaned; the valve for shutting on and off the fresh air is cheap, simple and efficient. The radiator can be made up in any number of loops, from two upwards. Wrought-iron weather-tight casements of the firm's own sections and manufacture. A ventilating open fire grate for warming incoming fresh air. A ventilating open fire hospital grate with descending smoke flue. The "Meldrum" patent forced draught apparatus as shown on a Cornish boiler (Meldrum Bros, 16 Union Court, E.C.), in which the steam passes altogether under the fire; and the electric motor for driving fan and electric-light installation (Edmundsons, Limited, Great George Street, Westminster).

C. G. Roberts.

The excellent patent of Mr. C. G. Roberts, Haslemere, Surrey, for utilising rain-water is shown. There is the vertical rain-water separator and the horizontal rain-water separator. The appliance we have before now described and fully explained. It has nothing to do with filtering water. Its function is simply to convey pure rain-water from the roof as it falls to a tank or proper receptacle. There is nothing particularly complicated in the construction, but it is so arranged only pure water is collected, the washings of the roof having first run away to waste. The vertical separator is used where a single stack pipe carries the water from the roof to the tank. One length of the stack pipe is removed, and the separator is inserted and fastened to the side of the house. When a building is provided with several stack pipes connected by an underground pipe leading to the tank, a different form of separator is used, the "horizontal separator." The rain that falls upon the roofs of most dwelling-houses is sufficient in quantity to furnish all the water that is needed for household purposes; the area of the roofing in most farm buildings is also amply sufficient for collecting all the water required for horses, cattle, dairy and engine. The inferior quality only of the water has hitherto prevented its more general use. Provision is made in most country houses and in many town houses for storing rain-water from the roof, but many who have sought to avail themselves of this cheap and constant supply have been disappointed at finding water so collected seldom fit for use. The rain that first falls upon a roof brings down from it all the soot, bird-droppings and other impurities that have been accumulating since the last shower. Under ordinary circumstances, these are all carried into the storage tank. The insoluble portion of these impurities settles at the bottom, only to be stirred up again by every fresh fall of rain. Such water, at its best, holds in solution deleterious substances not removable by ordinary filtration. The rain-water separator can be fixed up by any ordinary workman. It is self-acting, and after rain has been falling for a certain time, the separator cants and turns the pure water into the storage tank.

Fireproof Construction Company.

The Fireproof Construction Company, 11 Victoria Street, Westminster, exhibit the "Hygienic" fireproof block partition, which forms a perfectly rigid wall only 3 inches thick when plastered over on both sides. A wall so formed is fire-resisting and sound-preventing, also germ-proof, vermin-proof and damp-proof, and is self-supporting. In addition it is lighter than brickwork, being 500 per cent. lighter than a $4\frac{1}{2}$ brick wall. It can easily be erected by anyone. The ordinary lath-and-plaster construction of late years has been discarded in favour of better systems, owing to lack of solidity, non-resistance to fire, and many disadvantages in bringing about insanitary conditions. Hygienic block partition walls remedy all these evils. These improved partitions are built up of blocks or slabs preferably of about 6 feet 6 inches in length by 10 inches deep and 2 inches thick, and composed of a light fire-resisting material. Through the blocks or slabs are a series of longitudinal tubes, the said tubes forming continuous passages through the blocks or slabs when the latter are placed in position contiguous to one another. These tubes have the effect of deadening sounds between rooms provided with the said partitions, and they also

give lightness as well as rigidity to the blocks or slabs. The blocks are of such consistency that they can be cut with the greatest ease to any length that may be required with an ordinary saw. Where very great strength is needed, such requirements are provided for, but a slight additional weight is then included, which, however, is of little consequence, the cost in all cases being trivial compared to the cost of other systems. The finish of the walls with the Hygienic wall-plaster or fire-resisting cement results in perfect smoothness equal to that of marble-work. The blocks afford a fine key for plaster-work, as perfect as could be desired for any kind of plaster-coating. Some of the advantages possessed by this system have been already mentioned—strength combined with lightness of structure, sanitary properties, sound and fire-resisting capabilities, &c. It has been much used in theatres. In addition the partition is self-supporting, and enjoys immunity from any danger of cracking, there being no woodwork to shrink or expand through influence of weather. It is not only cheap in actual cost, but economical in saving of time. The Hygienic fireproof cement is a plastering material free from all efflorescence or salting, drying in a few hours and ready for painting, &c. It is an excellent cure for damp walls. An application of this system should be mentioned, viz. that it is peculiarly well suited for walls which it is desirable or necessary to fix tilework on, as it forms a splendid key. The material also lends itself admirably, without the need of fixing blocks for driving nails on which to hang pictures, &c.

H. J. & C. Major, Limited.

Messrs. H. J. & C. Major, Limited, of the Patent Tile Works, Bridgwater, Somersetshire, are well known for the excellent roofing tiles manufactured by them, and which have been awarded medals at exhibitions. A pretty little structure erected in the hall shows off to advantage various weatherproof roofing tiles, and among them Major's patent weatherproof double Roman-pattern roofing tiles (75 tiles to a square), and Major's patent weatherproof angular corrugated roofing tiles (87 tiles to a square), also Major's patent interlocking plain tiles of the Broseley type (450 tiles per square). The patent tiles above mentioned do not require nailing to keep them in place, nor pointing, "touching," or "bedding" to make a perfect roof. Various specimens of ordinary tiles, roofing, paving, malt-kiln oven, &c., are also shown, and bricks and brickyard goods generally.

Samuel Elliott.

Mr. Samuel Elliott, of Newbury, Berks, has a very fine exhibit of mouldings in all kinds of hard and soft woods, for dados, architraves, panelling, skirting, cornices, &c., dentil work and electric-wire casings, church seat ends and mouldings of every variety, plaque rails, newels, balusters, chimney-pieces and other fittings, and cabinet-work. The patent perfect simplex weather bar of casements and doors opening inwards is also shown. This is rather a meagre description of what is shown by Mr. Samuel Elliott, for it certainly requires an actual visit to properly appreciate the work. There is shown much beautiful woodwork as it has been carried out for decoration of restaurants, hotels, and other buildings in our large English towns and cities, to the satisfaction of everyone, being handsome, appropriate, and altogether pleasing in its effect.

John Grundy.

We described last week the exhibit of Mr. John Grundy, of Duncan Terrace, N., and Tyldesley. Mr. John Grundy is also showing an improved sanitary air-tight frame and cover for drains, &c. It is claimed for this inspection cover, known as the "Gough," that it is the most perfect, simple and economical manhole cover offered to the public, no screws or similar device being required as with other covers; warranted not to get fixed in the frames. There is no doubt a simple contrivance like this, which is gas and air-tight and opens readily without anything being out of order, even if the cover had been unopened for years, is a very valuable appliance. We hear that everything exhibited by Mr. John Grundy at his stand has been sold, and that several orders for the warm-air and ventilating apparatus have been booked.

Mintons, Limited.

In our notice of this exhibit last week we promised to give further particulars in this week's issue of *The Architect*, which we now proceed to do. The tiles of Messrs. Mintons, Limited, of 28 Walbrook, E.C., form an attractive feature of the exhibition, and the new designs in the arrangements for walls are worthy of the artistic reputation of this well-known house. One cannot help being struck with the excellence of their manufacture. Their coloured glazes, with plain surface, are worthy of special notice, being entirely free from crazing. This defect, so general with tiles of this class, and which is very noticeable in lighter colours, they appear to have quite overcome. Their ornamental panels, with a view of an old cottage



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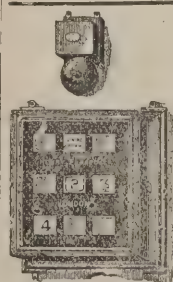
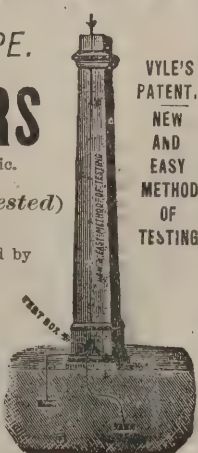
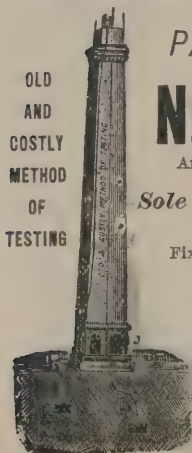
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surrounded by strips and mouldings, is very pleasing. We noticed, too, a charming pair of panels for stoves in coloured glazed; the subject, a view with windmill, produced by embossment and indentation. Fender kerbs, the front lengths in one piece up to 4—6, are to be seen, and are much to be preferred to those in 12-inch lengths, there being no ugly joints to regulate. Altogether it is a grand collection of tiles, giving some idea of the vast number of patterns made by Minton's of Walbrook.

The Silent Step and Flooring Company.

The Silent Step and Flooring Company, of Leadenhall House, 101 Leadenhall Street, E.C., show their patent step and floorings for covering steps and surfaces of all kinds, whether in or out of doors. The steps and flooring consist of a steel sheet, effectually galvanised or enamelled to prevent rust, made in any size or shape, and pierced with a number of diamond-shaped or square holes, into which studs or blocks of the most durable indiarubber are inserted, which give firm foothold and render slipping and noise impossible. The studs or blocks of rubber being dovetailed into the metal frames, they cannot come out. The Silent Step and Flooring Company are manufacturers of the patent loose rubber stud. The stud consists of a small iron plate with projecting nail points, around which indiarubber is moulded and vulcanised, making a solid combination of rubber and iron. All that is required to fix the studs to the surface for which they are intended is a simple blow of a hammer. The studs so fixed will afford a firm and safe foothold, and are quite noiseless, cleanly and durable, and are suitable for staircases, billiard-rooms, refreshment-bars, door-mats, hansom-cab mats, tramcars, railway carriages, warehouses, aisles of churches, corridors, clubs, public buildings, &c., and companion-ways on board ship.

Freeman Brothers.

Messrs. Freeman Brothers, 99 York Road, Battersea, have a good display of sanitary specialties, which embraces their patent adjustable pedestal wash-down w.c. "Turret." The basin and trap are in two pieces of glazed earthenware, forming a complete pedestal closet of handsome design, the advantages of the arrangement being that the outgo of the trap can be turned in any direction relatively to the inlet to basin, and the whole apparatus maintains the full merit of a deep water-seal, attractive appearance, perfect security of jointing and easy application. For handiness in the setting system possesses many points worthy of notice, being easy to adjust. The closets

shown are all fitted with the firm's patent lead connections, which insure a perfectly tight joint. They also show an improved method of connecting lead to iron pipe, for these cast-iron casings are made in suitable lengths to form part of the conduit, and are cast with a bevelled aperture at the side. The cases are lined with lead turned over at the bottom and trafted into the collar at the other end, making the branch portion the strongest part of the work

William Hepton & Son.

Messrs. William Hepton & Son, of Hunslet Lane, Leeds, exhibit their new registered corrugated copper cylinders, which they have constructed with a view to securing cheapness with efficiency. It is well known in the trade the system of loading copper cylinders only reduces the price per pound, and the cost of an ordinary cylinder is more than Messrs. W. H. & S.'s corrugated ones, as they are sold at so much each to stand a definite pressure, and by specifying you save money and secure a pure copper cylinder to stand pressure required. The corrugated cylinders are finished with bright polished tops, and are guaranteed to stand double the pressure of any ordinary one same strength, and are as cheap as galvanised iron.

A. C. W. Hobman & Co.

Messrs. A. C. W. Hobman, Cliftonville, South Bermondsey, show specimens of their special tar-paving. It is made of pure limestone of a special description of stone, only found in their own Maidstone quarries. Specimens are shown of this tar-paving which have been standing the wear and tear of traffic for years in London. Throughout the entire thickness of the paving the stone is incorporated in the tar composition, and forms a homogeneous concrete slab suitable for vehicular and foot traffic. It has a nice smooth surface, pleasing in effect, and is not slippery. It keeps free from dust and slush, is impervious to moisture and is a sanitary pavement. For the Clifton artificial stone, artistic character, durability, cheapness and adaptability are claimed, and there seems no reason to doubt of its merits in these respects. Laid in slabs or *in situ* it is well suited for street-paving, railway platforms (especially where traffic is heavy), stables, brewhouses, warehouse floors, laundries, lavatories, cow-sheds and dairies, also for making sinks, chimneypieces, dressings of all kinds, steps, cills, heads, piers and caps, coping, ridging, &c. For staircases, plain or mosaic, it has been specified by London and provincial architects by Board schools, public and charitable institutions, public and private buildings generally. Old and worn staircases can be

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levelled up and renovated with Clifton stone. It is non-slippery and worked with the same facility as natural stone. The Clifton mosaic stone is designed for decorative purposes, and made in various designs and colours, forming an excellent substitute for marble.

T. Potterton.

Mr. T. Potterton, 122 Cavendish Road, Balham, S.W., exhibits a remarkably good system for house warming which, though only a few months old, has attracted considerable attention, and is already much used. It is a system of warming buildings by utilising what would otherwise be wasted heat from kitchen fires. This is effected by an improved zigzag range-boiler. It can be fitted to any kitchen or range, and is so arranged that it has a maximum of heating surface which is heated by the waste heat. These boilers, which are very powerful, heat from 100 to 200 gallons of water per hour, and warm from 20,000 to 40,000 cubic feet of space, according to size of boiler, for they are, of course, made in various sizes to suit any existing range. One boiler fitted in a house and used during the winter for a 10-inch fire (42-inch kitchen) is now heating equal to 600 feet of 2-inch pipe in coils, warming seven rooms, a small greenhouse 10 feet by 9 feet by 6 feet, a small conservatory 8 feet by 10 feet by 4 feet 6 inches, a large window conservatory 16 feet by 4 feet by 2 feet, and gives an abundant supply of hot water for domestic purposes, the range being used for baking, roasting and boiling purposes. There is no other fire on these premises, and there were six before this system was installed! Anthracite coal can be used at night time, thus supplying the house all night with warmth, the anthracite burning ten hours without attention. Independently, a special boiler is made for heating greenhouses or other structures if so desired. Mr. Potterton also shows Milan's patent automatic fire-extinguisher for household boilers and heating apparatus, by the use of which disasters and loss of life caused by explosions of domestic boilers and heating apparatus is rendered absolutely impossible. The appliance is simple in construction and perfectly automatic in its action, there being no mechanism to get out of order, no valves to lift, or disc to break, nor springs to force, but simply a balance of pressure by a small quantity of mercury, and if the pressure is increased at all over the nominal water pressure on the boiler the appliance immediately acts, puts out the fire, relieves the pressure, and after the source of danger is removed the appliance immediately seals itself and is ready for acting again.

House Sanitation Company.

The House Sanitation Company, 15A Baker Street, W., show the "Kallio" metallic triple-jointed airtight cover for manhole chambers, the "Kallio" accessible iron gullies, the "Kallio" traps for scullery sinks, the "Kallio" brass scour-traps for lead-lined sinks, "Kallio" cone air-inlets, "Kallio" interchangeable stair-treads and "Kallio" fence spur-nail. The principle of the air-tight cover consists in the cover and frame having turned and ground bevelled faces, which are truly seated by a vertical guide joint, also a supplemental lute-joint filled with oil or soft soap, which acts as a lubricant to the faced joints. Thus a triplet of joints insure security against the escape of gas from inside the chamber, or penetration of water from the outside. In the accessible gully the trap dip is formed by means of a cast-iron bucket dropped into water; this is removable for cleansing purposes, and when taken out it displays an important feature, viz. the entrance (horizontal) to the drain-pipe is left clear so that the drain rods can easily be passed through the pipes, and any obstruction that might occur in or at any point in the drain is easily removed. The cone air-inlet has a narrow-coned neck to increase the velocity of fresh air through drains, and the smallness of the talc valve renders it more certain in its action of closing over the cone and thus preventing any return of foul air reversed by the discharge of water through the drains.

F. Willis & Astley.

Messrs. F. Willis & Astley, 34 Ely Place, Holborn Circus, E.C., show a fireproof and ventilating floor as the lightest, strongest, and most perfect ventilating system. This flooring is constructed with steel joists, concrete arches and terra-cotta lintels. The lintels are designed in such a manner that they completely encase and protect from fire the joists upon which they rest, and are so constructed as to form a continuous air chamber through the floor. Thin corrugated curved iron placed between the webs of the lintels serves as a permanent centering, and forms the concrete into arches springing from joist to joist, thereby gaining the advantages of great strength and extreme lightness; the bulb tops of the lintels being embedded in the concrete are by that means firmly fixed and held. The weight is carried by the joists and concrete only, the lintels simply serving as a fire-resisting covering protecting the metal and concrete, and forming a flat fire-clay ceiling, keyed to receive plaster; the entire space between the underside of the concrete arches and the flat ceiling being available

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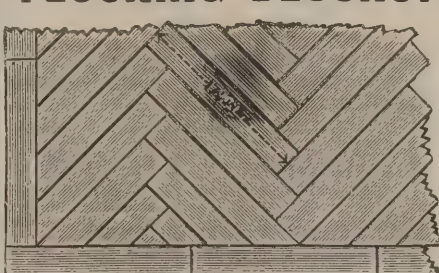
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for the purpose of ventilation by means of circular holes cut through the ceiling. This chamber can be connected with the rooms below, and thus enable all foul air and smoke to be drawn away into flues formed in the walls, fresh air being admitted through gratings in the outer walls, thus a constantly changing current of air is allowed to circulate freely between the ceiling and the joists. Should a fire occur, the joists and concrete by this means are insulated from the heated ceiling of the rooms below. It is partly due to the circulation of air that it is claimed that the system is absolutely fireproof. The lintels are all fixed at right angles to the joists. They are easily cut and fitted to any irregular-shaped building, and can, if necessary, all be inserted after the joists are fixed, leaving no gaps whatever, and requiring no making up in any way with inferior material. Trimmer joists, and in many cases main girders, can be protected by the lintels (as shown in the longitudinal section) in a manner that is quite impossible with any other system. The minimum depth of the floor is 6 inches, and the dead weight is only 40 lbs. per foot super. The strength of the floor is simply dependent upon the joists used. Floors can be constructed to carry any weight desired. We understand that the whole of the fireproof floors in connection with Messrs. Lloyd's new premises are on the Willis & Astley system.

The Mechanical Inventions Syndicate, Limited,

of 4 Tokenhouse Buildings, E.C., show the "Eclipse" door-check and spring, a very ingenious and admirable invention for application to doors, as it does not get out of order or require attention. No one can slam the door if they try to do so; the door will close, but after its own sure and gentle method. It also allows the door to open full width. This handy little appliance should be inspected.

William Johnson.

Mr. William Johnson, Castleton Foundry, Armley, Leeds, exhibits a patent sanding apparatus for making stock-bricks, which can be attached to any ordinary pugmill, and which is largely used on the Continent, and with which two lads can turn out 10,000 stock-bricks per day. As the material issues from the pugmill sand is sprayed over it. Thus the combination pugmill brick and tile-making machine performs four processes of hoisting, crushing, pugging and moulding, and forms a complete plant in itself, fitted with a patent automatic sander and presser, which sands and presses the bricks as they

issue from the die of the machine. By the use of the Belgique friction power screw press all patterns and sizes of ornamental roofing tiles and similar goods can be pressed, and its principle, it will be seen, is applied to other machines shown for pressing purposes.

Dubois d'Enghien Brothers.

Mr. William Johnson also shows at his stand a new system of kiln, of which he has taken up the sole agency for England. A model of the kiln is exhibited. It is on an entirely new principle, and gives double the economy of fuel over the "Hoffman" type of kiln, and is adapted for burning all kinds of best goods, enamelled bricks and terra-cotta ware. The great economy in fuel over other existing continuous kilns also recommends it for burning ordinary bricks. It is also more simple to work than any other kiln. According to the model shown the kiln is fired from the bottom, and not from the top, and the bricks completely chambered off so that there is no possibility of admixture of dirt, cinders, &c., there being two lines of parallel chambers. Wood, peat, &c., can be used instead of coal if necessary, and another advantage is the large amount of drying space provided. Besides economy as to fuel the draught is equable throughout, the burning and cooling are effected gently and progressively, and the firing being from the bottom, no chimneys are necessary, filling is rendered easy, and delicate ware can be burnt and turned out. Heat can also be easily transmitted into upper floors for drying purposes. There seems to be no difficulty in any ordinary workman managing the operations. The same system, we understand, can be had for use as an intermittent kiln. This new kiln is evidently the more appreciated as it gets known. It was invented by Messrs. Dubois d'Enghien for the burning of bricks, tiles, pipes, paving tiles, fireclay goods, enamelled and glazed ware, earthenware, &c.

A. T. Cooper.

Mr. A. T. Cooper shows a most useful and efficient suction and vacuum pump. The article is really one that would prove useful in every house. It might be thought from its name that it is something cumbrous, while in reality a casual glance would reveal nothing more formidable, apparently, than a stick with a sucker or rubber disc attached to it, notwithstanding its great power. It is a special sanitary appliance for removing obstructions in closet traps, drains, soil pipes, baths, sinks, stack-pipes, &c.

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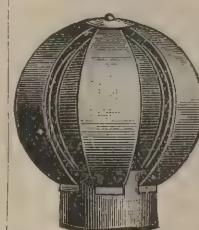
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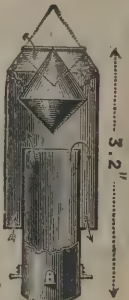
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John Whitehead & Co.

Messrs. John Whitehead & Co., Albert Works, Preston, Lancs., show their brickmaking machine No. 6, three-process, viz. for crushing the clay, pugging, and moulding it into bricks, and which can be made into four-process by addition of hauling gear; the machine has all Messrs. Whitehead & Co.'s latest improvements, adjustable roller bearings, &c., and is easily driven. Brick and tile-making accessories are also shown.

Francis & Co., Limited.

Messrs. Francis & Co., Limited, Bridge Foot, Vauxhall, Nine Elms Brand Portland Cement Works, show samples of cement manufactured and partially manufactured, and specimens of plaster, Keene's and Parian cements, also whitening; cement casks, and "Michele's patent" automatic cement-testing machine. This is a very interesting one to inspect, as it enables the visitor to see practically the constructional merits of the process and also various methods for decorative purposes. Specimens are shown which exemplify the adaptability of the manufactured material for construction of any kind of building and architectural work, including columns, arches, vaulting, &c., the solid work being composed of Thames ballast and cement in proportion of six to one. The samples of scagliola worked from Parian marbles into columns, &c., show what can be effected for ornamental and decorative purposes. Messrs. Francis & Co. have carried off prize medals at many international exhibitions in competition with home and foreign competitors. They justly claim that their "Nine Elms cements" have a reputation of some ninety years' standing, having been largely used in all manner of works requiring special strength and durability. The Company have carried out numerous works for Her Majesty's Government in this country and the empire generally, i.e. on which "the sun never sets"; for the late Metropolitan Board of Works, the County Council, for Docks and Harbour Boards, lighthouses, railways, waterworks, and numerous other miscellaneous public and private contracts, also for the French Government, for the United States, and South America, Japan, China, Turkey, &c.

Geo. Waller & Co.

Messrs. Geo. Waller & Co., Phoenix Engineering Works, Park Street, Southwark, and Stroud, Gloucestershire, have an exhibit that is well worthy of the attention of architects and builders. Their well-known specialties are shown and do not require describing, as our small space will only allow of

referring to one or two of the articles exhibited. What is new is Waller's patent hygienic air-tight and gas-tight cover, which should be inspected, as a well-designed appliance for hermetically sealing intercepting and inspection chambers, manholes, drain inlets, cesspits, grease traps, syphon tanks, &c., the aim having been to introduce the best principles of such covers without reproducing their defects. The door is secured by a cross-bar on the under side, the ends turn under the seating when tightened by the screw in centre of the door, making the joint perfectly air, gas and water tight. An air-tight cover and shoe combined, extensively used by London and provincial School Boards, has this extra advantage—that if for any reason the down pipe needs to be removed, there is no danger of breaking the socket, as so often happens with an earthenware shoe. Over ordinary safety gratings or side entrance covers, Waller's patent side entrance or manhole cover has a distinct advantage, being devised to meet the requirements of a cover that can be used as a ventilator, open or closed, whilst men are working below, not necessitating the attendance of a watchman to prevent accidents arising through passengers not noticing the obstruction. With regard to the cesspool pump, designed for sewage purposes, one that will not choke, Mr. E. R. Boulter reports to the Bexley Local Board on the first year's working that 367 cesspools were emptied, including 105 beyond the parish boundary. There was no difficulty in disposing of the material, and after allowing 20 per cent. for depreciation, there was a net profit of 150/ for the first year, and 200/ for the second year. A sunk street orderly bin is something of a novelty, and is decidedly an improvement on previous forms. It is largely used in various towns. The sunk bin offers no obstruction to the traffic, and is easily worked. One half the door is opened for filling the bin, and for emptying it the whole door is opened, one half folding down on the other; the galvanised pan is then lifted out and emptied into the cart. A model is exhibited of a patent concrete-mixer for steam or hand-power, showing the action of the apparatus and mixing of the concrete, being one of the cheapest of methods. Among penstocks is the improved circular penstock, and among tide-flaps is one that deserves attention, originally designed, and now largely used where sewers have little fall. An improved disc-flushing valve is characterised by the introduction of an improvement, one as simple as could be, and therefore the more effective and valuable. The valve is made more reliable by having two wedges instead of depending upon the hinge and

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Eyes for Ditto.
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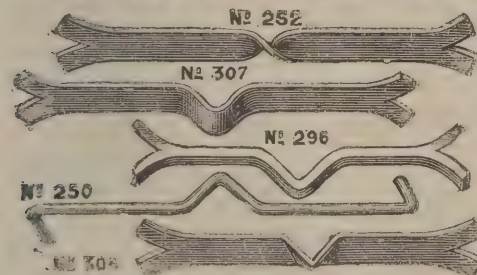
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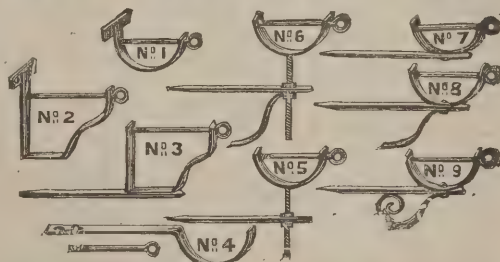
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Specialty Locks, Fittings, &c., for Matching Old Work, kept in stock or made to order.
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Manufacturers of all kinds of Butchers' Hooks and Fittings, Shelf Brackets, Improved Spout Irons and Wall Ties (see drawings), Shutter Flaps, Staples, Holdfasts, Vine Fittings and Wire Stretchers of every description, &c. Black Japanned, Galvanised and Tinned Ironwork to pattern or order.

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SOLE MAKERS—E. L. BERRY, HARRISON & CO.,
Electric Light Engineers, LYRIC CHAMBERS, WHITCOMB STREET, W.C.

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pin at one side for keeping it tight. The lifting-rod is also jointed so as to occupy less room when the valve is full open. We can only in addition call attention to automatic check-valves for basements, preventing flooding from storm-water, &c.; to special kinds of gulley gratings, soil-pipes and branches, &c., which, however, are worthy of a detailed description.

C. G. Wood & Co.

Messrs. C. G. Wood & Co., of 104 High Holborn, W.C., are showing some very fine specimens of zinc-stamping, wrought-iron hinges, balustrades in wrought-iron and cast-zinc; also their great specialty, cast-zinc letters for advertising purposes, together with a complete dormer window in zinc. Their exhibits also consist of some very fine heads of lions in stamped zinc, zinc rain-water pipes and cistern heads, shoes, elbows, nozzles, &c.

T. Potter & Sons, Limited.

This firm's stand, No. 100, has a good exhibit of artistic and general iron and brass metal work, &c. Among their exhibits we specially notice their examples of wrought-iron. A small grille with lattice centre formed by being threaded through reversed joints and culminating at each corner with scrolls terminating with roses. A handsome staircase panel from the design of the late Mr. F. Cockerell, quaint handles, bell-pulls, fire-dogs, fire-irons, fenders, and last, but not least, the picture frames, which commend themselves to our notice as an exceptional artistic example of British workmanship, one being a cluster of roses, supported by lilies and small flowers; in the frame is an oil painting, the design and make of which, also the painting, were executed by the same man. The brass goods in this exhibit are on the same level as the iron, being splendid specimens of work and material, and consist of eagle and desk lecterns, candlesticks, crosses, vases and other church furniture, brass fenders, fire implements, stoves in iron and brass, iron mantelpieces, &c. With reference to stoves for heating infirmaries and other buildings, their thermohydric stove appears to be specially suitable; it is on the principle of a hot-water apparatus without the trouble, as the boiler is fitted in an ordinary open stove, and for large rooms is fitted in the centre of room with descending flues which are swept from the outside. They are very economical in consumption of fuel, and always give great satisfaction wherever supplied; they have been in use for sixteen years. The wrought-iron railings, gates, &c., for the Royal Courts of Justice, the Midland Goods Extension, St. Pancras, the famous riding school at Welbeck for the

Duke of Portland, and other large work on the estate, were executed by this firm, who also have just supplied one of their brass eagle lecterns, the celebrated Southwell pattern, to Lincoln Cathedral.

Charles Rees.

Mr. Charles Rees, of 203 St. John Street Road, E.C., has for his exhibit a display of metalised wood decoration for houses, ships' cabins, cornices, &c. We are informed that the process has already stood a trial of nearly ten years, with unvarying success, as applied to furniture, interior house and structural decorations, and that Mr. Rees can with great confidence recommend its use for high-class work, more especially when a thoroughly artistic effect is desired without special reference to the question of cost.

G. M. Beer.

Mr. G. M. Beer, Pancras Chambers, 90 and 91 Queen Street, Cheapside, E.C., shows his patent vulcanite cement roofing for rendering flat roofs available as gardens, playgrounds, drying-grounds, &c., and as a cheap, durable and advantageous material, also building felts and kindred materials. This cement roofing (Haeusler's patent) it is claimed has obtained a reputation for durability and economy, having been adopted with uniform success in Germany, Austria, Hungary, Russia, Italy, France, Algiers, Egypt, &c. It enables roofs to be made flat, insures dry and healthy garrets with an equal temperature, and is specially adapted for factories, warehouses, Government buildings, barracks, dwelling-houses, shops, &c. It is watertight, snowproof and fireproof, and extremely durable.

Samuel Wright & Son.

Messrs. Samuel Wright & Son, Crown Works, Amhurst Road, Hackney, show most excellent specimens of fibrous plaster decorations for ceilings and cornices, examples of fibrous plasters, columns, capital and basis; also samples of fibrous plaster slabs as supplied to ceilings and partitions for ordinary use, forming *in toto* a most effective exhibit.

Tangyes, Limited.

Messrs. Tangyes, Limited, 35 Queen Victoria Street, E.C., show one 7 horse-power nominal Tangyes' gas engine, indicating 16 horse-power and 13½ horse-power actual, Otto principle, Pinkney's patent, driving a dynamo for electric lighting of various stands. Also an assortment of jacks, westons and chain blocks, and other builders' lifting appliances.

LYCEUM THEATRE.

THE PATENT FIREPROOF & SOUNDPROOF PARTITIONS

HAVE BEEN EXECUTED BY

W. POUNTNEY, Sole Agent for London, and Contractor.

This Patent Partition is constructed of Blocks or Slabs of Plaster material, formed with a series of longitudinal Tubes of Fireproof Material to deaden sound, each block being keyed to the adjoining one by light Iron Clamps, the whole being afterwards plastered on either side, and forming a rigid soundproof and fireproof construction.

When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4½ brickwork partition walls. The thickness from face to face is only 3 inches, thus *saving enormously in weight and space.*

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

W. POUNTNEY, 13 VICTORIA ST., WESTMINSTER, Sole Agent for London, and Contractor.



B. WARD & CO.,

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CONCRETE STAIRCASES.

Formed in Situ or Cast and Fixed.
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Equal in Appearance to Stone. Durable.
Moulded or Plain. Will not turn Slippery.
30 per cent. Cheaper than Stone.

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STANTONFORD SANDSTONE.

This Stone possesses the following qualities: Dense, even in texture throughout, non-absorbent, the highest specific gravity of any stone. Entirely free from carbonates of lime, so that no acid impurities can affect it. The appearance is of a rich warm colour, which it retains. Architects are invited to specify the above stone. Full particulars and Professor Atfield's Report of Analysis sent on application.

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 particulars and samples free.

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The Patent Victoria Stone Company, Limited.

This company, 283A Kingsland Road, N.E., have a handsome and representative collection of their well-known specialties on view at the Hall. The patent Victoria stone is used for every purpose that natural stone can be applied to, practically to numerous uses that natural stone cannot be applied to, as special varieties of natural stone would have to be selected to serve the many purposes that the Victoria stone is used for. In building it is used for steps, staircases, balustrading, window heads and sills, also for paving, for sinks, coping gully traps, &c., and for ornamental vases, &c.

Dartford Cement Company.

The Dartford Portland Cement Company, of Dartford, Kent, show Portland cement extremely finely ground. The whole of the cement turned out by this company is found to be very fine. When sifted through a sieve of 5,776 meshes to the square inch (known as a 76 mesh sieve), it leaves a residue of less than 5 per cent. or less than 1 per cent. residue on a 50 mesh sieve. This is considerably finer than cement supplied by most other makers. The residue, which consists of imperfectly ground particles of clinker, possesses, as is well known, absolutely no cementitious or binding properties whatever, and hence a cement that contains a large proportion of this "residue" is to all intents and purposes practically as much adulterated as if it contained so much sand. When, however, this "residue" is ground up, the actual volume of the cement is increased and its strength intensified. A larger proportion of sand or other ballast may be safely mixed with a cement ground as fine as that of the Dartford Portland Cement Company, and it is thus more economical to use and cheaper in the long run.

Norris & Henty.

Messrs. Norris & Henty, Limited, 235 Upper Thames Street, E.C., exhibit the "Robinson" hot-air engine and fan; "H. R." (Horace Robinson) gas-engine; Gardner dynamo and arc light; 4 h.-p. "H. R." gas-engine; "Robinson" hot-air engine with pump; one 3 h.-p. gas-engine; one 1 h.-p. gas-engine; one hot-air engine and pump combined; one small hot-air engine; one small dynamo and arc lamp. The "H. R." patent gas-engine marks a great advance in gas-engine design and practice. It is made either with or without self-

contained water tank, the engine bed itself forming the tank in the former case, both kinds being shown. The exhaust valve, which is the only machine-moved valve in the engine, is operated by an ordinary eccentric, thus not only doing away with the usual lay shaft, gearing, cams, &c., but also making it possible in a few minutes to reverse the direction of the engine's motion. The engine is particularly well adapted for electric lighting and other purposes in which a smooth action is a necessity. The impulses are given regularly, thus avoiding sudden jerks and negative actions, and insuring great evenness of speed. A new patent governor of very simple construction maintains a regular supply of gas, which is checked or augmented to the requirements of the engine, and admits of no waste. The speed of these engines can be varied in a few seconds while they are running, thus rendering them especially suitable for electric-light work. The smaller sizes may be safely run up to 250 revolutions per minute, at that speed rendering available for driving purposes upwards of 75 per cent. of their indicated horse-power, and consuming 20 cubic feet of gas per indicated horse-power.

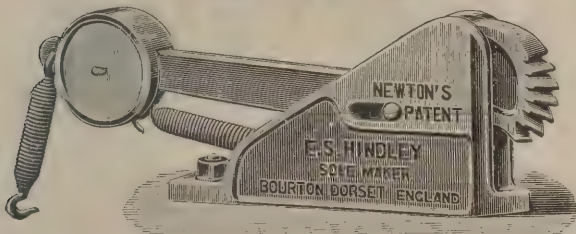
T. C. Williams & Sons.

We described last week the exhibit of Messrs. J. C. Williams & Son, of London Street, Reading. "J. C. Williams & Son" should, however, have read "T. C. Williams & Sons." In addition to what was said last week of the beautiful fire ranges shown by this firm, we might add that strength, solidity and durability has been one of the chief aims in their manufacture. The ventilating radiators for hot water or steam-heating provide a large heating surface in small compass, and these can be made in any ornamental style desired, fitted and suited for many and various purposes.

Humpherson & Co.

Messrs. Humpherson & Co., sanitary engineers, Beaufort Works, 297 Fulham Road, S.W., show a variety of improved valve and pedestal closets, and the "Beaufort" flush-down basin and trap in various qualities, improved syphon cisterns, gullies of many kinds, and manhole covers for drains, a grease gully with air-tight cover, improved gully for sink waste pipes, &c., patent pipe joint for connecting soil pipes with closet traps, drain interceptors, patent and improved taps of many kinds, lavatories in various patterns.

PATENT **SAFETY GRIPS.**



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Can be fitted to existing Hoists.

LIFTS, *Hydraulic, &c.*
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Unlike all other Sprinklers, the **GRINNELL** is constructed entirely without Springs, Screws, Hinges, and other Mechanical make-shifts, so liable to derangement.

IT IS THE LEADING FIRE APPLIANCE OF THE DAY.

DOWSON, TAYLOR & CO., LTD. LONDON: 14 Victoria St., S.W.
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The Midland Glazed Brick Company, Limited.

This company show a wall of white glazed bricks, capped with a course of brown enamelled bricks. These bricks are of great durability, being made of a ferruginous clay, and glazed with a hard, imperishable enamel, well burnt in, and which will not craze, and it is difficult to chip. They are true in make and uniform in colour, and find a ready sale in London. Mr. T. Freeman, of Phoenix Street, does the whole of the company's business in London and the Home Counties.

Ellis, Partridge & Co.

Foremost amongst the chief displays of goods on show are this firm's tastefully decorated stands, upon which are exhibited a large variety of splendid specimens of their red bricks—rich in colour and absolutely true in make—viz. pressed facing bricks, moulded and ornamental goods, ventilating bricks, &c. A special feature of their exhibits is a large entablature for date, made and burnt in one piece, with rich moulded frame, entirely free from fire cracks, the one great difficulty which has to be overcome in the working of most red clays. The clay of which these goods are made is thoroughly weather-resisting, and being particularly adapted for this class of work, the most delicate patterns can be produced, and as shrinkage is especially uniform, complete accuracy in detail may be relied upon. This firm now take a leading position in supplying bricks for important public and private buildings in the Metropolis.

Marsden Tile Company.

The Marsden Tile Company show a very tasteful and elaborate variety of tiles forming dados and stove decorations of a high class. This company has made spirited progress of late years, some of their rich tints and judicious designs ranking with those of older and better known firms. We understand that Mr. Freeman, of Phoenix Street, Westminster, is interested in this exhibit.

MR. A. T. MACER, of Cheapside, has purchased from Messrs. Carey & Lewis their Crouch End and Hornsey business. He has also taken into partnership Mr. Edward Charles Fitzwilliam, M.A. Oxon., who will undertake the management of the Crouch End office.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

5091. Thomas Aston and Thomas Aston, jun., for "An improved water-tap."

5099. Walter Whitley, for "Improvements appertaining to sliding windows or sashes."

5152. John George Russell, for "Improvements in or relating to set squares."

5205. Richard Samuel Wood, for "Improvements in hanging bars."

5229. Erik August Bolinder, for "Improvements in water-taps or valves."

5290. James Catt, for "Improvements in ventilating appliances."

5330. James Cadoux Hudson, for "Improvements in fire-escapes and carriages, and carriages for conveying them."

5366. Augustus Robert Harrison, for "Improvements in cowls of chimneys and ventilating shafts."

5370. Gaston Adolphe Marie Duguenoy, for "Improvements in and relating to levels."

5480. James Adams, for "Improvements in adjustable door-springs."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

JUDGE LUSHINGTON has decided that the Aldershot Local Board were not availing themselves of the best and most practical means of obtaining a satisfactory effluent, and has imposed a fine of 20*l.* for each of three specified dates the river Blackwater was fouled, giving the plaintiffs (the Hartney Wintney Sanitary Authority) costs.

WITHOUT KITCHEN FIRE.

HOT WATER INSTANTLY, NIGHT OR DAY.

EWART'S LIGHTNING GEYSER.

346-350 EUSTON ROAD, N.W.

THE

Architect and Contract Reporter.

SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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ADVERTISEMENT SCALE.

For Two Lines and under (eight words to the line)	£0	2	6
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For Half Page	.	4	10
For a Page	.	8	8
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Paragraph Advertisements, Two Shillings per line.

On pages preceding and following matter, special rates.

Public Companies' Advertisements, 12l. 12s. per page; 1s. per line.

Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

TENDERS, ETC.

* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GILLINGHAM.—April 6.—Alternative Designs are invited for a School in Three Departments. Mr. E. T. Atchison, Local Board Offices, Gillingham, Kent.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

LONDONDERRY.—May 1.—Plans are invited for proposed Baths and Washhouses. Mr. Robert N. Chambers, Guildhall, Londonderry.

CONTRACTS OPEN.

ACTON.—April 12.—For the Tar Paving of the Playgrounds and Yards at the Priory and Beaumont Park Board Schools. Mr. W. A. Brown, Board Room, Priory Schools, Acton, W.

ALNWICK.—April 7.—For Building House. Mr. George Reavell, jun., Architect, Alnwick.

ASHFORD.—April 12.—For Erection of a Coal Store. Mr. C. D. Hume, West London District School, Ashford, Middlesex.

ASHFORD.—April 12.—For Building Coal Store at West London District School. Mr. C. D. Hume, Clerk to the Managers, Ashford, Middlesex.

BLOXWORTH.—April 10.—For Additions to School. Rev. O. P. Cambridge, Rectory, Bloxworth.

BOURNE END.—April 10.—For Construction of Iron and Steel Viaduct over the Thames. Mr. G. K. Mills, Secretary, Paddington Station, W.

BOURNEMOUTH.—April 7.—For the Taking-up Existing Sewers in Spencer, Frances, Derby, Northcote, Lytton and Holdenhurst Roads, and Substituting of (C. I. and Stoneware) Sewers of from 3 feet 6 inches in Diameter, including the Construction of No. 13 Manholes, and other Works in Connection therewith. Mr. F. W. Sacey, A.M.I.C.E., Town Hall, Bournemouth.

BOURNEMOUTH.—April 9.—For Works of Tar Paving and other Works in Connection therewith, in the Various Paths in the Roads within the Borough, to the Extent of about 5,500 Yards. Mr. F. W. Sacey, A.M.I.C.E., Bournemouth.

VERITY BROS. CALL LANE, LEEDS.

Manufacturers of their High-Class

ROLLING BOLT, MORTICE & RIM LOCKS,
NIGHT LATCHES, &c.

In our Deadweight Lock as per drawing herewith, we have so applied the different Movements that the pressure is equal in both ways of turning the knob, and we guarantee their giving entire satisfaction.

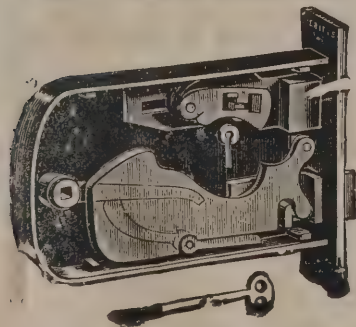
We are also Manufacturers of—

The largest Varieties of Openers suitable for Skylights, Fanlights, &c., which can be fixed in any position.

Casements in Wrought Iron, Steel, and Gun Metal.

Espagnolette Bolts, Weather Bars, Sash Fasteners, Door Checks.

CATALOGUES FREE BY POST.



BRIDGEND.—April 7.—For Construction of Boiler-house, Boiler Settings, Chimney-stack, Engine-house, Foundations for Plant, &c. Mr. J. H. Dyer, Manager of the Gas and Water Company, Bridgend.

BRISTOL.—April 18.—For Building Board Schools at Eastville. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BURNLEY.—April 7.—For Supply of Cast-iron Pipes. Mr. S. Edmondson, 18 Nicholas Street, Burnley.

BURY ST. EDMUNDS.—April 10.—For Taking-off and Re-laying with New the Lead on Roof of the Nave of St. Mary's Church and for Sundry other Work. Mr. John Codd, 16 Hill Road, St. John's Wood.

CARDIFF.—April 11.—For Building Head Post Office. The Secretary, H. M. Office of Works, 12 Whitehall Place, S.W.

DURHAM.—April 7.—For Additions, New Stabling, &c., to Bell's Folly. Mr. H. T. Gradon, Architect, 22 Market Place, Durham.

EBBW VALE.—April 6.—For Building Primitive Methodist Chapel and Schoolroom. Rev. W. Taylor, 1 Prospect Place, Brynmawr.

FULHAM.—April 9.—For Building Three Fever Blocks, Mortuary, Coal Store, Discharge Room, &c., at the Western Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

FULHAM.—April 11.—For Making-up and Paving Gtton Road. Mr. W. J. H. Denselow, Town Hall, Walham Green.

GLASGOW.—April 9.—For Supply and Erection of 130-Ton Crane, Cessnock Dock. The Engineer, Clyde Navigation Chambers, 16 Robertson Street, Glasgow.

GRAYS.—April 12.—For the Supply of 500 Tons of Granite or Quartzite, of the kind or quality to be specified by the Tenderer, Broken so as to Pass through a 2-inch Ring in every Direction, for Metalling Roads. Mr. E. C. Hatton, 53 High Street, Grays.

HASTINGS.—April 8.—For External Repairs and Structural Works at Queen's Hotel. Mr. George Meadows, Havelock Road, Hastings.

HORNCASTLE.—April 7.—For Restoration of Hameringham Church. Mr. C. Hodgson Fowler, F.S.A., Architect, Durham.

KINGSTON-ON-THAMES.—April 12.—For Building Four Shops. Messrs. F. & W. Stocker, Surveyors, 90 and 91 Queen Street, Cheapside, E.C.

LEEDS.—April 9.—For Construction of Lavatory at the Union Offices. Mr. John King, Clerk, Union Offices, East Parade, Leeds.

LEWISHAM.—April 10.—For Kerbing and Tar-paving the Footpaths and Channelling and Metalling the Roadways of Hurstbourne Road (part of), Forest Hill; Kent House Road, Lower Sydenham; Felday Road, Lewisham; and Mercy Terrace, Ladywell, as separate Contracts. Mr. Edward Wright, Board of Works Offices, Catford.

LIVERPOOL.—April 9.—For Additions to Industrial Schools, Kirkdale. Mr. H. J. Hagger, Vestry Clerk, Kirkdale.

LLANWYDDA.—April 9.—For Building Board School. Mr. Lewis Pritchard, Rhostryfan.

LONDON.—April 9.—For Repairs at Asylum. Mr. F. W. Bailey, Cleveland Street, Asylum, W.

MANSFIELD.—April 12.—For Additions to Girls' Grammar School. Mr. Wm. Bryan, Clerk to the Governors, 30a Westgate, Mansfield.

MIDLAND RAILWAY.—April 6.—For Painting, &c., to Station Buildings and House Property, at (1) Lancaster, Halton, Hornby, Wennington, Bentham High and Settle Junction. (2) Bell Busk, Gargrave, Hellifield and Skipton. (3) Keighley, Apperley Bridge, Calverley, Normanton, Cudworth and Barnsley. (4) Teversall Branch, Kimberley, Watnall and Attenborough. (5) Cleaning and Painting Station Buildings and Rental Property, &c., at Gresley, Moira, Ashby-de-la-Zouch, Swanningham, Coalville, Bardon Hill, Bagworth, Desford, Kirby, Muxloe, Glenfield and Ratby. (6) Hereford (Moorfields Goods), Credon Hill, Moorhampton, Kinnersley, Eardisley, Whitney-on-the-Wye, Hay and Glasbury. (7) Forge Mills, Castle Bromwich, Water Orton and Saltley. (8) Stoke Works, Droitwich Road, Dunhampstead Spetchley, Wadborough, Pirton, Defford, Eckington, Breedon Cleeve, High Street, Cheltenham, and Crossing Houses; and for Erection of House for Station-master, at Sea Mills, near Bristol. Mr. James Williams, Derby.

MORRISTON.—April 10.—For Pulling-down and Rebuilding the Rose and Crown. Mr. J. B. Ferguson, Architect, 28 Cradock Street, Swansea.

MOSS SIDE, MANCHESTER.—April 10.—For Construction of Tanks, &c., at Sewage Farm, Urmston. Mr. J. Bowden, C.E., Engineer, Manchester.

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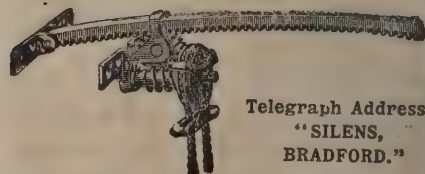
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NEWBURY.—April 10.—For Reconstruction in Iron and Brickwork of Bridges. Mr. G. K. Mills, Secretary, Paddington Station, W.

PUDSEY.—April 14.—For Building Four Terrace Houses. Mr. Herbert Hodgson, Architect, 27 Kirkgate, Bradford.

RADNORSHIRE.—April 25.—For Construction of Aqueduct (10½ miles) from Dolan to Knighton. Mr. James Mansergh, Engineer, 5 Victoria Street, Westminster.

RAMSGATE.—April 19.—For the Erection of a Harbour-master's House at West Cliff. Mr. William A. Valon, Borough Engineer.

RAMSGATE.—April 19.—For the Erection of a Customs House. Mr. W. A. Valon, Borough Engineer.

RAWMARSH.—April 7.—For Building Residence. Mr. J. Platts, Architect, Old Bank Buildings, Rotherham.

REDDISH.—April 9.—For Constructing about 3,200 Yards of Pipe Sewers. Mr. McCallum, Engineer, Manchester.

ROTHERHAM.—April 6.—For Building Pair of Semi-detached Houses. Mr. J. Platts, Old Bank Buildings, Rotherham.

ST. HELENS.—April 11.—For the Construction of a Main Intercepting Sewer, Earthenware Pipe Sewer and all Works in Connection. Mr. Wm. Jno. Jeeves, Town Hall, St. Helens.

TOTTENHAM.—April 10.—For the Supply of 200 Tons, more or less, of 6-inch by 4-inch Guernsey Granite Pitchers, at per Ton, delivered in the High Road, South Tottenham. Mr. P. E. Murphy, Coombes Croft House, High Road, Tottenham.

TOTTENHAM.—For Erection of Block of Schools to Accommodate 1,295 Scholars at Bound's Green. Mr. J. F. Adams, School Board Offices, Tottenham.

UPMINSTER.—April 19.—For Taking-down and Rebuilding Cockleburn Bridge. Mr. H. Gibson, Clerk to County Council, Chelmsford.

USK.—April 10.—For Construction of Passenger Station, Goods Shed, &c. Mr. G. K. Mills, Secretary, Paddington Station, London, W.

WILLINGTON.—April 17.—For Taking Down and Rebuilding the Pit Laddie Hotel. Mr. W. Cook, Architect, 59 Saddler Street, Durham.

THE memorials of the late Dean of Lincoln are to consist of an enlargement of the parish church of Wantage, and a recumbent figure in Lincoln Cathedral. Mr. Bodley, A.R.A., will have charge of both works.

TENDERS.

BLACKPOOL.

For Lighting the United Methodist Free Church, Adelaide Street, with Electric Light.

Briscoe & Shaw, Blackburn	£129	0	0
Scott & Mountain, Limited, Newcastle-on-Tyne	118	0	0
J. McLellan, Blackburn	105	0	0
F. Stewart, Blackpool	98	11	6
Corlett Electric Engineering Company, Wigan	95	0	0
Fowler, Lancaster & Co., Limited, Birmingham	87	10	0
W. J. Proctor, Nuneaton	87	9	6
Paterson & Cooper, Dalston	87	0	0
E. Dewhurst, Blackpool	79	15	0
Donnison & Parmiter, Manchester	77	10	0
T. H. Churton, Leeds	75	0	0
B. Verity & Sons, Manchester	70	12	0
MAUNSELL MERCIER & CO., Manchester (accepted)	70	0	0

The tenders include electroliers.

Edison, Swan & Co., Manchester	57	10	0
Baxendale & Co., Manchester	55	0	0
Bowker Bros., Preston	53	0	0
Crabtree & Harrison, Blackpool	53	0	0
W. Banks & Co., Bolton	45	0	0
J. Berry, Preston	42	12	6
Furnis, Paterson & Co., Newcastle	38	0	0

These tenders do not include electroliers.

BRADFORD.

For Engineering Works at Thornbury, Bradford. Mr. THOMAS BARKER, Architect, 5 Bond Street, Bradford.

Accepted Tenders.

J. Coates, Vignola Street, mason	£1,790	0	0
J. Taylor, Park Road, joiner	950	0	0
Haley & Co., ironfounder	481	10	0
E. & S. Hodgson, plumber and glazier	342	0	0
Hill & Nelson, Edmund Street, slater	197	5	0
T. Cordingley & Son, Manningham, plasterer	106	0	0
S. W. Walton, Frizinghall, painter	78	18	0

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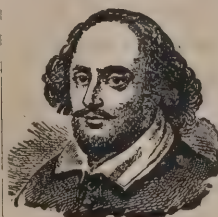
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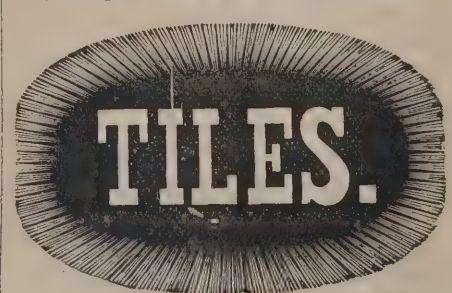
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For the Erection of Engineering Works, Stables and Stores (exclusive of any Ironwork or Flooring), for Messrs. Luke & Spencer, Limited, Manchester. Mr. G. TINNISWOOD, Architect, 5 Osborne Road, Stockport. Quantities by the Architect.

Broadhurst & Co, Stockport	£4,750	0	0
Hampton, Manchester	4,532	0	0
Macfarlane, Manchester	4,509	0	0
Lawton, Ardwick	4,369	0	0
Neill & Son, Manchester	4,293	0	0
Megarthy & Co., Manchester	4,284	0	0
Green, Ardwick	4,275	0	0
Brown & Son, Salford	4,242	0	0
Southern & Son, Salford	4,240	0	0
Hamilton, Altrincham	4,167	0	0
Storrs, Sons & Co., Stalybridge	4,148	0	0
WM. THORPE, Manchester (accepted)	4,095	0	0

FECKENHAM.

For Building Board School for Infants at Astwood Bank, Feckenham.

Highest tender	£1,560	0	0
J. BRAZIER, Bromsgrove (lowest and accepted)	1,000	0	0

KETTERING.

For Erection of Boot and Shoe Factory and Offices, Wood Street, Kettering, for Messrs. Loake Bros. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Good-year Chambers, Northampton. Quantities by Architects.

C. & F. Henson, Kettering	£4,565	0	0
G. V. Henson, Kettering	4,541	0	0
A. Barlow, Kettering	4,431	0	0
G. Henson, Wellingborough	4,376	5	0
F. Barlow, Rothwell, Kettering	4,366	2	0
Gregory & Son, Northampton	4,278	0	0
T. & C. Berrill, Little Irchester	4,271	0	0
Brown & Son, Wellingborough	4,235	0	0
W. Clow, Kettering	4,216	3	6
G. Wilson, Kettering	4,212	16	0
J. Garrett, Northampton	4,149	0	0
W. J. Payne, Kettering	4,124	10	0
Dunham & Bass, Kettering	4,062	0	0
JOHNSON & SON, Earl's Barton (accepted)	3,878	8	0
Surveyor's estimate	3,960	0	0

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C. A. Hemingway, Richmond	£5,681	0	0
Crompton & Co., London	4,925	0	0
H. South, London	*		
C. Smith & Sons, Birmingham	4,159	0	0
J. Blackburn, Nottingham	*		
Laing, Wharton & Down, London	4,152	0	0
A. H. Wood, London	4,121	0	0
E. M. Evans, Manchester	4,086	0	0
J. Defries & Sons, London	*		
Bourne & Grant, London	3,986	0	0
T. Barton, Blackburn	*		
Brush Electrical Engineering Company, London	3,980	0	0
Paterson & Cooper, London	3,915	0	0
W. A. Shaw & Co, Stockport	3,897	0	0
Graham & Biddle, London	3,873	0	0
Lea, Sons & Co., Shrewsbury	*		
R. Barnett & Co., Newcastle	3,865	0	0
Sharp & Kent, London	3,859	0	0
A. F. Joel & Co., London	3,789	0	0
Fowler, Lancaster & Co., Birmingham	3,733	0	0
Marryatt, Lillywhite & Co., London	3,726	0	0
J. E. Collum & Co., Leicester	3,657	0	0
Walsall Electrical Company	3,657	0	0
B. Verity & Sons, Manchester	*		
Johnson & Phillips, London	3,651	0	0
New & Mayne, London	3,611	0	0
Manchester Edison-Swan Company	3,585	0	0
Donnison, Parmiter & Barber, Manchester	*		
Maunsell Mercier & Co., Manchester	3,527	0	0
Baxendale & Co., Manchester	3,445	0	0
T. H. Heywood, Manchester	3,061	0	0
J. D. F. Andrews & Co. (to different specification)	3,047	0	0
SPAGNOLETTI & CROOKES, London (accepted)	3,034	0	0

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For Building Girls' School and Additions to Infants' School, for the Ipswich School Board. Mr. E. F. BISSHOPP, Architect, Ipswich.			
C. Roper, Ipswich	£3,377	0	0
T. Thwaites, Ipswich	3,030	0	0
E. Catchpole, Ipswich	2,994	0	0
Girling & Coe, Ipswich	2,947	0	0
Everett & Son, Colchester	2,946	0	0
F. Dupont, Colchester	2,899	0	0
Pells & Son, Ipswich	2,875	11	7
Grimwood & Son, Sudbury	2,725	0	0
F. BENNETT, Ipswich (accepted)	2,690	0	0

LIVERPOOL.

For Alterations, 27 and 29 Water Street, Liverpool. Mr. H.				
HULME, Architect.				
	Contract No. 1.		Contract No. 2.	
Rowlands & Thomas	£363	0 0	£1,045	0 0
J. Henshaw & Sons	353	0 0	1,080	0 0
Chappel	331	10 0	1,077	0 0
McClive & Rimmer	330	10 0	1,136	0 0
Raffel & Campbell	330	0 0	1,035	0 0
S. Webster	305	0 0	1,197	0 0
Brown & Backhouse	296	0 0	1,015	0 0
J. Taylor	280	0 0	1,040	0 0

LONDON.

For Additions to White House, Ebury Bridge, for Mr. Robert Burleton. Mr. WILLIAM HUNT, Architect, 5 York Buildings, Adelphi, W.C. Quantities by Mr. G. SILVESTER, 46 Strand.			
Patman & Fotheringham	£4,263	0	0
H. & E. Lea	3,993	0	0
W. Antill & Co.	3,990	0	0
Chas. Horton	3,843	0	0
H. Burman & Sons	3,780	0	0
F. G. Minter	3,700	0	0
A. E. Todd	3,575	0	0
W. D. Palmer	3,525	0	0
G. Godson & Son	3,394	0	0
TURTLE & APPLETON (accepted)	3,370	0	0

LONDON—continued.

For the Erection of the Rosebery Avenue Branch of the L. & S.-W. Bank, Clerkenwell, for the Directors. Mr. E. GABRIEL, Architect, 42 Old Broad Street, E.C. Quantities by Messrs. G. R. TASKER & SONS, 38 John Street, Bedford Row, W.C.			
	Bank.	Fitting.	Total.
Tennant & Son	£7,616	£358	£7,974
Higgs	7,400	350	7,750
W. Shepherd	7,228	367	7,595
Scharien & Co.	7,050	341	7,391
Gould & Brand	6,929	415	7,344
Young & Lonsdale	6,864	385	7,249
W. A. Prior	6,895	315	7,210
Smith & Sons	6,739	385	7,124
Carmichael	6,214	365	6,579

MANSFIELD.

For Alterations to Moot Hall, Mansfield, for Messrs. Smith & Brown. Mr. R. FRANK VALLANCE, Architect, Mansfield. BAKER (accepted)			
	£334	6	0
Six Tenders received.			
For Building Two Shops and Showrooms, Leeming Street, Mansfield, for Mr. W. H. Robinson. Mr. R. FRANK VALLANCE, Architect, Mansfield.			
BAKER (accepted)	£324	10	0
Eight Tenders received.			
Shop and Show Cases.			
ROE & SONS (accepted)	210	3	8
Eight Tenders received.			
For Enlargement of Tobacco Factory, for Mr. G. Nuttall, Clerkson Street, Mansfield. Mr. R. FRANK VALLANCE, Architect, Mansfield.			
J. GREENWOOD (accepted)	£475	0	0
Three Tenders received.			

NORTHAMPTON.

For Conversion of Two Houses into Shops and Additions, Kettering Road, for Mr. W. Wheeler. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Goodyear Chambers, Northampton.			
E. D. Sharman, Northampton	£290	0	0
J. W. Walls, Northampton	285	0	0
J. Pettitt, Northampton	275	0	0
T. J. Nevett, Northampton	273	2	6
R. HICKMAN, Northampton (accepted)	250	0	0
Surveyor's estimate	260	0	0

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VARIETIES.

LORD ARMSTRONG has proposed to purchase Bamborough Castle, Northumberland, and to endow it as a convalescent home. As at present it is used for Lord Crewe's Charity, the consent of the High Court to the sale will be necessary.

AN offer of 5,000l. has been made to the Liverpool Corporation towards the establishment of a central School of Science, Technology and Art, on condition that equal or greater assistance be given by the Corporation.

THE trustees of the Harris Institute, Preston, having accepted a tender amounting to 13,000l. for erection of a technical school, although possessing only 10,000l., have appealed to the Town Council for the balance. The council have declined to grant the money.

MR. A. FOWELL BUXTON, having presented the London County Council with copies of the two figures found in Herculaneum, known as *The Wrestlers*, they have been set up in the Embankment Garden near the statue of the late John Stuart Mill.

PROVOST ORCHAR presided at the opening of the Dundee Graphic Arts Association. He said that what they wanted was not so much technical education in the shape of handicraft, but the cultivation of taste in art and colouring. From 40,000,000l. to 50,000,000l. a year was paid to Germany and France annually by this country for fancy articles, attractive on account of their design and colour.

AN exhibition has been held in Edinburgh of the work executed in the Edinburgh and Leith Plasterers' Technical School, which is supported by the trade with the aid of a grant by the Town Council. The pupils receive instruction free of charge. Freehand and architectural drawing and modelling are the subjects taught, and a considerable number of apprentices and young journeymen attend the classes.

THE east window of Coddensham Church, Suffolk, is now fitted with stained-glass. The three lights, which are very large, picture the Adoration of the Shepherds and the Magi. In the openings of the tracery are on one side the figure of St. Gabriel, and on the other side the figure of the Blessed Virgin, and in the centre a lily with a scroll bearing the word "Ave." The window is erected in memory of Sir Richard Wyles by his sons.

STAINED-GLASS now fills the east window of Mary Tavy Church. It is a three-light Perpendicular one, the stonework of which has been restored by Mr. Edmund Sedding. The subject illustrated runs through all the lights, and is under elaborate canopies of the period. It depicts a vision of our Lord in glory, surrounded by kings, bishops, men and women, indicating all states of the Church triumphant. Above the head of our Lord is held an elaborate crown, supported by two flying angels. The donor is the Rev. J. K. Anderson, vicar of the church.

THE Duke of Westminster presided at a meeting of subscribers to the Royal Alexandra Hospital, Rhyl, on Saturday, when it was resolved "That the secretary be instructed to obtain estimates for the carrying out of the work as soon as possible, and also that the building committee set to work at once in regard to building on the old site."

THE summer excursions of the London Geological Field Class on Saturday afternoons, under the direction of Professor H. G. Seeley, F.R.S., commence on the 21st inst., when the members visit Wanborough and Guildford. Particulars can be obtained from the Hon. Sec., Mr. R. Herbert Bentley, 31 Adolphus Road, Brownwood Park, N.

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NEGOTIATIONS are in progress for the construction of a pier, with landing-stage and pavilion, at Seaford, at an estimated cost of 12,000*l.*, and for another at Littlehampton, costing 10,000*l.*

THE church of South Ferriby, Lincolnshire, has just been enriched by the addition of a stained-glass window, in memory of the father, mother, brother and sister of Mr. James A. Veitch, of Harrogate, the donor. It is in three lights, that on the left illustrating the Presentation in the Temple, the centre light the Lord Blessing Little Children, and the right light the Baptism of our Lord. The whole is under canopies of fifteenth-century work. In the tracery are four Evangelists and the emblem of St. Andrew, which is the name of one of the memorialised persons. The arms of the family are also introduced.

MR. J. BADGER, the chairman of the Bromsgrove School of Art, is so well satisfied with the wrought-iron work produced by the local nailers in the classes that he proposes to form a limited liability company in order to utilise their ability.

A BILL has been introduced in Parliament to authorise the expenditure of 15,000*l.* out of the Sutors' Fund on improving the Law Library in Dublin, which is a danger to all who enter it.

AN arbitration was lately held in Leeds before Mr. Bidder, Q.C., to determine the value of a strip of land containing 835 square yards, required for the new post-office. The sum awarded is 5,225*l.*, or nearly 6*l.* 5*s.* a yard.

SIR JOHN STIRLING MAXWELL has presented the city of Glasgow with a piece of ground extending to about two acres in the district of Pollokshields, and in the vicinity of Titwood Parish Church.

THE report of the Board of Trade on the Railway, Canal, Tramway, Gas and Water Bills deposited for the Session of 1894 states that the total number of Bills relating to these subjects is 127, as compared with 134 in the Session of 1893, and the total amount of money 22,146,305*l.*, as compared with 30,063,670*l.* last year.

AT the meeting of the Salford Town Council it was resolved that early application should be made to the Local Government Board for power to amend the building regulations in force in the borough. Various members of the Council expressed the opinion that there was need for additional stringency in the matter, as buildings of a very undesirable character were being erected in various parts of the borough.

IN regard to the Inverness Gasworks arbitration, Mr. Murdo Paterson, C.E., has issued his decision. Mr. Roderick Fraser, the contractor for the excavation works of the new gasometer, made a claim of 626*l.* for extras, and the arbiter has now fixed the award at 599*l.* In case of Messrs. Newton, Chambers & Co., 164*l.* was allowed as extras, making the total amount paid, exclusive of expenses of arbitration proceedings under this heading, 763*l.* The gasometer itself, exclusive of the cost of the excavation works, was 6,180*l.*

AT a meeting held in Edinburgh under the auspices of the Edinburgh Merchants' Association, a resolution was adopted approving of the formation of a canal between the Firths of Forth and Clyde of sufficient depth and width for the largest vessels. It was decided to approach the Government with a view to its assistance in carrying out the project, and the meeting formed itself into a committee to further the scheme.

MR. SHAW LEFEVRE informed the House of Commons on Friday that it was hoped a beginning would be made with the new buildings at South Kensington next year. By the completion of a number of new and heavy works in the course of the present year, a sum of 60,000*l.* would be set free, so to speak, without substantially adding to the vote for public buildings next year. A sum of 4,500*l.* was asked for this year to provide temporary accommodation for the staff, who are employed in the "boilers," which will have to be cleared away to make room for the new buildings. Mr. Aston Webb's designs have been approved for the buildings.

TRADE NOTES.

THE whole of the stone carving of the Tower Bridge has been executed by Mr. C. H. Mabey, of Vauxhall Bridge Road, S.W., and also the models for the ornamental ironwork.

WE understand that the Red Star Glass Works Company, Marchienne-au-Pont, Belgium, have nominated Messrs. Corfield-Smith & Co., 9 Billiter Square, London, E.C., as sole agents in the United Kingdom for the sale of their well-known "Red Star" brand of window-glass.

THE foundation stone of the enlargement of St. Mary's Church, Woolwich, Mr. J. O. Scott, Architect, will be laid tomorrow (Saturday) by Lord Roberts. St. Aldhelm box ground stone is used for outside and Farleigh Down for interior, from the quarries of the Bath Stone Firms, Limited, Bath.



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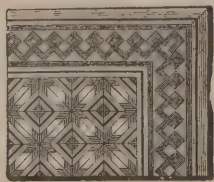
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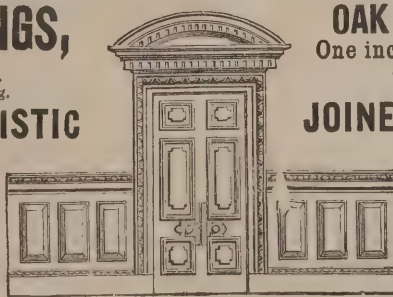
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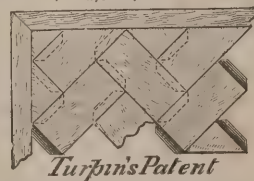
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System of Preparing for Laying Inch Block Floor on Concrete, Stone, and Deal Floors.

Section of wood block floors



Turpin's Patent

Concrete floor

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THE WESTMINSTER PATENT FLOORING COMPANY.

THIS enterprising company have just opened new show-rooms at 73C Queen Victoria Street, premises in close proximity to the Mansion House Railway Station, most conveniently situated, being readily accessible from any part of the Metropolis and for all visitors to town, an advantage which will be appreciated by the general public, who can thus inspect for themselves these varied styles of floors which their architects have recommended for use. The company are contractors not only to H.M. Government, but to many corporations, school boards, guardians, vestries, county councils, &c. A line will suffice to speak of the company as manufacturers of patent block, parquet and mosaic floors. An inspection of the show-rooms will, however, be sufficient to prove that a very large amount of space could be filled with descriptive matter, and yet a great part of what might be written would have to be omitted. The following remarks must therefore be taken as suggestive, and not entirely as a detailed description. Some of the varieties of flooring may be particularised as follows:—The patent "disc-key" block (with patent expansion joints), the cheap ordinary block; solid parquet (1 inch thick) for new houses and better class work, and thin carpet parquet ($\frac{1}{4}$ -inch thick), for covering old, worn and uneven or shrunken floors; hardwood long floors (special tongued and grooved); wooden gratings, for hot-water pipe trenches; trench covers (in block); mosaic marble flooring, Granito, Venetian Trazzo and Roman; mosaic ceramic, and wood block and creosoted paving for yards, roads, stables, &c.

The accompanying engravings illustrate the patent disc-key block floor. The company are able, we understand, to provide this floor at a more reduced price even than before. A fuller description, however, will be of interest in connection with the engravings, showing the patent disc-key block floor, including expansion joints, with concrete fixing blocks and patent expansion joints to prevent floor rising, being guaranteed against defects as the soundest and best floor for standing true on surface, and cheap in manufacture and laying. The blocks are grooved along the side, and two "disc-keys," AA, are placed in the corners of each block as shown on illustration, thus bonding it to six other blocks and binding the whole floor together into one compact piece. At the time the concrete is laid rows of dovetailed bonding blocks (4 inches by 4 inches by $2\frac{3}{4}$ inches) are fixed at intervals of about one yard, and iron nails are driven into them and attached to special "disc-keys" BB,

which tie the blocks firmly to the sub-structure. These nails do not show on the surface, and thus any unsightly holes, plugs or wafers are avoided. (*See engraving.*) The bonding blocks to hold the nails are made of specially prepared tough concrete, which, unlike wood, will not shrink, decay or burn, and to which the cement concrete bed perfectly adheres. After a short time the nails hold tighter and firmer in this material than in wood. The discs are of galvanised iron, and being less than 1-16th inch thick, the blocks are not materially cut away. A thinner floor may, consequently, be laid, which is a considerable saving in expensive hardwoods. The blocks are laid in a strong asphalte mastic, which preserves the wood and forms an adhesive joint between the pieces and in the dovetailed grooves. For heavy traffic, floors of foreign prepared blocks, similar to those laid in Board Schools, laid in the ordinary manner are frequently considered preferable. The blocks are hard and will wear well. The price being naturally lower, floors laid on "disc-key" system are recommended for superiority both in appearance and firmness. Looseness or unevenness of the blocks after they are planed is prevented. The patent expansion joints (*see engraving*) are introduced to prevent the rising and blowing up of dry parquet and block floors when subjected to the damp of newly constructed houses. The spreading of a large floor is considerable if of dry wood. Frequently sufficient time cannot be allowed to dry the concrete and walls. Washing and wet traffic also cause swelling and subsequent shrinkage, and the expansion joint is designed to meet this difficulty. The mastic asphalte being slightly elastic, play is then allowed to any movement of the wood.

The advantages of the thin carpet parquet $\frac{1}{4}$ inch thick do not require enlarging on. Special attention should be called to the wooden perforated gratings for hot-water pipe trenches, which are peculiarly well suited for churches and public buildings, &c., instead of iron gratings, which are slippery and disagreeable to walk on, these wooden gratings being very ornamental in effect. Trench covers formed of the patent disc-key blocks are also used extensively, and among other bodies by the London County Council for their weights and measures stations. There is a movable trap arranged, and the cover can be removed easily without sliding and again replaced. Radiators above the floor distribute the heat, the pipes being below in the trench. Besides hot-water pipes the trenches are serviceable to carry electric casings, water and gas pipes. The hard-wood long floors for covering old floors is tongued and grooved in a peculiar way, so no conditions can prevent the formation of a

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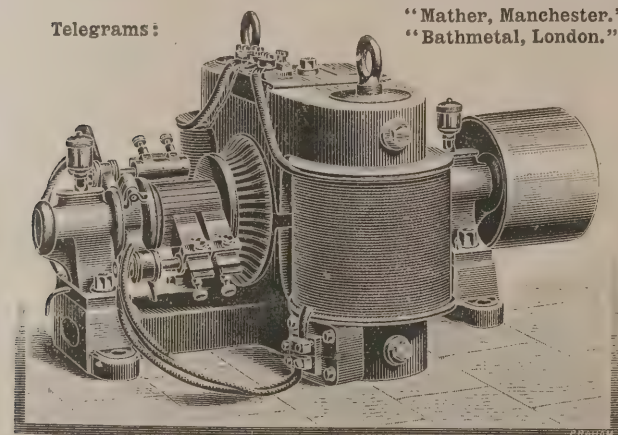
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157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



perfect joint—the joints being practically invisible. The subject of marble and ceramic mosaic floors brings us at once to the subject of design, and we must first refer to the wood floor patterns, those shown being excellently designed, and should produce grand and rich effects very simply. Here the

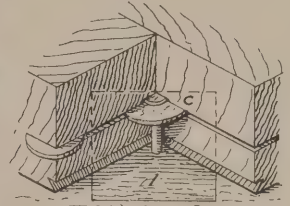
on the combination of different coloured marble tesserae, but in the Venetian work some very pleasing results are gained by introducing more of a set design. Old Roman figured mosaic paving is familiar to most, and the company show this style of work admirably well executed after the old Roman. "Cave



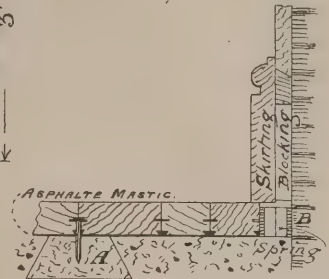
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value of a visit to the showrooms of the company comes in, as the play of light and shade cannot be reproduced in any engraving. In addition, the combination of the various precious and different coloured woods harmoniously combined are an important element in the design. The mosaic pavement work is very fine in granito, Venetian, &c. These depend principally

Canem" is a subject after an old piece of Roman pavement discovered in the City of London. There is much vigour about the old Roman work which distinguishes it from later and Mediaeval work, and the company have apparently hit on the salient principles that guided the old Roman workers.

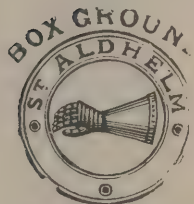
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ILLUSTRATIONS.

FIGURE FROM ALTAR-PIECE, STOURBRIDGE.

MENTMORE, BEDS., FROM THE GARDENS.

LORDSHIP LANE HALL, S.E.

NATIONAL BUILDING TRADES EXHIBITION.

THE exhibition closed on Saturday night, much success having attended it throughout. The following notices will conclude our description of the exhibits :—

Höfler, Raum & Co.

The collection of enamelled terra-cotta produced by M. Alfred Brault, jun., for whom MM. Höfler, Raum & Co., of 25 Bartlett's Buildings, are the sole representatives in Great Britain, was not only fascinating, but revealed a class of decorative work that increases the available resources of all artist-architects. The house of Brault has been long associated with French art, and in the course of years invaluable models have been amassed. The examples shown might be considered as tests of the most difficult class. A chimneypiece was French Renaissance in style. It was in brown and bronze green, on an ivory ground—an arrangement that was effective. The sides showed caryatids with satyrs' heads. At the back was an alternate arrangement of small enamelled plaques, with others bearing heraldic escutcheons. A series of panels of the frieze of *Archers* from the palace of Darius at Persepolis was a masterpiece. It was a full-size reproduction of the famous work in the Louvre, which was secured for France by M. and Madame Dieulafoy. As the original is probably as brilliant to-day as it was three thousand years ago, it testifies to the durability of enamels. The copy faithfully realised the style of the ancient frieze, which is a model of architectural decoration in its simplicity, vigour and effectiveness. Two life-size figures from statues by Allegrain and Canova were remarkable, as each was produced as a single piece. The graceful contours lost nothing in the process. Among other decorative works may be mentioned a pair of lions, which were one-half life size, and adapted for the decoration of stairs, landings, &c., pilasters,

newels, friezes, vases, masks, gargoyles, &c, all being in excellent style, refined in detail and exceedingly moderate in price. The entrance and exit of the stall were provided with balusters, which were excellent in design and colour, suggesting another class of production. There was also an admirable collection of wrought-iron panels, dogs and brackets, as well as specimens of the beautiful "Skytogen," which by its quality and the good taste of the ornament has secured the admiration of hypercritical judges. This leather paper has qualities that will excite the envy of the Japanese. The stall of Messrs. Höfler, Raum & Co. is not likely to be forgotten by any architect who studied it, and we look forward with interest to the appearance of the firm in next year's exhibition, for they are not the men who will be satisfied with a single victory. We recommend all architects who were unable to visit the Agricultural Hall to have a look at the showrooms of the firm.

Yates, Haywood & Co.

We give an illustration of one of the special exhibits that was shown, viz. the patent "Quadrant" kitchener, with lifting fire and open or close arrangement. The fire is self-adjusting, raised or lowered to any point by one hand, without any rack-work, for it works on the quadrant which is at back. One shown was a double-oven kitchen range, strong and well fitted



with continuous plate shelf, high oven in strong cast-iron, low oven in wrought-iron, strongly protected by cast-iron saddles, ovens ventilated by steam outlet pipes, bright banjo latch and hinges, bright bracket tables under ovens, wrought fall bar, with

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draw-out fret and rack, swing smoke plate, with coves, ashes pan and cinder sifter, castings rubbed, hot plate ground and blacked, and fitted of course with the patent self-adjusting quadrant lifting fire. One of the most useful of ranges—for the special purpose for which it was designed—was shown by this firm, viz. the Guinness patented self-setter range. It is used in the Guinness blocks of workmen's dwellings, the Peabody artisans' dwellings, &c. The object was, we believe, to furnish a range that would minimise the rough usage that ranges are likely to suffer under the circumstances for which these are supplied. One particular feature of the range is a draw-out oven. Thus when the oven is pulled out the least experienced person cannot help but clean the flues, which are then entirely open to view. The range can be taken almost entirely to pieces piecemeal, and therefore there is little expense in supplying a new piece in any case of damage having occurred, or repair being necessary. The range being self-setting is another great advantage. In regard to the Columbia Road buildings, Mr. Mervyn Macartney, the architect, wrote to Messrs. Yates, Haywood & Co. as follows:—"I am glad to bear testimony to the excellence of the Guinness range, which has quite got over our difficulty of smoky chimneys. It is an economical, strongly made range, and its patent lift-out oven makes it very easy to clean the flues. It is altogether an excellent range for small and poor families." And the secretary, Mr. John Pilkington, writes:—"I used your Guinness range for the above building, and am so satisfied with them that I purpose specifying them again for similar work in the future."

Charles Davis.

Mr. Charles Davis exhibited some of the high-class blinds and fittings for which the firm has so great a reputation, the work being of no common or ordinary description, high-class work being only undertaken. Mr. Charles Davis makes a specialty of his outside improved Spanish blinds, as well as of duchess lace-blinds of the newest designs and patterns, and the highest class venetians with the latest patent actions, cane and wire blinds, Japanese screens, &c. The firm's patent brass railway grooving laths and cornice poles are generally adopted by the trade and specified by the leading architects. The exhibit, however, conveys but a slight idea of the large business of the firm. A comprehensive illustrated price-list issued by Mr. Davis should be consulted to judge of the great variety of beautiful designs. Architects, builders and the trade will find

in them many useful ideas for exterior decoration. The works and offices are at 40 Castle Street East, Oxford Street, W.

Thomas C. Fawcett.

Mr. Thomas C. Fawcett, Whitehouse Engineering Works, Hunslet Road, Leeds, exhibited at work the Jubilee power brick moulding machine (Breething & Fawcett's patent) for making sand-faced bricks. This machine will make 12,000 to 15,000 (by double delivery), or 6,000 to 8,000 (by single delivery) perfect sand-faced bricks per day, free from sand flaws or air bubbles; in fact, a perfect solid brick, either best facings or common clamp stocks, and as the bricks are moulded much stiffer than by hand, they are not put out of shape by wheeling to hacks or drying floor, and one-third the usual drying ground is saved. It will mould any clay that can be moulded by hand, either light loam or the strongest clay. It is fitted with patent automatic sander, and effects a great saving in sand and labour. No wires are used, and the power to drive is little more than to drive an ordinary pugmill. The pugmill can be made to work either horizontal or vertical.

The Metal and General Agency.

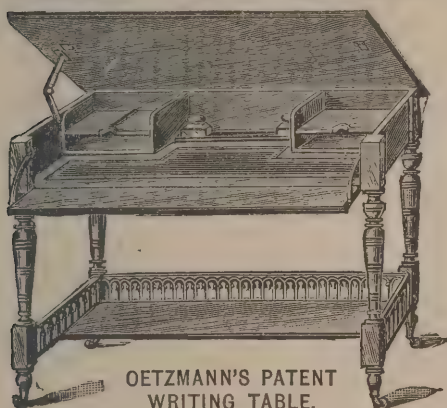
Messrs. Weager & Funk, 1 Whittington Avenue, London, E.C., showed a nice selection of variously designed wrought-iron stamped railing heads of best material and finish. These can be manufactured in all sizes and in any pattern. Wrought-iron stamped spanners were also shown, unfinished, finished and case-hardened.

J. Williamson & Co.

In our notice last week it was stated that the No. 513 Graphie stove, when lighted in the hall, showed an average oven temperature of 210 deg. Fahr. all the afternoon and evening. This temperature applied when it was an open fire, for when it is closed the temperature would easily increase to 350 deg. or more.

Aspinall's Enamel Company, Limited.

The Aspinall's Enamel Company, Limited, New Cross, S.E., had a very imposing and well-arranged exhibit, showing the merits—among other specialties—of their new washable water paint, "Wapicti." The claims for superiority made for this paint over others are:—It is durable as oil paint, at one-third the cost; that it produces a better surface than oil-flatted paint; that it is a disinfectant and antiseptic equal to carbolic sheet, without the offensive smell. No disease is possible



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Majewski & Bayenbach.

An interesting novelty was shown at Stand No. 153 in the Central Avenue. The samples displayed represented the latest and most successful attempt to harden gypsum or alabaster, so as to render it an efficient substitute for marble. This Messrs. Majewski & Bayenbach are now producing in a material indistinguishable from real marble, as hard, as durable, and as beautiful. The veins are those of the natural gypsum, continuous throughout the entire mass. Owing to the infinite variety of markings found in the gypsum almost any pattern, from the boldest to the most delicate, can be obtained; and by the inventors' process almost any colours can be imparted to the material. On account of its cheapness it can be used in the place of wood, paper, stucco, plaster, &c., as well as for most of the purposes for which marble has hitherto been employed.

R. & J. Dick.

Dick's patent gutta-percha, canvas and Balata belting was shown at Stand 88, and is characterised by uniformity of strength throughout, durability, &c. In addition to their other excellent qualities, most gratifying results have been obtained from Dick's belts as regards retention of strength. It has been proved that belts which have been running for over eight years not only retain their original strength, but show not the slightest signs of wear and tear.

Robert Fox,

at Stand 48, showed a model of portion of the dome roof of the Gresham Life Assurance Company's Office, Poultry, London, showing Fox's system of copper tiling, which also illustrates the large dome roof of the Stock Exchange.

J. B. Stone & Co.

showed woodworking machinery, as agents for the Fox Machine Company. The universal mitreing machine, the Fox patent trimmer, &c.

Babcock & Wilson, Limited,

at Stand 128, had a model of their water-tube safety steam-boiler, now in use to the extent of over 1,500,000 horse-power, for all steam-raising purposes, used for steam-heating, cooking, electric lighting, &c., in public institutions and private residences.

J. H. Sankey

exhibited improved gulleys and interceptors. A perforated bucket of galvanised iron intercepts and collects small stones, dirt, &c. This can be taken out and emptied, removing grease from gully.

Wm. Gibbin & Son

showed at Stand 98 draught-excluding sliding sashes in solid frames.

Workmen's Competition.

In the competition open to artisans of various trades, held on Friday evening, the most valuable class of medal was awarded to Mr. H. Hunt, who is in the employ of Mr. John Grundy, the well-known heating and ventilating engineer, whose exhibit at the Agricultural Hall proved so interesting to visitors and so lucrative to the exhibitor. The judges were Messrs. F. B. Dashwood, secretary of Clerks of Works Association; W. G. Drew, Adrian Hovydonk, J. Parker, of Birmingham; Walter Payne, of Bristol; Fred Tibbitts, of Birmingham; and Samuel Wright, of Hackney. The following is the list of awards given:—Bricklaying—C. Greenaway, H. Hunt, H. Allen, silver medals; Carpentry—T. J. Tripp, bronze medal; Plumbers—H. G. Mankin, silver medal; Plasterers—T. White and G. Jupp, silver medals; Tile Fixing—C. Vaughan, bronze medal; H. Lambert and E. Sutton, silver medals.

Among exhibits by other exhibitors, the Cyanite Paint Company showed samples of combined fireproof and damp-proof paints; Mr. C. Gray Hill, of Coventry, roofing tiles, bricks, finials, &c.; Mr. W. A. Burr, tubular ceiling in terracotta; Messrs. Hicks, Gardener & Co., bricks, tiles, &c.; Mr. Sydney Butler, woodworking machinery; Mr. Walter Dunn, ornamental doors and tables; Messrs. Gray & Batstone, improved window-frames and sashes; the Rosemary Hill Brick and Tile Company, roofing tiles; Mr. F. E. Clotton, peat-dust dry closets; Messrs. Kirk & Dickinson, window-sashes, Murray's brickmaking machinery.

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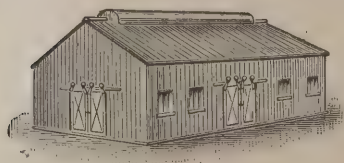
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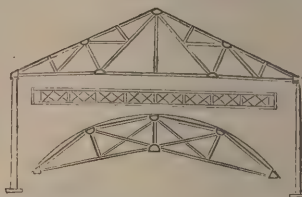
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A presentation was made to Miss Clausen on Friday evening, the 30th ult., in recognition of her kind services and the evenings rendered so pleasant by the presence of her company, the Pompadour Band. The following letter, signed by the committee, as below, was addressed to Miss Clausen:—

"A committee has been formed, consisting of the under-mentioned, to express on behalf of the exhibitors their sincere thanks to you and all the members of your able and brilliant company for the pleasure your charmingly-rendered music has afforded us every evening during the exhibition. Whilst greatly appreciating the whole of your varied programmes, we have specially enjoyed the national melodies; and if not presuming too much on your kindness, we venture to suggest, before the close of the exhibition, that a selection of English, Scotch and Irish airs would be particularly appreciated."

This exhibition compares favourably with previous ones, for in nearly every case the exhibits were in order, or nearly, on the opening day. During the exhibition it was possible to visit the various stands and find someone to explain the specialties displayed, though, of course, in some few cases, no one could be found to give information to visitors.

PUBLIC BUILDINGS (LONDON) BILL.

In a memorandum which has been issued with the Public Buildings (London) Bill it is stated that London local authorities, with three exceptions, have not now the power to purchase land for their public buildings, except by agreement. Two exceptions are the School Board and the Asylums Board, who can purchase compulsorily under the Lands Clauses Act, after public inquiry and obtaining the consent of the Local Government Board, who make a provisional order, which has to be confirmed by Parliament. Under the recent Act "parish councils" are given this power, and every local board also has it under the Public Health Act, 1875, and in one case in London (Woolwich parish) where the Public Health Act applies. To avoid the delay and expense caused by the want of this power for all other London local authorities this Bill provides that public buildings erected out of rates may be built in the most central and commanding position necessary for the convenience and architectural adornment of the locality on freehold land.

EXTRAS IN BUILDING.

THE case *Lintott v. Holloway* has been decided in the Brighton County Court. The plaintiff, a builder, claimed 38*l.* 3*s.* 4*d.*, balance of account for work done, defendant putting in a counter-claim for 5*l.* 1*s.* 9*d.*, and having paid 25*l.* into court. Plaintiff had contracted to build a stable for defendant for 285*l.*, off which 280*l.* had been paid, leaving 5*l.* due. Some additional work was done, for which 43*l.* 13*s.* 4*d.* was charged, but off this 10*l.* 10*s.* had been allowed for bricks and other materials supplied by defendant. The account was disputed and surveyors were called in by both parties, and the matter referred to the arbitration of Mr. Blaber, who awarded 34*l.* 1*s.* 6*d.* as a fair amount to be charged. This proving unsatisfactory, the dispute was brought before the court, and several witnesses were called on both sides to speak as to the value and quality of the extra work done, Mr. S. Denman, architect, valuing the extra work at 21*l.* 19*s.* 9*d.* as against 43*l.* 13*s.* 4*d.* charged, and Mr. Carden appraising it at 31*l.*, whilst other witnesses put intermediate values upon the work. There was a clause in the original agreement that 5*l.* should be withheld until Mr. Holloway had expressed his satisfaction at the work, or his surveyor had certified that the work had been completed. It was admitted that Mr. Denman (Mr. Holloway's surveyor) had written and signed a certificate that the work was completed, but it did not pass into Mr. Lintott's possession; and counsel for defendant contended that consequently plaintiff was not yet entitled to the 5*l.*, plaintiff's solicitor maintaining that the terms of the agreement did not necessitate the passing of the certificate to plaintiff, providing it was signed. His Honour disallowed the 5*l.*, as the certificate had not been given to plaintiff, but gave him a verdict for 39*l.* 11*s.* 6*d.*, less the 10*l.* 10*s.* agreed to be deducted for the materials supplied by defendant.

THE Glasgow Institute of Architects have appointed Messrs. David Thomson and John Gordon, on the suggestion of the Glasgow Master Wrights' Association, delegates with full powers for the revision of the rules for the measurement of wrightwork, and it was agreed that the Institute of Measurers should be invited to send an equal representation, in order, if possible, to secure the adoption of a uniform system of measuring wrightwork, and thereby remove the occasion of much needless disputing between parties, and promote harmony and good feeling among all concerned.

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Extract from THE GENTLEWOMAN (Mrs. PANTON) — "You can find all the furniture at Hewetsons', or if you are dubious of your own powers, you could either send me the pretty catalogue to mark, or my daughter could choose them next time she is in town, if you liked. The catalogue should certainly be seen; it is entirely a work of art, and most useful to country residents."



440.—English Carved Oak Writing Table, Leather Top, on Casters. £15 10*s.*

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RATING GROUND VALUES.

AT the meeting of the members of the Surveyors' Institute, held on Monday, there was a discussion on the paper read at the previous meeting by Mr. Howard Martin upon the report of the Local Government Taxation Committee of the London Council on the rating of ground values. Mr. Martin urged that the scheme was not one to take off the superfluity of large landowners for the relief of the poor occupying ratepayer, but to lay an extra tax upon the shoulders of everyone who owned a freehold, from the occupying owner of a "weekly" cottage or a 15-foot plot of land upwards. No doubt any proposal to tax income from all investments would meet with opposition from everyone who was thrifty or fortunate enough to have any investments at all, and in his judgment such a tax in any form was inexpedient, because it seemed desirable to encourage thriftiness and not to fine it. If such a course was really necessary it would be a wiser thing for our rulers to face the difficulty than to make use of the popular error as to the ownership and burdens of real property as a motive power to carry a measure which would be a direct injustice and hardship to many, and in the end would injuriously affect the prosperity of all. Mr. Charles Harrison, the vice-chairman of the London County Council, contended that the paper had been written under a misapprehension as to what had been or was proposed to be done by the Council. The drafting of the scheme must rest with the Government of the day, and the sole object of the Council was to arrive at a solution of the question, not from any political aspect, but as a social and economical matter. Certain broad propositions had been laid down by the Council for the consideration of the Government, and it was for the Government to settle whether these propositions were acceptable or not. The largest ground landlords in London, he mentioned in passing, were the Ecclesiastical Commissioners, and the annual amount of the rents for the land held by them was 320,000*l.*, a figure which was every year increasing. Mr. Harrison detailed at length the proposals of the Council, and dealt exhaustively with the contract question in connection with ground values. Mr. George Beken, Mr. J. R. Adams, Mr. F. Marshall, Q.C., and other speakers joined in the further discussion which ensued, and at its conclusion Mr. Martin was thanked for his paper.

A TOWN HALL, which cost about 12,000*l.*, has been opened in Newry. It was designed by Mr. W. Batt, of Belfast.

SOME POINTS ON BUILDING.*

IN taking this as a subject for a paper I do not intend to go into any of the many points on which I may touch with any degree of elaborateness from a scientific point of view, but merely the most salient from a constructional point, and on which so much depends sometimes—yes, often success or failure.

In proceeding, let us suppose we are going over the requirements of the ordinary everyday building. By this I mean one with which we are all familiar. We are consulted as to a building on a certain lot or site; its purpose is named. Consider well the surroundings (if of a permanent nature), the style of design best fitted for the requirements of the proposed building, and no matter for what purpose, let it speak for itself as far as practicable. By this I mean let your design give the ordinary passer-by an idea of its use—not by gingerbread ornament and signs, but by character and treatment. Let a "wholesale" be a plain, heavy, substantial-looking building; a bank a massive building of refined treatment; a school plain and substantial; a collegiate college or other public building Classic or of Classic feeling, plain, neat and substantial; the public building, with broad and lofty open portal or other entrance, simple in treatment and decoration. And, above all, let a church be a church, a model of perfection, perfect in every detail, and without sham.

All this you will say is a matter of cost, and seldom to be realised. Admitted to some extent it is, but work and advise to that end, and if then it cannot be got, do the best you can, always bearing in mind that what you do must be substantial, even if perfectly plain, and if this cannot be done with credit to yourself, better have nothing to do with it. But in most cases you can advise and prevail that more money be put in it, or the building cut down so that it may be fairly well done for the amount available.

Your design being satisfactory, see that the foundation is good—if not the rock—that your footings are good, of large stone flags and cement, piles and steel beams if necessary. The drainage being properly provided for from a sanitary standpoint, see that it is so put in, first that the intended grade and no more is taken out, or if by chance it should, that it is made

* A paper by Mr. J. Power, read at the fifth annual Convention of the Ontario Association of Architects, and published in the *Canadian Architect*.

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up with broken stone. Do not depend on earth, even if tamped in. Next see that the pipes to be used are of the best salt glazed and without blemish, laid with tarred rope of sufficient size to just fill the space or difference in size between pipe and fosset, tamped well up to the shoulder of fosset. Throw your level over them to be positive that there are no low spots; then have them well blocked under with stone, to prevent rolling. They may now be cemented. Try an occasional joint by passing your knife into the cement, to know that the rope has been tamped well to the shoulder of the fosset and be most particular that they are cemented all round, especial attention being given to the under side, and if satisfactory they are now ready for filling, which, however, should not be done until the cement is dry; then fill carefully with clay well rammed to the top of the pipes.

The masonry is probably the next to require our special attention, as too many, especially when building coursing or ashlar, will give you two very poor walls where but one is required by building up the face to as much as 2 feet before backing it up and bonding over. This should not be allowed for at most more than 1 foot, and then it should be well bonded.

See that all joists have $4\frac{1}{2}$ bearing, and are cut back that not more than two inches are in the wall at top edge.

When partitions are over one another, let the studs of the upper come down on the head of the lower and thus save settlement by shrinkage of joists and breakage or cracking of plaster in angles, to some extent. Where partitions meet walls have first stud well spiked to walls.

I will now pass on to the question of plumbing, one I need hardly state of the most important to the profession to-day. In laying down your system avoid placing the pipes against outside walls, burying them in cement or behind plaster as far as possible. The soil-pipe or drain should be of medium iron, well coated inside and out, with brass cleaners, whereby to remove any chance stoppage which might take place by the introduction of foreign matter, for such things will occur, even under the best of management. Introduce fresh air, if trap can be got 12 or more feet from building, or where there are no windows over, and run pipe through and well above roof, enlarged to prevent stoppage by hoar frost. Before fixtures are set have openings plugged and system tested by filling with water. Vent all traps with pipe of same size into standing vent. Have all fixture connections made with brass and rubber, and all lead joints properly wiped and gasketed, funnels run and

caulked to cast pipes. After fixtures are set, subject the whole system to a second test of either smoke or oil of peppermint. In short, have it done in the best possible way; put in no more than what is really necessary and can be done in a thoroughly sanitary and substantial way.

LIBELLING BUILDERS.

A MEETING of the Glasgow City District Lunacy Board was held on Friday last. Among the subjects considered was a letter from Messrs. James Heibertson & Sons, contractors for the joinerwork at Gartloch, calling attention to a statement made by Mr. Blair at the preceding meeting of the Board, to the effect that all the work being done at Gartloch was unsatisfactory, and that it was a weekly occurrence to reject material and object to work. Although not named by Mr. Blair, still they were certainly included in this sweeping assertion, and, so far as they were concerned, the statement was quite untrue, and they considered it only due to themselves to ask the Board to get Mr. Blair either to confirm the statement as regarded them or to withdraw and apologise. In the event of neither of these courses being adopted, it would remain with them to take whatever steps they considered necessary in the circumstances.

Mr. M'Kenzie moved that the Board should take no notice of the letter. He considered that, as a public representative, he was entitled to fairly criticise any work in connection with the undertaking; otherwise his usefulness as a member of the Board would be destroyed, and it would be a great detriment to the public interest.

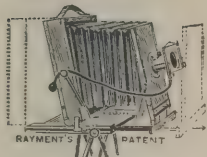
Mr. Campbell seconded the motion. He thought that Mr. Blair was not only entitled to make the observations, but the Board was entitled to protect him. If the Messrs. Herbertson thought that they had any claim against Mr. Blair or any member of the Board for anything said at the Board, it was for them to take what action they thought proper, and the Board had nothing whatever to do with that.

Mr. Bowman said he thought Mr. Blair would be acting wisely if he apologised for perhaps having hastily said things he ought not to have said.

Dr. Chalmers remarked that Mr. Bowman had taken up an erroneous position. He did not think Mr. Blair had said anything against the Messrs. Herbertson. Mr. Blair was there to protect the public, and he did not see why the Board should not uphold him.

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Mr. Mitchell suggested that the matter should be allowed to drop. He thought Mr. Blair had only acted as any other member of the Board might have been expected to have done.

The Chairman asked if there was any other specific motion.

Mr. Bowman: No; I do not think it is a matter for us to interfere with. But I think Mr. Blair's remarks were far beyond fair criticism, and Mr. Herbertson or any other tradesman was quite entitled to call upon him to make an apology for the language he used. We are here to criticise, but let us do it in a fair and legitimate way, and not denounce tradesmen as rogues and vagabonds, which it was equivalent to.

Mr. M'Kenzie: Do not make these statements, because you are not stating what is true. I have here the extract which is quoted in the letter of Messrs. Herbertson, and upon which they found their charge. The extract is as follows:—"Mr. Blair called attention to the manner in which the work was being done at Gartloch. He said the master of works had very frequently to reject materials and object to certain work, and he thought the master of works' journal should be brought before the Board at every meeting, that the members might see how the work was being carried out." You see he did not make the statement that they were rogues and vagabonds.

Mr. Bowman: I did not state that he said they were rogues and vagabonds. I said it was an equivalent.

Mr. M'Kenzie: Well, what is the difference?

Mr. Bowman: A man that commits fraud is a rogue and vagabond. Is that not an accusation of fraud to have to reject materials? Mr. Blair had no right to apply it to tradesmen without founding on something specific, which I asked him to do again and again, but which he has not done yet.

Mr. Ogilvie said he thought that the letter should be acknowledged as a matter of courtesy, and that it should be added that the Board had the utmost confidence and satisfaction in the work done by the firm.

The Chairman suggested that the clerk might reply that the Board had no control over the individual expressions of opinion of any of the members.

Mr. Bowman: That is so. We do not endorse the statements of Mr. Blair.

The matter then dropped, it being understood that Mr. M'Kenzie's motion that the letter be laid on the table and a reply sent simply to that effect, was agreed to.

Mr. Blair, at a later stage, moved that the clerk of works' journal should be submitted regularly to the Board meetings. He observed that it would be intolerable if those who devoted

time and what ability they had to the interests of the rate-payers were to be browbeaten and pestered with communications such as that already read on the slightest possible pretext.

The Chairman: We have already passed from that letter. I hope you are not now going to make a reply to it when you had an opportunity before. It would be very unfair. Keep to the point of your motion.

Mr. M'Kenzie: I understand he is simply showing reason why this journal should be here.

Mr. Blair: The Chairman cannot see it in that clear light, and hence this interruption.

Dr. Chalmers seconded the motion.

Mr. Ogilvie moved the previous question.

Mr. Bowman seconded the amendment.

Mr. Martin said he had considerable sympathy with Mr. Blair's motion. He did not think everything was going on so satisfactorily as some members seemed to think.

The motion was carried by seven votes to five.

MAINTENANCE OF STREETS AND ROADS.

A LECTURE was given at the last meeting of the Carlisle Architectural, Engineering and Surveying Association by Mr. J. Hepworth, C.E., on "Our Streets and Roads." Having referred to the favourable situation of Carlisle for procuring paving material, and also that notwithstanding this it is sometimes alleged that the cost of the present methods of paving is greater than the circumstances call for, he invited the views of the members present on the question as to whether there are any other materials suitable, but of a less costly character than granite or whinstone, that might be introduced. The lecturer mentioned the following requirements of a good carriage-way pavement:—It must be a sanitary pavement and as noiseless as possible. It must be safe for horses and afford a sufficient foothold with a minimum of traction. It must be as free from mud and dust as possible. It must be economical not only as regards first cost but also with respect to its maintenance and cleansing. It must be durable. It must be easily cleaned and non-absorbent of moisture. It must admit of being readily taken up and quickly relaid for repair at all seasons. He then proceeded to consider the advantages of tar paving as a class of pavement for which it is claimed that most of the above requirements are met at a proportionately small



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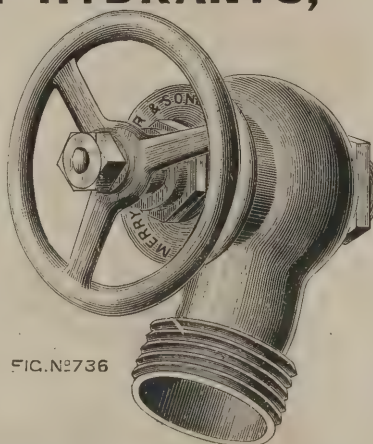


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cost, and remarked that although there is much difference of opinion amongst surveyors about its adoption, the towns of Cheltenham, Shrewsbury, Harrogate, Scarborough and Nottingham almost exclusively use tar paving in the principal and residential streets with great success, at a cost of from one-third to one-fourth that of granite and whinstone paving, and stated that on hygienic grounds tar macadam is undoubtedly to be preferred. The lecturer read several specifications for the mixing and laying of tar paving, and quoted the opinion of several authorities who, after a proper trial, have reported most favourably on its adoption in residential streets and back lanes. The objectionable feature of the smooth surface and the black look of the roadway are easily overcome by proper mixing and laying and the finished coat being made with a light-coloured and gritty material. A discussion followed.

THE ELECTRIC LIGHTING OF GLASGOW.

A PAPER on "The Corporation Electric Light Supply" was read to the members of the Institution of Engineers and Shipbuilders in Scotland by Mr. William Arnot, electrical engineer to the Corporation of Glasgow. He described in detail the machinery and other fittings at the Waterloo Street station, where, he said, they had made ample provision against any accident that might happen. The total output of the dynamos was 1,189,900 watts, or 1,190 units. Describing the underground work in the streets, Mr. Arnot said that a copper strip was laid on porcelain insulators in iron culverts, which were watertight. He did not mean that under a pressure they would keep out water, but owing to their construction, the lids overlapping the culverts, the ground in which they lay must be flooded before the water could rise high enough to enter through the seam. He had never known an instance of water in the culverts. Water did collect in the brick junction boxes, especially in Bath Street and districts where there was heavy clay soil. Provision was made in all such for their thorough drainage. Where it was not possible to lay copper strip, indiarubber-covered cables had been laid in cast-iron pipes. Faults in the underground mains were easily found by means of a compass needle. The needle was placed on the faulty conductor, and brought to be parallel with it by means of a strong directing magnet. The other conductor was flashed to earth, and the direction of the excess current due to the fault was noted. In this way it was easily traced. Nearly

all the faults were caused by careless workmen. The last fault was in Renfield Street, and was traced in half an hour. There were now 382 consumers, who had applied for a current of 15,487 ampères, which represented roughly 46,460 eight candle-power 33-watt lamps distributed somewhat as follows:—242 shops, 7,776 ampères; 21 warehouses, 2,680 ampères; 91 offices, 3,269 ampères; 3 churches, 229 ampères; 12 private houses, 275 ampères; and 13 clubs, hotels and theatres, 1,258 ampères. They had not had a year's run at the station yet, and it was therefore impossible to give figures as to cost of production, &c. It was only right that he should say that the successful issue of their winter's labours had been due in a very great measure to the staff that had worked with him, and he wished to express his personal appreciation of their services.

ZINC AND ZINC ROOFING.*

(Concluded from last week)

I WILL now mention some of the different systems of zinc roofing recommended by the Vieille Montagne Company and others. The roll-cap system is laid on boarding, and on this boarding, at intervals of about 2 feet 10 inches or 2 feet 11 inches c. to c., wood fillets are fixed while the roofing is being laid. These run from ridge to eaves. Roughly speaking, the sheets of zinc are laid between these rolls with their side edges turned up against the rolls, and the edges and roll are then covered with a capping of zinc. If the roof has a fall of 1 foot in 8 or upwards, then only a welt or fold joint at the junction of the sheets is required. In the case of flatter roofs, if possible a fall of 3 inches in 10 feet should be obtained. In such flat roofs, however, a drip should occur at about every 7 feet 6 inches. The drips should be 2½ inches deep, and not less than 2 inches, to allow the rolls to pass well under the projecting upper sheet.

If laid with the drawn roll the drip will require to be 3½ inches deep. Zinc flats may be set out with drips 8 feet 6 inches apart and 9 feet 6 inches apart for special cases, provided a sufficient time is given for the sheets to be specially rolled and prepared; but it is not recommended, as the long

* A paper read before the Northern Architectural Association, at the Art Gallery, Newcastle, by the hon. sec., Mr. Arthur B. Plummer, F.R.I.B.A., surveyor for the diocese of Newcastle.

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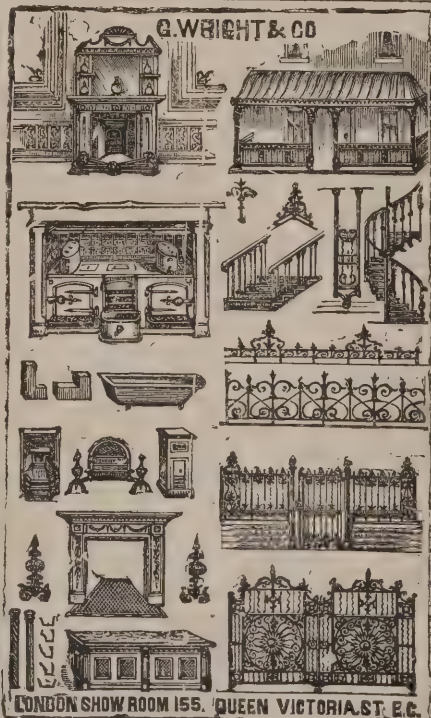
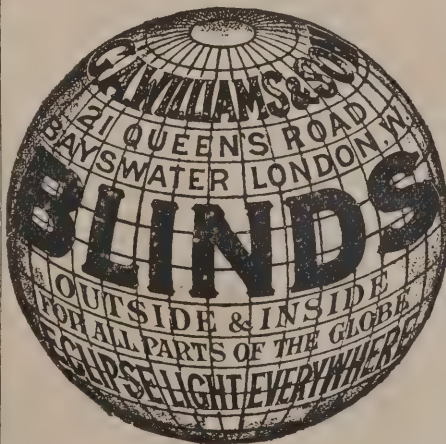
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sheets do not lie as well in consequence of the expansion and contraction of the metal. In the roll-cap system the section through a roll is somewhat of a wedge section, with the point of the wedge cut off; the clips that pass under the wood rolls are about 2 inches wide, and placed about 3 feet apart along the roll. The cap is secured by forked connections; these are pointed pieces of zinc 2 or 3 inches long by about an inch wide, one end of which is soldered to the inner surface of the cap on each side, the point being free; as the cap slides on to the roll the points of these forks slip in under the hooked portion of the clip. The stopped end of the roll cap on the upper level of the drip is bent over with the edge of the sheet. In gutters where the incline is very slight, and soldered joints are therefore necessary, an extra allowance of play should be provided for expansion and contraction by placing a sort of roll system across the gutter at its highest points. For gutters $1\frac{1}{2}$ to 2 inches drips should be allowed, except where it is necessary to put a roll in the centre, and in this case they must not be less than 2 inches. Wall flashings should go into the wall $1\frac{1}{2}$ inches; they are very similar to lead, and for strength to stiffen the edge and for appearance should be finished with a bead and pointed in cement; the edge of the sheet should be turned up about 6 inches against the wall. Valley gutters should have a fall of at least 3 inches in 10 feet. In laying zinc work, in almost all cases no solder, nails nor external fastenings are to be used, each sheet or portion of metal should be laid free and unconfined. The lower edges of the sheets nearest the eaves are strengthened where they project over the gutter by being doubled back so as to form a bead, and also by a strip of strong zinc nailed along the edge of the boarding over which the bead is turned. The ridge can be covered by a zinc roll cap turned over it; this cap is strengthened on the lower edges by their being bent round to form beads, and it is fixed with clips in the usual way.

The incline of zinc roofs constructed as before mentioned should be from, say, 20 deg. to 36 deg., whereas for slates or tiles it is from, say, 32 deg. to 45 deg., consequently this system of roofing requires lighter framing and less brickwork in the height of chimneys and gables, &c., and there is also less surface to cover, owing to the lower pitch of roof. Zinc roofs have also zinc gutters and flashings, and the extra cost of such leadwork in ordinary roofs is thus also saved. In cases of greater or less pitch than 20 deg. to 36 deg., it is better, the Vielle Montagne Company say, to adopt the patent roll-cap system; this is similar to the ordinary roll-cap construction,

excepting that there are differences in the shape of the wood roll, the roll cap and the clips.

The Vielle Montagne Company recommend their patent drawn roll cap for flats of warehouses, &c., where weights are stored or where there is much walking about, and for appearance in high-pitched roofs; in this system the loose roll cap is dispensed with, the zinc being drawn tight over the roll by machinery. The weight of a square of zinc roofing, roll-cap system, 13 gauge, is about 130 lbs., and 16 gauge 192 lbs.; corrugated work, 13 gauge, is about 136 lbs., and 16 gauge 198 lbs. When zinc is required to be laid, not upon boarding, it is strengthened by corrugations. Ordinary corrugated zinc has the flutes about $3\frac{1}{2}$ inches wide, and rests upon spars about 2 feet 6 inches apart. Zinc roofing thus constructed has the advantages of both strength and durability owing to the corrugation. I may perhaps also mention that the corrugation in itself in great measure overcomes the difficulty of expansion and contraction—at any rate, this is the case across the sheets or corrugations. It can be easily laid upon a light framework of wood or iron; it is unnecessary to have boarding. The minimum incline of these roofs should be about 22 deg., the lap in the width of the sheets should be from $3\frac{1}{2}$ to 4 inches. The sheets should not be rivetted together; they can be sufficiently fixed with clips, that is to say, three slips of zinc are soldered to the underside of each sheet, and these hook on to similar hooks fixed to the wood framing, or they can hook on to iron purlins. The corrugations are of three sizes, $2\frac{3}{8}$ inches, 3 inches, and $3\frac{7}{8}$ inches c to c. Patent corrugated zinc, with flat spaces between the corrugations, is another form of corrugation often preferred. Double-ribbed zinc roofing may be laid on boarding or on laths or battens.

The double ribs give extra rigidity to the sheets. The tops of the sheets are nailed to the woodwork under the overlap of the sheets above them, and the upper sheets are fixed with a fork connection on the inner face of the ribs. The length of the lap varies, according to the incline of the roof, from $2\frac{1}{2}$ inches to 6 inches; the smaller the inclination, of course the longer is the lap, to avoid capillary attraction. Corrugated zinc may be laid like corrugated iron, with the flutes horizontal, so that the sheets will span wider spaces between principals without any intervening rafters or purlins. In such a case, however, the flutes must be of a peculiar angular stepped form. In Italian corrugated zinc roofing the corrugations are 1 foot 3 inches c to c. A great advantage is that it may be laid without boarding upon rafters spaced and

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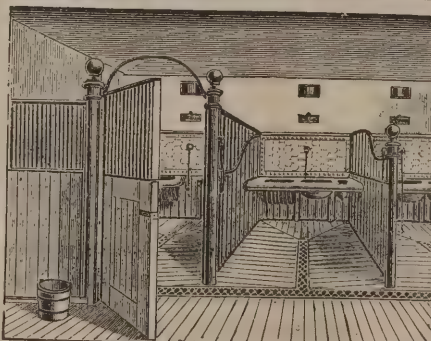
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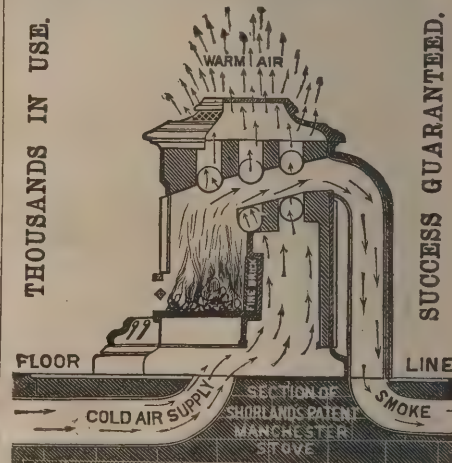
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shaped to fit into the corrugations; or it may be laid on boarding. The sheets are secured to the rafters by patent holding-down clips. The lap of the upper sheets over those below them should be about 5 inches. The rafters rest upon purlins which, in large roofs (owing to the lightness of this system), may be 10 feet apart; the depth of the rafters or rolls should be about 3 inches when resting upon purlins 7 feet apart, but when laid upon boarding, 2 inches deep is enough. The wood rafter can be any depth and width, but 3 inches by $1\frac{3}{4}$ inches is large enough; if the rafters are wider, then the upper part, to a depth of $1\frac{1}{4}$ inches, must be worked to receive the corrugations of the metal. The ridge roll is covered with zinc nearly in the same manner as with lead, except that the zinc is not worked so much into the angles under the roll, and it is secured on the under-side by forks. Valley gutters are also formed in somewhat the same manner as with lead. For roofs laid with wood rolls the wooden trough is lined with sheet zinc, the sides of which are turned up and the upper edges bent inwards under the bead formed by the lower edge of the sheet at the eaves. Where Italian corrugated zinc is used, the sides of the zinc lining to the gutters are turned up and the edges bent over the thickness of the wood sides of the trough; the minimum fall of such gutters should be $\frac{1}{4}$ deg. The following is the approximate weight when laid, including corrugations and laps, for 100 super feet:—Square roll cap, 14 gauge, 144 lbs.; Italian corrugation, 150 lbs.; square roll cap, 16 gauge, 192 lbs.; Italian corrugation, 198 lbs.

In the zinc tile system the tiles are generally fixed on boarding with clips or hooks, and are well adapted for high-pitched roofs. They can be fixed with ease, even by unskilled men. Each tile is hung from a hook fixed upon battens or boarding, and passing through a hole near the top of the tile. The ordinary size of square tiles are $10\frac{1}{2}$ inches, $13\frac{1}{2}$ inches and 17 inches square, and for large buildings they are $23\frac{1}{4}$ inches or 29 inches square; 13 gauge is enough for the smaller tiles, but the larger ones should be 14 or 15 gauge. There are other forms of zinc tiles, such as diamond-shape, ribbed, stamped, scale-pattern, &c., all fixed with clips in slightly different ways. The Vielle Montagne Company suggest, in their publications, that zinc in tiles or sheets may be used for covering and preventing dampness in walls. Zinc eaves gutters are hardly strong enough to bear the weight of snow or even the pressure of a ladder; they require stays or hollow tubes of zinc placed across the top of the gutter about 18 inches apart, through which is fixed the screw fixing the gutter to the woodwork; the stay keeps the upper part

of the gutter from bending inwards as the screw is driven in. Among other purposes for which zinc is used I may mention the following:—Small spelter cakes are used for galvanic batteries, and larger cakes, weighing about 30 lbs. each, are prepared for the zinging or galvanising of iron articles; being very sonorous, it is suitable for speaking tubes, and is also used for tubes for bell wires, and as nosings to protect stair treads, for chimney-cowls, wires and baths; these do not rust like iron nor chip like enamel baths, and the water does not cool so rapidly as in other cases. It is safer not to use zinc for cisterns lest the water should perchance be such as would cause them to decay. Perforated zinc is made of endless pattern, and is suitable for ventilating purposes to dairies and other openings, for window blinds, and as a covering for hot water or steam pipes, and for various domestic and other purposes. Zinc nails for slating vary from 1 to 2 inches in length.

Laxton's "Price Book" for 1893 gives zinc slating nails at 6d. per lb. I may, perhaps, also give the following information as to measuring and prices:—Vielle Montagne zinc 15 gauge is 8d. per foot super, and is measured net over surfaces of flats and add for the necessary turning and laying. Zinc roll cap, $2\frac{1}{2}$ d. per foot run; bossed ends to ditto, $1\frac{1}{2}$ d. each; secret tacks or slips, 2d. each; bossed or soldered angles, under 4 inches high, 4d. each; 3-inch to 5-inch half round and ogee eaves guttering varies in price from 5d. to $8\frac{1}{2}$ d. per foot run; 2-inch to 4-inch round rain pipe is from 5d. to $8\frac{1}{2}$ d. per foot run; 3-inch to 4-inch octagon rain-water heads are 5s. 6d. to 6s. 6d. each; 3-inch and 4-inch shoes are 1s. 6d. and 2s. 4d. each. The average cost of zinc roofing with sheet zinc and drips is 55s. per 100 super feet.

Mr. Edmeston has stated that the roof of the London and North-Western Railway at Birmingham (area 108,696 feet), covered with galvanised iron, cost 3,600l. to paint in twelve years to prevent decay, and the cost to cover this area with zinc would not exceed 3,397l. This has now been since covered by degrees with zinc and no longer requires painting. I may mention that paint does not readily adhere to sheet zinc unless it is first washed with one or other of the necessary solutions, or a thin coat of liquid size will make any oil colour adhere to zinc should this be required for any purpose.

Galvanised iron being composed of two metals which are subject to different laws as to expansion and contraction is therefore liable to have its coating crack; it is also apt to have it decay and unless frequently painted it splits off in time. Pure and solid zinc, however, remains sound and is in great

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measure preserved from further decay by the coating of oxide which forms upon it, and when once properly laid requires much less repair than other roofs do. It is, perhaps, hardly a matter for architects to consider much, but it is maintained that zinc when taken off roofs, &c. equals 40 per cent. of the original value, whereas galvanised iron when stripped off is of much less value.

Zinc forms a component part of several useful alloys, and the oxide of the metal is used as a basis for zinc paint. I shall, however, suggest and leave zinc paint as a subject for some other gentleman to volunteer to take up at a future lecture. Almost all the metals combine with zinc, and some of its alloys are of great importance. English brass is one part of zinc to one of copper. Dutch is one to two. The "Encyclopædia Britannica" says two atoms of zinc to one of copper is best. Muntz's yellow metal of Birmingham, used as sheets for sheathing, contains 40 per cent. of zinc to 60 of best copper. Bronze is composed of copper, zinc and tin, of which vessels have been found at Nineveh and Herculaneum. In 1844 some building sheds in Portsmouth Dockyard were first covered with zinc, since which time its use has become more general in this country. The sales of the Vielle Montagne Company of zinc for roofing purposes alone in the United Kingdom increased from 880 tons in 1867 to 3,500 tons in 1881. I may mention that if architects use a reliable zinc, such as the Vielle Montagne, and have it laid by a reliable firm, such as Messrs. Braby, of Euston Road, London, they have nothing to fear. I shall, however, as supplementary to this advice, in conclusion just mention a few points as suitable for a specification for good work, selected in part from the last edition of Gwilt's "Encyclopædia." The roofs and flats are to be covered with No. 15 gauge malleable Vielle Montagne zinc fixed with holding-down clips, improved solid stopped ends and ridge plate; the zinc sheets to overlap each other 6 inches, and to have rolls 1½ inches wide. The zinc is to be turned up 5 inches all round against walls or skylights, and to be finished with flashings 6 inches wide inserted an inch into the joints of the brickwork, and secured by galvanised iron wall-hooks. Cesspools are to be formed at the head of the rain-water pipes and the zinc well lapped over. The whole to be laid with shotted fastenings lapped at angles. Gutters to be laid with 6-inch laps at drips, and to be turned up under slates for 11 inches. Finally I desire to state that there seems to be no book dealing with the subject I have brought before you to-night, and I am simply indebted to my

experience and memory in connection with the matter; also perhaps in part to a paper read before the Royal Institute of British Architects in 1860 by my former master, Deputy Alderman Edmeston, entitled, "An Examination of Existing Facts relating to Zinc Work on the Continent" (it is, however, about ten years since I myself read this pamphlet). I have also obtained scraps of information from various publications already I think mostly mentioned. I also thank Messrs. Braby and the local Vielle Montagne agents for information and for the use of samples and models, &c.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 5666. George Bayliss, jun., for "Improvements in the hanging and fitting of sliding sashes for windows."
- 5691. Henry Hoare, for "Improvements in door-lock protectors."
- 5724. Joseph Andrew Webber, Walter Henry Joseph Webber and Webber & Son, Limited, for "An improved surveying instrument."
- 5738. Alois Vogt, for "Improvements in door-checks."
- 5793. William Turner, for "Improvements in fireplaces and ranges."
- 5817. William Morton and Joseph Marshall, for "Improvements in fire-escapes."
- 5872. Thomas Jenks and Thomas Hook, for "An improvement in fittings for hanging and fixing casement windows."
- 5936. Ludwig August Beckmann, for "An improved smoke-suction protecting-cap for chimneys."
- 5959. Alfred Brown and Henry Clarke Puce, for "Improvements in locks and latches."
- 5961. Thomas Shurmer, for "Improvements in or relating to sliding windows."

To INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

GOOLE.—April 16.—Competitive Designs invited for a Covered Market, with Shops fronting Boothferry Road and Estcourt Terrace, with a Board-room, necessary Clerks', Surveyors', Inspectors', Collectors', Gas and Water and other Offices, with the Necessary Anterooms, Storerooms and Lavatories, to be Erected upon the Land and Premises, in Goole, abutting upon the before-mentioned Streets. Mr. George England, Local Board Offices, The Exchange, Goole.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

LONDONDERRY.—May 1.—Plans are invited for proposed Baths and Washhouses. Mr. Robert N. Chambers, Guildhall, Londonderry.

CONTRACTS OPEN.

ABERAMAN.—April 19.—For Additions to Board Schools. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

ACCRINGTON.—April 21.—For Alterations and Additions to Buildings for New Offices of the *Observer and Times*, Removal of Machinery, &c. Mr. Ross, Architect, Birch Street, Accrington.

BANGOR.—April 24.—For Building Vagrant Wards. Mr. R. Benjamin Evans, Guardians' Offices, Bangor.

BALROTHERY.—April 19.—For Building Labourers' Cottages. Mr. C. M. Tuite, Engineer, Dalmount Cottage, Drogheda.

BARNLEY.—April 17.—For Building Stable and Coach-house. Mr. Herbert Crawshaw, Architect, Regent Street, Barnley.

BIDEFORD.—April 23.—For Building Technical School. Mr. G. Malam Wilson, Architect, Bridge Buildings, Bideford.

BOLLINGTON.—April 30.—For Putting-down Borehole. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

BRADFORD.—April 16.—For Extension of Board School, &c., Undercliffe. Mr. E. P. Peterson, 10 Exchange, Bradford.

BRADFORD.—April 19.—For Building House and Shop and Two Through Houses. Mr. Fred. Moore, Architect, 40 Sun-bridge Road, Bradford.

BRISTOL.—April 18.—For Building Board Schools at Eastville. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BRISTOL.—April 19.—For Extension of Laundry, New Bathrooms, Lavatories, &c., at Workhouse, Stapleton. Messrs. Crisp & Oatley, Architects, 27 Clare Street, Bristol.

BURY.—April 24.—For Shuttles, Sluices, Gearing, &c., for New Reservoir. Mr. J. Cartwright, Engineer, Bank Street, Bury.

CANNING TOWN.—April 24.—For Construction of Band Stand. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

COLERAINE.—April 14.—For Building Wing to Academical Institution. Messrs. W. & M. Given, Architects, Diamond, Coleraine.

CORK.—April 19.—For Additions to Nuns' Residence at Workhouse. Mr. J. Cotter, Clerk to the Guardians.

COVENTRY.—April 18.—For Additions, &c., to Board School. Messrs. G. & I. Steane, Architects, 22 Little Park Street, Coventry.

CYMMER.—April 21.—For Construction of Passenger Station, &c. Mr. Yockney, Engineer, 46 Queen Anne's Gate, Westminster.

EARLSHEATON.—April 26.—For Building Weaving-Shed. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

ECCLESHALL.—April 23.—For Building Stores. Mr. James Hall, Architect, Paradise Square, Sheffield.

GOOLE.—April 14.—For Building Premises for the Goole Times Co. Mr. H. B. Thorp, Architect, Goole.

HALIFAX.—April 21.—For Rebuilding Saddle Inn. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

HATTON.—April 21.—For Additions to Asylums. Mr. E. Mansell, Architect, Imperial Chambers, Colmore Row, Birmingham.

HAY.—April 16.—For Building Vicarage at Llanigan. Mr. Stephen W. Williams, Architect, Rhayader, Radnorshire.

HEAPEY.—April 23.—For Construction of Waste Water Purification Works. Messrs. Lomax & Lomax, Engineers, 20 Grosvenor Chambers, Deansgate, Manchester.

HEATON NORRIS.—April 19.—For Additional Precipitation and Filter Tanks at Outfall Sewage Works. Mr. W. C. Sheard, Surveyor, Vestry Hall, Short Street, Heaton Norris.

HOLLACOMBE.—April 16.—For Construction of Brick Gas-holder Tank. Mr. R. Beynon, Gas Engineer, Vaughan Parade, Torquay.

KILLMARSH.—April 25.—For Building Business Premises. Messrs. Fisher & Son, Architects, 48 High Street, Eckington.

LLANITHEL.—April 13.—For Building Chapel and School. Mr. G. H. Daniel, Clarence Chambers, Pontypool.

LLANSAMLET.—April 17.—For Building Board School. Mr. Rees Llewellyn, Architect, Birchgrove House, Llansamlet.

MANCHESTER.—April 16.—For Building Workshops, Stores, &c. Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester.

MERTHYR DOVAN.—April 21.—For Additions to Colcot Arms. Mr. George Thomas, Architect, Queen's Chambers, Cardiff.

NORTH SHIELDS.—April 13.—For Construction of Timber Jetty. Mr. J. F. Smillie, Borough Surveyor.

PORTSMOUTH.—April 17.—For Additions to Board School. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

PUDSEY.—April 14.—For Building Four Terrace Houses. Mr. Herbert Hodgson, Architect, 27 Kirkgate, Bradford.

RADNORSHIRE.—April 25.—For Construction of Aqueduct (10½ miles) from Dolan to Knighton. Mr. James Mansergh, Engineer, 5 Victoria Street, Westminster.

RAMSGATE.—April 19.—For Building Harbour-Master's House, West Cliff, and Custom-House. Mr. Wm. A. Valon, Engineer, Ramsgate.

RAMSGATE.—April 19.—For the Erection of a Harbour-master's House at West Cliff. Mr. William A. Valon, Borough Engineer.

RAMSGATE.—April 19.—For the Erection of a Customs House. Mr. W. A. Valon, Borough Engineer.

READING.—May 1.—For Widening and Reconstructing Two Bridges, also New Bridge and Subway near Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

SHEFFIELD.—April 28.—For Building Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SHEFFIELD.—May 2.—For Construction of Public Baths. Mr. C. F. Wike, City Surveyor, Bower Spring, Sheffield.

SOUTHEND.—April 18.—For Construction of Underground Conveniences. Mr. C. T. Copley, Borough Surveyor.

SOUTHAMPTON.—April 14.—For Additions, &c., to Cowherds' Public-house. Mr. W. B. G. Bennett, Borough Surveyor.

SUNK ISLAND.—April 24.—For Reclamation Works. Mr. G. Bohm, Engineer, Imperial Chambers, Bowlalley Lane, Hull.

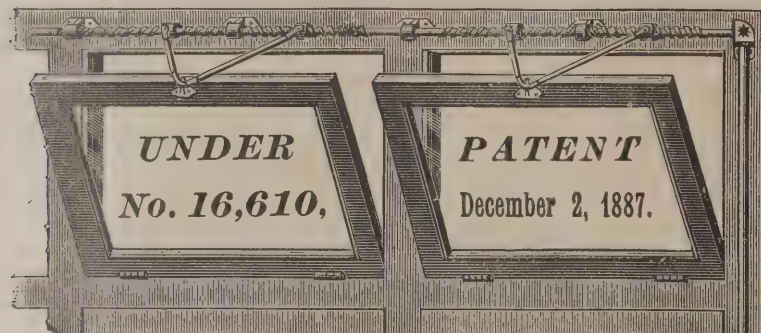
TREFOREST.—April 16.—For Additions, &c., to Board Schools. Mr. A. O. Evans, Architect, Town Hall Chambers, Pontypidd.

UPMINSTER.—April 19.—For Taking-down and Rebuilding Cockleburn Bridge. Mr. H. Gibson, Clerk to County Council, Chelmsford.

WESTON-SUPER-MARE.—April 19.—For Extension of Convalescent Home. Mr. H. Lawford Jones, Secretary, Clifton Road, Weston-super-Mare.

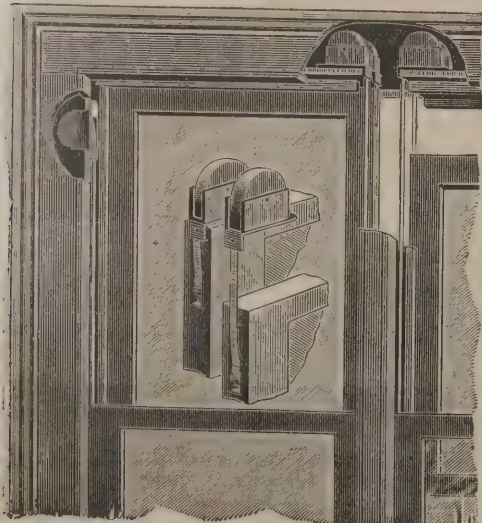
WILLINGTON.—April 17.—For Taking Down and Rebuilding the Pit Laddie Hotel. Mr. W. Cook, Architect, 59 Saddler Street, Durham.

WE hear that Messrs. Perken, Son & Rayment ("Optimus"), of Hatton Garden, London, had the opportunity of displaying their new safety saturator for optical lantern illumination at the meeting of the Royal Institution of Great Britain in Albemarle Street, Piccadilly. The instrument was shown in a bi-unial lantern, one saturator supplying the two jets. The light was switched off and on from the upper to the lower lantern and *vice versa* with great rapidity. Several members of the company present themselves manipulated the instrument, and expressed their great satisfaction at the simplicity and perfect success of the dissolving arrangement. By way of experiment, one or two gentlemen tried to snap out the light, but were gratified to find it quite impossible so to do. The room was illuminated by brilliant electric lights during the time these experiments were conducted, still the transparent photographs projected on the screen were well illuminated and much appreciated.



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F. Beale, Andover £127 15 0
ANNETT & SON, Andover (accepted) 95 0 0

BANSTEAD.

For Erecting a Band-Room at the Kensington and Chelsea Schools, Banstead, Surrey, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.
W. J. Wells, Kingswood £1,086 0 0
Leslie & Co., Kensington 962 0 0
R. Peters, Banstead 890 0 0
J. B. Potter, Sutton 850 0 0
England & Gale, Bow 815 0 0
Huntley Bros., Croydon 749 0 0
J. W. TRAPPITT, Baddington (accepted) 714 0 0

BEDLINGTON.

For Building Four-roomed House, Hirst Terrace, Bedlington. Accepted Tenders.
G. T. Gordon, Morpeth, builder £173 7 0
T. Dodds, Bedlington, joiner 82 15 0
P. Dickinson, Bedlington, painter 12 2 6

BIRMINGHAM.

For Additions to St. James's Schools, Handsworth, Birmingham. Mr. JOHN ROBERT NICHOLS, M.S.A., Architect, Birmingham. Quantities by Mr. FRANCIS BRISTOW, Surveyor, Birmingham.
C. A. Horton, Brierley Hill £389 0 0
J. Archer, Handsworth 379 0 0
W. T. Bennett, Handsworth 368 0 0
J. Webb, Handsworth 365 0 0
G. Squires, Aston 350 0 0
G. Trentham, Handsworth 346 0 0
Walton Bros., Smethwick 344 0 0
J. Dallow, Blackheath 340 0 0
J. Light, Langley 336 0 0
Lidgey & Evans, Birmingham 332 0 0
W. H. Hancox, Smethwick 329 0 0
H. Dorset & Co., Cradley Heath 320 0 0
G. WEBB, Handsworth (accepted) 281 15 0

BOURNEMOUTH.

For Extension of Roads and Sewers, Branksome Tower Estate. Messrs. H. E. HAWKER & MITCHELL, Bournemouth, Surveyors to Estate.

White	£2,905	0	0
Brixey	2,434	0	0
Stickland	2,063	0	0
Troke	1,996	0	0
Playfair & Too'e	1,861	0	0
Saunders	1,767	0	0
Budden	1,760	0	0
Hoare	1,540	0	0
W. SAUNDERS & Co. (accepted)	1,253	0	0

For Building Stables, Colebrook Grange. Messrs. H. E. HAWKER & MITCHELL, Architects, Bournemouth.

F. Hoare & Son	£775	0	0
George & Harding	750	0	0
Jenkins & Son	689	0	0
W. HOARE (accepted)	670	0	0

For Building House, Branksome Park Estate. Messrs. H. E. HAWKER & MITCHELL, Architects, Bournemouth.

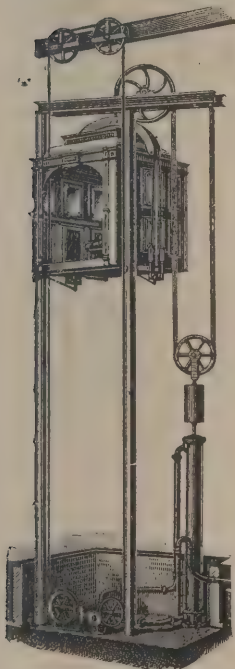
F. Hoare & Son	£1,392	0	0
George & Harding	1,385	0	0
Entwistle & Cox	1,320	0	0
Jones & Son	1,275	0	0
W. Hoare	1,255	0	0
JENKINS & SON (accepted)	1,247	0	0

For Building Branksome Junction Hotel. Messrs. H. E. HAWKER & MITCHELL, Architects, Bournemouth.
W. JONES & SON (accepted), per Schedule.

BRADFORD.

For Construction of 140 Yards of Road and 298 Yards of Main Sewer at Tong Street, Dudley Hill. Messrs. SMITH, GOTTHARDT & CO., Surveyors, 15 Cheapside, Bradford.

R. Parish, Pudsey	£369	4	8
M. Hall, Bradford	305	19	6
W. Barrand, Bradford	300	0	0
R. Parker, Bradford	288	8	10
T. Clough & Son, Heaton	280	12	4
J. & W. Pollard, Dudley Hill	280	1	0
R. NAYLOR & SON, Cleckheaton (accepted)	269	0	0

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Durban Town Hall, S.A.	Windermere Church
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GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.	
SILVER MEDAL—PARIS, 1889.	

BRADFORD—continued.

For Building House and Shop and Thirteen Houses, Marshfield Place, Manchester Road. Mr. ABRAHAM SHARP, Architect, Albany Buildings, Market Street, Bradford.

Accepted Tenders.

F. Woodcock, Low Moor, plumber and glazier.
J. & W. Bates, West Bowling, plasterer and concreter.
S. Slater, Low Moor, slater.
J. C. Calvert, Lister Hills, painter.

BIRKENHEAD.

For Building Boundary Wall, with Gates and Retaining Wall to Inclined Roadway at the South End Refuse Destructor Site, New Chester Road, for the Corporation. Mr. CHARLES BROWNRIDGE, Borough Surveyor.
MANLOVE, ALLIOTT & Co., Limited, Nottingham (accepted). £819 15 4

BISHOP STORTFORD.

For Construction of Swimming Bath, Bishop Stortford, for the East of England Nonconformist School Co., Limited. Messrs. JOHN SLATER, 46 Berners Street, W., and H. G. IBBERTSON, 5 Adelaide Place, E.C., Joint Architects.

T. B. Pitcher	£2,364	0	0
C. North	2,313	10	0
J. H. Staines	2,237	5	0
C. Ansell	2,185	0	0
T. Fuller	2,075	0	0
E. West	2,070	0	0
J. P. White	2,063	10	0
Bell & Sons	2,016	0	0
A. Brown	1,998	0	0
H. Champness	1,979	9	6
J. L. Glassock & Son	1,932	0	0

BUTTEVANT.

For Building Shop and Residence, Buttevant. Mr. ARTHUR HILL, B.E., Architect, 22 George Street, Cork.

D. Credon, Fermoy	£878	0	0
D. Callaghan, Cork	825	0	0
T. O'Mahony, Fermoy	823	0	0
T. A. Walsh, Kilmallock	779	0	0
D. Duggan, Cork	775	0	0
E. Thornton, Kanturk	748	15	0
D. HAYES, Fermoy (accepted)	712	14	0

CAERPHILLY.

For Building Twelve Cottages, Caerphilly, for Caerphilly Building Clubs. Mr. JOHN H. PHILLIPS, Architect, St. John's Chase, Cardiff.

E. C. Newby & Co., Cardiff	£2,802	0	0
Benjamin Evans, Cardiff	2,100	0	0
Robert Owen, Aberdare Junction	1,975	0	0
Wm. Davies, Pontypridd	1,944	0	0
Isaac Williams, Caerphilly	1,939	4	0
Williams & Thomas, Cardiff	1,980	0	0
Thomas Rossiter, Caerphilly	1,920	0	0
F. Small, Barry	1,872	0	0
WM. MORGAN, Caerphilly (accepted)	1,860	0	0
Thomas Rees, Merthyr Vale	1,824	0	0

CARDIFF.

For Construction of Brick Sewer Ventilating-Shaft, 40 feet high, Cranbrook Street, for the Corporation. Mr. W. HARPUR, Borough Engineer.

T. Rees, Cardiff	£186	10	6
Evans & Jones, Cardiff	170	18	6
E. J. Ince, Cardiff	145	14	2
Wood & Sons, Cardiff	142	15	11
E. Page, Cardiff	110	9	2
W. Thomas & Co., Cardiff	107	2	3
Knox & Wells, Cardiff	103	0	0
Cad, Wallader, & Hockbridge, Cardiff	102	15	11
ELLIS & DAVIES, Cardiff (accepted)	98	7	0

DARNALL.

For Building Dwelling-house, Offices, &c., at Darnall, for the Waverley Colliery Company. Mr. E. WINDER, jun., Architect, Wharf Street, Sheffield.

J. Fidler, Eckington	£655	0	0
J. Holmes, Sheffield	621	0	0
F. Foers, Treeton	616	15	4
H. Sykes, Beighton	608	17	0
Stow & Aplan, Sheffield	591	5	6
J. Edmondson, Sheffield	582	4	0
J. Ethelby, Sheffield	560	0	0
C. Chadwick, Sheffield	546	0	0
C. Green, Rotherham	537	18	0
PINDER BROS., Sheffield (accepted)	529	10	0

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M. Batchelor	484	0	0
VIGOR & Co., London (accepted)	437	0	0

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J. H. Crabtree, Halifax, plumber	77	11	0
J. Berry, Halifax, ironfounder	74	0	0
J. Bancroft & Son, Halifax, slater	61	7	0
J. Bancroft & Son, Halifax, plasterer	35	5	0
J. Whittaker, Queensbury, painter	19	4	6

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W. Nicholson & Son, joiner	1,073	9	11
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J. Atkinson & Sons, slater	205	0	0
Hargreaves & Dewhurst, ironfounder	204	13	0
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H. Braithwaite & Co., patent glazier	68	10	0
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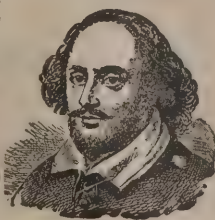
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Surveyor's estimate 265 9 0

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Nadin 123 0 0

Holmes & Co. . . . 109 0 0

Eyre 106 5 3

Ramsden 101 7 6

Yeadon 96 8 10

Whitaker 94 0 0

Watkin 94 0 0

Morton 87 10 2

HILL (accepted) 85 5 3

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Ramsden 200 1 9

Yeadon 196 18 10

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S. & W. Pattinson	15,520	0	0
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R. & E. Evans	13,490	0	0
J. Pocock (<i>withdrawn</i>)	10,974	0	0

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Tucker, Reading	£1,151	0	0
Reavell, Windsor	1,075	0	0
BAMPFYLDE, Windsor (<i>accepted</i>)	1,056	0	0

AFTER fifteen years of service with the London and Lancashire Fire Insurance Company, Mr. W. P. Reynolds, the London secretary, has decided to retire, and the directors have accorded him a liberal pension. Mr. Reynolds's successor will be Mr. Joseph Powell, of Liverpool. Mr. Powell commenced his insurance experience with the Imperial, and has been for the past ten years Liverpool secretary to the Scottish Union and National. He has also during the past two years held the office of chairman to the Liverpool Fire Salvage Association. We understand that this change will take place as from May 1 next, and the title accorded to Mr. Powell being that of London manager, Mr. J. P. Read, hitherto assistant secretary, will now become London secretary.

TRADE NOTES.

THIS secluded hamlet, Eryholme, Croft, near Darlington, which is about three miles from Croft, the nearest railway station, North Yorkshire, has had a valuable present in the shape of a public clock, striking the hours and showing the time upon one external dial, fixed at the Mission School, which will be a benefit to everyone in the district, the necessary funds having been got by Mrs. Stewart, the wife of the vicar of the parish, and Miss Scurfield, of Hurworth-upon-Tees. The makers are Messrs. Wm Potts & Sons, clock manufacturers, of Guildford Street, Leeds, the makers of the Richmond, Catterick and Hurworth Church clocks, and many others in the neighbourhood.

THE Clayton Hospital, Wakefield, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE designs and estimate of Mr. Louis Harper, engineer, Aberdeen, have been accepted for the supply of three ornamental steel-rope suspension footbridges, to be erected across a stream in the Duke of York Public Gardens, Grimsby.

At the meeting of the Badenoch district committee of Inverness County Council, held in Kingussie yesterday—Mr. D. Grant, solicitor, Grantown, presiding—tenders for the erection of a new iron bridge over the Spey at Kingussie, to replace the present timber structure, were opened and considered. There were thirteen offers from leading firms in Scotland and England. The probable estimate for the work was 3,500l., and the average of the tenders came to within a few pounds of that amount. After a long discussion it was decided to delay accepting offers until next meeting, when the surveyor would submit plans and estimates for a timber and iron bridge on an entirely new site, a feeling having been expressed in favour of altering the site so as to save an outlay of several hundred pounds in constructing a long timber footbridge on the north approach, so as to make the roadway, which in flood time is frequently impassable, available at all times.

UNDER date of February 21, 1894, Mr. John Tann, 11 Newgate Street, E.C., has received the following letter from Messrs. Fred. Anthony Horle & Co.:—"We had the burglars at our offices last Friday night, and they left a letter (now in the hands of the police), saying that they tried to open our safe (your 'Anchor Reliance') for three hours, but could not do it."

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WE hear that Messrs. Ham, Baker & Co., of 13 Grosvenor Road, Westminster, London, S.W., have been appointed sole agents for Ruscoe's patent apparatus for drilling and tapping mains under pressure and inserting ferrule without shutting off or wasting water.

WE have received from Messrs. J. Weeks & Co., of King's Road, S.W., a copy of a long list of valuable testimonials they have received from all directions, praising their patent duplex upright tubular boilers for horticultural purposes.

VARIETIES.

A BAZAAR in aid of the building fund of the new Bromsgrove School of Art, about to be erected on a site in the New Road, adjoining the new Institute, has just been held in the drill-hall. The bazaar was picturesquely arranged in seven half-timbered and straw-thatched cottages, representing an ancient Worcestershire village, and bearing the titles of "Ye Mermaydes," "Ye Gate Hangs Well," "Ye Beehive," "Ye Hare and Tortoise," "Ye Fighting Cocks," "Ye Pig and Whistle" and "Ye Olde Raven" on appropriately-painted signs. The buildings were erected mainly by the pupils of the carpentry class connected with the schools, under the direction of Mr. Turton, the teacher.

THE Mersey Dock Board have confirmed a recommendation of the warehouse committee that an additional pipeline be provided from the Herculeum Dock quay to the new petroleum tank proposed to be erected on the Parkhill Estate, at an estimated cost of 800*l*.

THE Wilmslow Local Board have received a notice from the Local Government Board sanctioning the proposal to borrow the sum of 10,000*l*. for the purposes of sewerage works and outlet in the northern district of Wilmslow as soon as the necessary land has been secured.

THE Scrabster Harbour Trustees have resolved to introduce a water supply to their harbour, at an estimated cost of 1,000*l*., plans for which have been prepared by Mr. Gordon, engineer, Elgin.

THE *Scotsman* says:—Workmen on the farm of Duns Law, Duns, have laid bare an ancient British tomb on the summit of a knoll known as the "Little Law" field. It is of oblong form, with its head to the north-west. The coffin, as well as its massive lid, is composed of old red sandstone, and its

interior measures in length on the north side 45 inches by 43 inches on the south side, and breadth 29 inches at the head by 23 inches at the foot. The depth is about 20 inches. The joints had been carefully filled in with puddled clay.

THE *Manchester Guardian* says:—The proposal to construct a line of railway from Acre and Haifa, on the Mediterranean coast of Syria, to Damascus is of much interest to Lancashire. The bulk of the present import trade now enters Syria through Beyrout, where the harbour tolls are onerous and landing charges excessive, as well as unequal, as French goods enjoy there an advantage in these particulars. The goods so imported to Syria all find their way to Damascus, the great collecting and distributing centre, and, having to be taken at present over two mountain ranges, the carriage is both slow and costly. The proposed railway will not only carry imports more expeditiously and at a much cheaper rate to Damascus, but will also do much to develop the intervening country through which, for a distance of 150 miles, its trains will run.

THE annual general meeting of the London and Lancashire Fire Insurance Company will be held at noon on April 26, at the Law Association Rooms, Cook Street, Liverpool.

THE Norton Local Board propose purchasing Ivy House, and fitting it up to serve as public offices.

Bric à Brac says a pretty souvenir of the penny postage jubilee has been issued by Mr. J. W. Palmer, in the shape of a photograph of the post-offices of the year 1790 and as they will be in 1990, as they were represented at the conversazione at South Kensington Museum on July 2, 1890. The photograph measures 6 inches by 4½, and is mounted on a thick cardboard. A portrait of Mr. Palmer is given in the picture, which is published at the price of one shilling.

THE sum of 1,000*l*. has been placed by the Goldsmiths' Company at the disposal of the governing body of the Imperial Institute, for fitting up and equipping its department of scientific and practical research, which is to deal with the investigation and practical valuation of new and little-known natural products received from India and from the colonies comprising the empire.

THE *Standard* says:—The will dated 1885, but executed in 1887, of Mr. Ford Madox Brown, late of St. Edmund's Terrace, Regent's Park, formerly of Victoria Park, Manchester, artist, who died on October 6, 1893, aged seventy-two years, has been proved, with personality under 1,000*l*.

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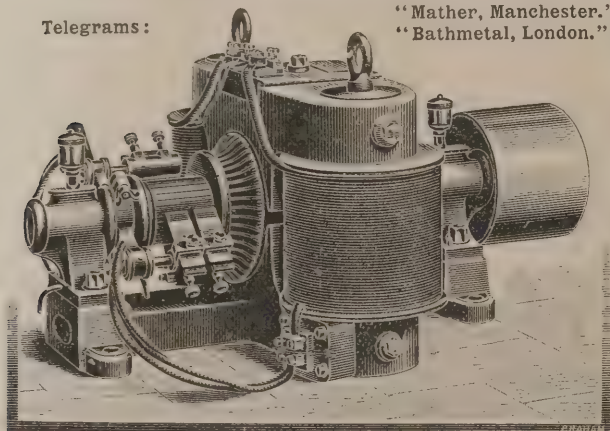
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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ELECTRICAL.

THE Folkestone Corporation have approved of a scheme for the installation of electric light at a cost of 35,000*l*.

THE following are the contractors for the supply of cables in connection with the Edinburgh Corporation's electric-lighting scheme:—Unarmoured cable, Henley's Telegraph Works Company, Limited; arc lighting cable, Indiarubber Works Company, Silvertown; armoured cable, Siemens Brothers. Mr. Monkhouse is the resident engineer.

THE Isle of Man Tramways and Electric Power Company, Limited, issue a prospectus wherein they ask for capital to the amount of 175,000*l*. for the purpose of extending the present Douglas Bay Tramway to Groudle Glen and to Laxey, with electricity as the motive power. The electrical plant machinery has been constructed and placed in position.

THE death is announced of M. Paul Jablochhoff, the Russian electrician and the inventor of the Jablochhoff candle. The deceased, who was an officer in the Russian army, was the first to solve the problem of dividing the electric light in a satisfactory manner. His system of electric lighting has been used in several cities of Europe.

BUILDING AND BUILDERS.

IT is proposed to build baths for Burslem, and Mr. F. Bettany, borough engineer of Burslem, has paid a visit to Bootle to inspect the public baths there, with a view to making the baths at Burslem as perfect as possible.

A LANDSLIP has occurred at Warden Point, Isle of Sheppey, a strip of cultivated land falling down the cliffs into the sea. A considerable quantity of land is lost annually in Sheppey through landslips.

AT the meeting of the Darlington Town Council the report of the technical instruction committee, which proposed to build a technical institute at the cost of 13,685*l*., including furnishing and land, the building itself taking 9,200*l*. of this amount, was adopted.

AT the meeting of the Leeds City Council it was decided that 2,280*l*. be granted to the markets committee for the roofing over in wood and glass of five alleys in the Kirkgate Open Market.

WORKMEN'S DWELLINGS IN CHESTER.

A REPORT has been issued to members of the Chester Town Council by the public health committee in reference to housing of the working classes in the city. The committee have not recommended the adoption of part three of the housing of the Working Classes Act, 1890, because the necessity for so doing, they say, has not been made apparent. The part of the Act in question they view as an enabling power to be exercised with extreme prudence and caution, and only in the event of clear proof of need, and that private and commercial enterprise are not likely to supply it. They have no reason to consider such conditions prevail. They are of opinion that the supply will meet the demand, and they hold it should be a cardinal principle in administering money drawn from rates that it should not be applied in competition with those who pay the rates—except in cases of absolute need, and its being manifest that the accommodation was not, and would not be, otherwise provided; nothing in the opinion of the committee would justify a corporation taking a course calculated to deter building enterprise, and to bring down the values and rents of their ratepayers' properties, by means of rates drawn largely from them. It rather seemed to the committee to be the duty of the Corporation to stimulate and facilitate by all the means in their power the providing of any needed accommodation by builders, investors and property owners. This had been done. As recently as last February, two large houses having been made into one, and adapted by the owners at a considerable cost, were licensed as a lodging-house for 67 persons. Though it be true that, through the action of the committee, for several years past, in reference to insanitary dwellings, principally in courts and entries, a number of such dwellings had been closed, it was equally true that a considerable number of cottages, fulfilling modern sanitary conditions, had been erected within the municipal boundary, while a greater number had been provided within the Parliamentary boundary and in the immediate suburbs, all of which were within easy reach, and were perhaps in many respects preferable to lodging-houses or cottages in the more densely populated municipal borough. The procedure under this part of the Act involved satisfying the Local Government Board, after holding a public inquiry; and it was provided that any person who, or whose wife or husband, while tenant or occupier of any municipal lodging-house, or part thereof, received poor-law relief, other than relief granted on account only of accident or temporary illness, should be turned out.

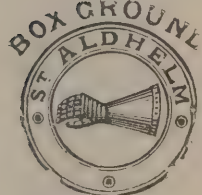
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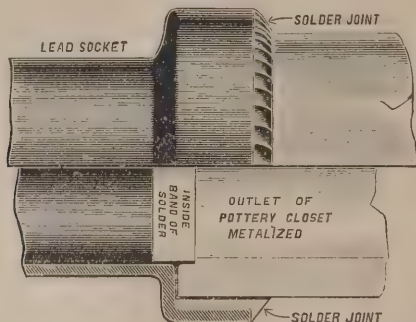
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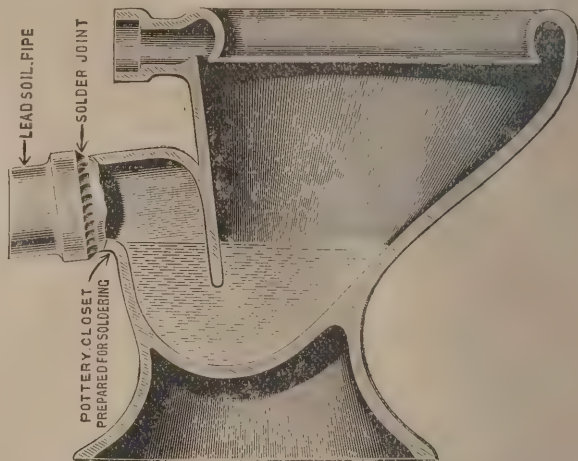
THE "METALLO-KERAMIC" JOINT.

A PERFECT joint to connect earthenware closets to metal pipes has long been needed. Subject to correction, we believe that several have studied how this could be accomplished, but without succeeding. Messrs. Doulton & Co., however, have solved this problem in the production of their patent "Metallo-Keramic" joint. We lately had an opportunity of inspecting the "Metallo-Keramic" joint at Messrs. Doulton & Co.'s show-rooms, Albert Embankment, Lambeth, and can safely say that their study and endeavours to produce a perfect joint has been crowned with success. To say that the invention is better than other methods of connecting metal and earthenware would convey a wrong idea, for as far as memory serves us we have



not before seen any system that has been successful. Messrs. Doulton & Co. have given serious study to the subject of jointing closets of earthenware to metal pipes, a most important matter from a sanitary point of view, as well as from other points of view too obvious to require detailing. Some of the difficulties we may allude to by mentioning that

hitherto it has been the custom to bring up the pipe to the floor level, taft the lead over, and make the connection with red-lead putty or other bedding, screwing the closet down to the floor. While it is possible, with due care, to make a water-tight joint by this means, it is certain that carelessness or a settlement will involve an escape of sewer gas. Many methods have been resorted to to meet this difficulty, and lead traps have been sometimes adopted, the joint to pottery being on the house side of the trap; but while this overcomes the difficulty of joint, it necessitates the use of a material (lead) which readily becomes coated, and it, moreover, involves an outer



boxed casing, to conceal the trap and the same objectionable joint between the pottery and lead. By the introduction of their patent "Metallo-Keramic" joint Messrs. Doulton have evidently overcome all these difficulties, and an absolutely perfect joint may be made between the outlet and ventilation connections of a pottery closet by an entire incorporation of the pottery and metal at the point of junction—an invention which completely gets over the serious difficulties before experienced. We can also add that most exhaustive tests of the joint have been made in its varying forms during a considerable period; and though only lately introduced, the "Metallo-Keramic" joint is already, we believe, being largely used. The merit of

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the invention may be shortly summed up by saying it is proof against the dangers and difficulties that beset previous methods and rendered them unreliable. The showrooms of Messrs. Doulton & Co. will repay inspection, and we took advantage of our visit to look over the excellent display of specialties and wares for which this firm is so well known. Messrs. Doulton & Co. are about to fit up the underground conveniences which are to be constructed in Islington, near the Philharmonic Theatre. This work when completed will evidently be second to none yet carried out in London, not only in good workmanship and handsome materials, but in meeting sanitary requirements even down to *minutiae*. A fine display of plumbing-work in the showrooms indicates the strides made of late years in this important branch of trade.

THE NEW RICHMOND WEIR.

THE new weir at Richmond is now just on the point of completion, and it is expected that some time in June there will be some sort of opening ceremonial. To speak of it as a "weir," says the *Daily News*, conveys only a very imperfect idea of the magnitude of the work, which has been estimated to cost from 60,000*l.* to 70,000*l.*, Richmond and Twickenham having contributed 40,000*l.*, and the balance having been found by the Thames Conservancy. It is in the main a weir of a very ingenious and novel character, though now in its completed form it has the appearance of a handsome iron and stone bridge of five spans. The essential feature of the structure is an elevated platform which runs across the river, and from which ponderous sluices can be lowered or raised. But the unavoidable ugliness of this platform with its sluices has been ingeniously masked by embodying it in a bridge with handsome iron parapets and fine archways.

Of these arches the two end ones have a span of 50 feet. One of these end arches is occupied by a lock 250 feet long and 37 feet wide, considerably the largest on the Thames. Under the other end arch is a boat pass with three sets of rollers. The three central spans are 60 feet wide, and are fitted with the ascending and descending sluices, ponderous structures of wood and iron, 68 feet long and each weighing 32 tons. So long as the river is above half tide these sluice gates will lie up horizontally under the platform, leaving below them an open river course and a clear headway of 21 feet above high-water mark. All the traffic of the Thames will thus be

able to navigate up and down just as under an ordinary bridge, and the lock and the boat pass will not be required. When, however, the current has run out to the point of half tide and the mud banks of the river bed are in danger of speedy exposure, the sluice gates lying horizontally up under the platform will be dropped, turning over into the perpendicular position as they will and plunging low enough into the ebbing tide to dam back the water to a minimum depth of 5 feet 9 inches below high water. The sluices will not go below the surface of the stream nor will they reach the river bed. They will sink low enough to keep the upper river at the required height, the superfluous water passing under them, thus keeping up that scour of the river bed the absence of which was for so many years urged as a reason why a weir at Richmond ought not to be permitted, since it would inevitably result in the silting up of the river. When these three central arches are blocked by the impassable weirs the lock and the boat pass of light craft will of course be brought into operation. Although the sluice gates are so large and ponderous, they will be raised and lowered with the greatest ease. These are counterpoised by weights, just after the manner of an ordinary window-sash, so that two men by means of winches can easily haul them up out of the water and stow them up overhead.

This new bridge has no carriage-way across it, the sluice-gates occupying that central portion of the structure which in an ordinary bridge would constitute the carriage-way. But on each side is a pathway for foot-passengers, reached by flights of steps leading up directly from the river banks. The new structure is quite level, and it rises abruptly from the banks, and is therefore wanting in that natural gracefulness of bridges the approaches of which rise gradually from the adjacent land on either side. This was unavoidable, but it undoubtedly detracts from the beauty of the new work, and it looks at present as though the red brick lock-house on each side will not greatly embellish the general whole. As these, however, are not yet finished, the effect cannot be positively pronounced upon, and now that the five arches are completed and the timbers cleared away the beauty of the main structure cannot be disputed, while the workmanship throughout is of the most solid and substantial character. With the exception of the lock-keepers' houses and a few feet of the lock walls the work is now practically complete, and there is no doubt all will be in readiness for the formal opening between this and midsummer. What the ceremony will be or by whom it will be performed are points upon which at present nothing has been decided.

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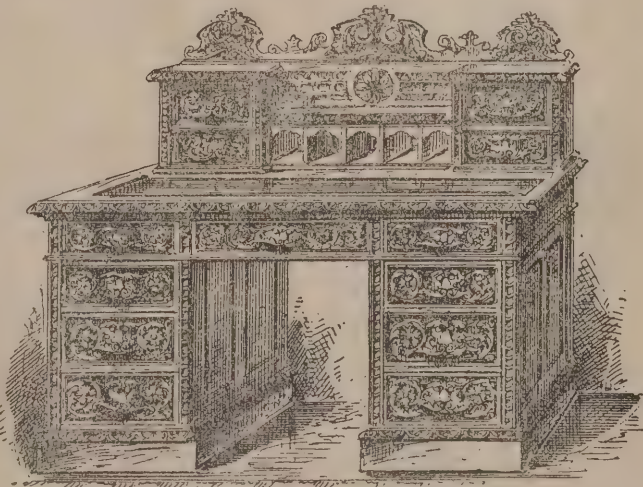
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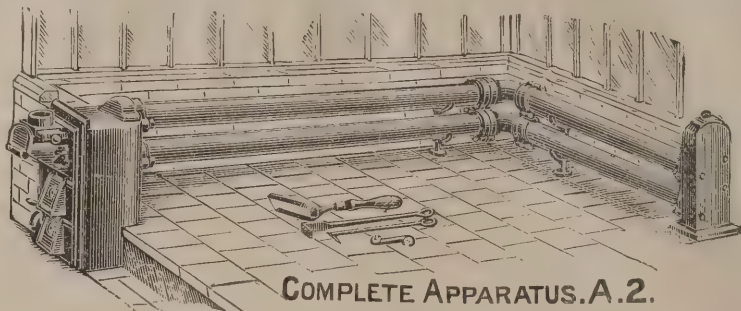
HEATING BY HOT WATER.*

A SECOND edition of this work has just been issued by Mr. Walter Jones (Jones & Attwood, Stourbridge), which, altogether independent of systems of heating, is well worth the perusal of architects and builders and, for that matter, of all among our readers, the public generally, who are interested in heating matters according to the best methods. In the second edition we find one hundred pages of new matter have been added; the tables have been revised and many useful ones introduced; several articles on high and low-pressure heating, radiators, duplicate boilers, hot-water supply and other matters are new, and these new articles have not been before published in any book on the subject, the author having been induced to do so by the many courteous applications he received to prepare a second edition. Certain specialties are described and illustrated but in subjection to

hours, and is thoroughly reliable. This may be regarded as a proof that this firm pay quite as much attention to small as large requirements, to be furnished at minimum cost with the maximum of efficiency. The little volume, however, should be consulted, as it gives information and suggestions on "the best methods of heating public, private and horticultural buildings," with many other details as to heating and boilers for all kinds of requirements, collected from all available quarters.

THE BROSELEY TILERIES COMPANY, LIMITED.

THE Broseley roofing tiles—of which the above-named company are manufacturers, and whose extensive works have been established over a century—are widely known, and hardness, lightness and fine appearance are aimed at in their manufacture. The same company are large manufacturers also of flooring and glazed tiles, samples of which we lately



the purposes of a monogram on hot-water heating, and the reader scarcely is called on to recognise the merits of the specialties of Messrs. Jones & Attwood, which are so modestly alluded to among those of many others. The little volume of over 200 pages has nearly 100 illustrations, accompanied by numerous tables. The annexed illustration shows the "Desideratum" complete apparatus, a most convenient form of apparatus for heating small greenhouses, coach-houses and other structures. The total height being only 20 to 24 inches, dispenses with the cost and inconvenience of a stoke-hole. It is economic in fuel, occupies a limited space, is low in price, has fuel space sufficient to last ten or twelve

inspected at their London office and showroom, 10 Arthur Street West, E.C. As far back as 1877 the company decided to develop their business in encaustic and geometrical flooring tiles, and with this object they enlarged their works, also laid down improved plant and machinery. Prior even to that they had gained a reputation for flooring tiles, which they had supplied to a number of public buildings as well as churches.

Owing to the increase in this branch of business, the company, to meet demands, erected last year new kilns and warehouses, also laid down additional machinery of the most modern type. They also commenced the manufacture of two specialties, viz. "Diamond" paving tiles (hydraulic), intermediate in price between ordinary quarries and tessellated flooring, and "Vitro-Granito," for tiling of walls and floors.

* Heating by Hot Water. Crosby Lockwood & Son.

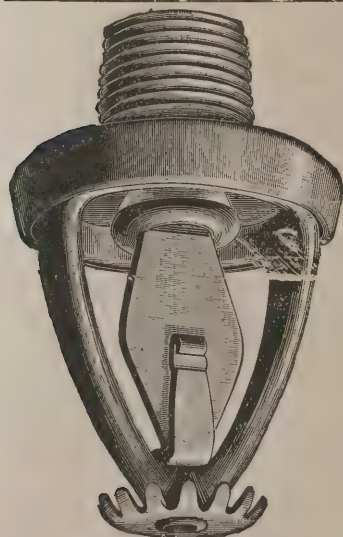
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"Vitro-granito" is a tile resembling granite for flooring or dado-work. It can be obtained in various combinations of colour and lends itself to effective treatment. The speckles, which curiously enough permeate the whole body of the tile, is a natural effect, and although protected by patent rights, the company questions if the tile could be produced outside their works, as mixed marl of this character is quite unique. We have recently inspected some dado-work done with this species of tile in the lavatories attached to the new offices at 14 Billiter Street, E.C., the body of the tile being exceptionally hard. The same description of tile (unglazed) for flooring-work has also been recently laid down at Kilburn.

ROUGH-CASTING IN CANADA.

ROUGH-CASTING, or as it is sometimes called, slap-dashing—both words of which are synonymous with the French *hourdage*, rough work, and *ravalement*, having a similar meaning, writes Mr. Fred. T. Hodgson in *Architecture and Building*—is a method of plastering the outside of buildings much used in the northern part of Canada, because of its being durable, cheap and well adapted to keep out cold winds during our long winters. The methods of applying rough-cast and the mixing thereof do not materially differ from the methods adopted in northern Europe or even in the North-Western States, but it is these minor differences, perhaps, that make the rough-casting done in Canada superior, so far as durability is concerned, to much that is done in other parts of the world.

There are frame cottages near the city of Toronto and along the northern shores of Lake Ontario that were plastered and rough-casted exteriorly over forty years ago, and the mortar to-day is as good and sound as when first put on, and it looks as though it was good for many years yet if the timbers of the building it preserves remain good. Rough-cast buildings are plentiful in every province in the Dominion from Halifax to

Vancouver and from Lake Erie to Hudson Bay, and when well built, and the rough-cast properly mixed and properly applied, the result is always satisfactory. It is quite a common occurrence in Manitoba and the North-west territories in the winter to find the mercury frozen, yet this intensity of frost does not seem to affect the rough-casting in the least, though it will chip bricks, contract and expand timber and render stone as brittle as glass in many cases, and the effect on iron and steel is such as may prove dangerous if exposed to sudden and unexpected strain.

In preparing a frame or log building for rough-casting, care must be taken in putting down the foundation. A good stone or brick foundation is, of course, the best, but where rough-casting is intended, stone or brick foundations are seldom used because of their cost, and the builder is compelled to use posts of wood. Here the posts are generally made of white cedar, which has a lasting quality of thirty-five or forty years, if sound when used. The posts are put in the ground from 3 to 5 feet, the deeper the better, as they should be deep enough in any case to prevent frost from forcing them upward. When a sufficient number of posts have been properly placed a line is struck on them the proper height from the ground and the tops levelled off. The sills are then placed—all joints being broken on top of posts—and the whole made level. These sills and all the other timber, scantlings and lumber should be well seasoned, if possible, for the greatest enemy to the plasterer is unseasoned timber; shrinkage of joists, posts and scantling not only breaks the bond of the mortar, but causes great cracks in corners and angles that no amount of pointing or patching can ever make good.

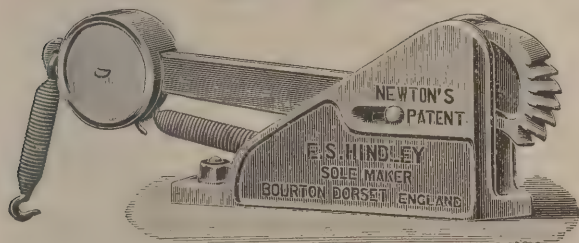
When the frame is up and the rafters on and well secured the whole of the outside should be covered with good, sound, common inch stock pine, hemlock, spruce or other suitable lumber, dressed to a thickness. If put on diagonally so much the better, but this is not absolutely necessary if the rough-casting is to be of the best quality, as will appear hereafter.

When it can be done it is best to get all partitions set in place and lathed, the roof on and all necessary outside finish or grounds put in place and made ready to receive the lath. The carpenter must prepare his finish or grounds for finish to accommodate the extra lath, as the walls will be thickened accordingly.

For the cheaper sort of rough-casting in one or two coats the following method of lathing is employed:—Nail laths on the boarding—over paper or felt, if paper or felt is used—per-

PATENT

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Patent Safety Grip for Cages of Lifts.
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pendicularly 16 inches from centre to centre if 4-foot laths are used, or 18 inches or 1 foot from centre to centre if 3 foot laths are used. The whole surface to be rough-casted will require lathing this way. When done lath as is ordinarily done with No. 1 pine lath, breaking joints every 15 inches. Put five nails in each lath, driving each nail home solid, coat over with mortar, well haired, and that has been made four or more days, smooth and straighten as well as possible with a darby. When done and while yet soft the rough-cast is thrown on it with such force as to drive the pebbles or small stones deep into it. The mixture or dash, as it is called, is composed of fine gravel, clean washed from all earthy particles and mixed with pure lime and water till the whole is of a semi-fluid consistency. This is mixed in a shallow tub or pail and is thrown upon the plastered wall with a wooden float about 5 or 6 inches long and as many wide, made of half-inch pine and fitted with a wooden handle. While with this tool the plasterer throws on the rough-cast with his right hand he holds in his left a common whitewash brush, which he dips into the rough-cast and then brushes over the mortar and rough-cast, which gives them when finished a regular uniform colour and appearance.

For this sort of work the following proportions will answer. To one barrel of prepared gravel use a quarter barrel of lime putty; mix well before using. This may be coloured to suit the taste by using the proper materials, as given further on. It must be understood that the foregoing is the cheapest sort of rough-casting, and is not recommended where more durable but more expensive work is required.

The best mode of doing this work, as practised in the lake district of Ontario, is about as follows:—Have the frame of building prepared as indicated in the foregoing, with partitions all put in and well braced throughout and well secured. Lath diagonally with No. 1 pine lath, keeping $1\frac{1}{2}$ inches space between the lath. Nail each lath with five nails, and break joints every 18 inches. Over this lath again diagonally in the opposite direction, keeping the same space between the lath and breaking joints as before. Careful and solid nailing is required for this layer of lathing, as the permanency of the work depends to some extent on this portion of it being honestly done. The mortar used for the first coat should have a good supply of cow's hair mixed in with it, and should be made at least four days before using. The operator must see to it that the mortar be well pressed into the key or interstices of the lathing to make it hold good. The face of the work

must be well scratched to form a key for the second coat, which must not be put on before the first or scratch coat is dry. The mortar for the second coat is made in the same way as that required for the first coat, and is applied in a similar manner, with the exception that the scratch coat must be well damped before the second coat is put on, in order to keep the second coat moist and soft until the dash or rough-cast is thrown on. The rough-casting is done exactly in the same manner as described for the cheaper sort of rough-cast work.

A building finished in this manner, if the work is well done, possesses many advantages over the ordinary wood-covered structure. It is much warmer, being almost air-tight so far as the walls are concerned. It is safer, as fire will not eat its way through work of that kind for a long time. It is cleaner, as it will not prove such a harbour for insects. It may be made as handsome as desired, for, before the rough-cast is dashed, it may be laid off in panels of any shape by having strips of battens tacked over the soft mortar, which may be removed after the rough-casting is done and the colouring finished. It is much superior to the so-called brick veneered house, as it is warmer, more exempt from fire and cheaper.

For 100 yards of rough casting in the manner described the following quantities will be required:—1,800 lath, 12 bushels of lime, $1\frac{1}{2}$ barrels best cowhair, $1\frac{3}{4}$ yards of sand, $\frac{3}{4}$ yard of prepared gravel and 16 pounds of hot cut lath nails, $1\frac{1}{4}$ inches long. The gravel should be sifted through a half-inch mesh screen, and should be washed before mixing with the lime putty.

To colour 100 yards in any of the tints named herewith use the following quantities of ingredients:—For a blue-black mix 5 lbs. of lamp-black in the dash. For buff use 5 lbs. of green copperas, to which add 1 lb. of fresh cow manure, strain all and mix well with the dash. A fine terra-cotta is made by using 15 lbs. of metallic oxide mixed with 5 lbs. of green copperas. A dark green colour is made by using 5 lbs. of green copperas and 4 lbs. of lamp-black. Many tints of these colours may be obtained by varying the quantities given. The colours obtained by these methods are permanent; they do not fade or change with time or atmospheric variations. Many other colours are used, but few stand like the ones named. A brick colour may be obtained by the use of Venetian red and umber mixed in whisky first and then poured into the dash until the proper tint is obtained. In time, however, like all earthy pigments, these colours fade and have a sickly appearance; they answer better in cements than when incorporated with fat limes.

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ITALIAN BUILDING SOCIETIES.

THE report drawn up by Mr. Geoffrey Drage on the Labour Question in Italy contains the following account of the co-operative societies for building, letting and selling dwelling-houses, which enable workmen to supply their own demand for cheap lodgings:—

The importance of sanitary questions is beginning to be recognised in Italy, and much has been done, especially in the great cities, to improve the construction, ventilation and lighting of dwelling-houses. Many old houses have been pulled down and replaced by larger and better buildings, but the conditions under which the poorer classes live are still far from satisfactory. When old and insanitary buildings are cleared away there is a tendency to fill up their places with larger mansions, which can be let for good rents to the richer citizens. The poor, driven from their former homes, crowd into the cheaper quarters of the town, which are already fully populated. The sudden increase in the demand for lodgings raises rents here also, and leads to overcrowding. Even where new houses are constructed with a special view to the requirements of artisans, they are often the work of speculators who build carelessly and in unhealthy situations, and demand exorbitant rents from their tenants.

Under these circumstances the institution of co-operative house-building societies promises to be a common benefit, justifying the stress laid upon this subject by the Congress of Cremona, 1892.

As yet, however, the movement is only in its infancy. In 1888 there were not more than 63 co-operative house-building societies in the whole of Italy, and by 1890 the number had only risen to 69, including 59 recognised and 10 unrecognised and autonomous associations.

The most common form of building society in Italy is that in which operatives or persons belonging to other classes, credit associations (especially savings banks and peoples' banks), benefit societies, or public companies (*amministrazioni*), combine to take up one or more shares in an association for building artisans' dwellings. Each member, whether an artisan or not, must take not less than one share, and not more than 100 or 200 shares, which are paid up by weekly or monthly instalments. As the capital thus collected would not suffice for the purposes of the society, the administrative council is empowered to contract loans, which are often granted on easy

terms by the local savings bank or peoples' bank. All the funds of the society must be employed in building houses, and as the houses are finished they must be either let to working members of the society or sold to them on a system of payment by instalments, by which the debt is paid off in a period varying from twenty to thirty years. The annual profits, after a certain portion has been placed in the reserve fund, are divided among the shareholders. The dividends on the shares are limited to the interest on the paid-up capital, and the profits of the business are so small that but few dividends are declared. The societies try rather to favour the operatives than the shareholders. They do their utmost to sell their houses at low prices, or let them at moderate rents. A distinctly philanthropic element enters into these associations, since they often receive free grants of land and pecuniary help from the communal authorities, and since also they admit members who do not derive any advantage from the society, but join it from purely disinterested motives. A typical example of this class of association is the building society founded at Milan in 1879 by the *Consolato operaio*, with the immediate object of buying or building a house for its own offices. This was effected in the same year by the purchase on credit of a house in the Via Pesce. A more extensive scheme for providing the working members with dwelling-houses was inaugurated by the purchase of a piece of ground in the Via Conservatorio. A loan of 50,000 lire was negotiated on favourable terms with the local peoples' bank, and twenty cottages were built, some with two and some with four rooms, and were at once let to artisan members of the society. In 1883, the society bought from the State more than 100,000 square metres of land at Porta Vittoria. For this building area it paid 270,120 lire, in thirty annual instalments, with a sliding scale of interest at the rate of 5 per cent. The house in the Via Pesce was sold and another was bought in the Via Crocifisso. To effect these various purchases a second loan of 100,000 lire at 4 per cent. was obtained from the peoples' bank. In a few months plans were prepared for building a model artisan quarter at Porta Vittoria, with cottages for single families, to be sold to members on a system of payment by instalments (*ammortamenti*), three-storeyed houses to be let in flats to the poorer members, gardens, public baths, and shops and warehouses for the co-operative stores. The rules of the society were relaxed in order to allow these houses and apartments to be let as well as sold, and also to admit public and private employés to a share in the benefits which were primarily

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intended for artisans only. Adverse circumstances prevented the scheme of 1883 from being carried out according to the original plans, which were, perhaps, rather too utopian in conception. The Peoples' Bank and the Savings Bank of Milan came to the assistance of the building society in its difficulties. The Peoples' Bank granted a loan of 300,000 lire at 3½ per cent. interest, which was spent in settling the most pressing debts, among them the debt to the State for the land on which the houses were built. The Savings Bank decided early in 1884 to expend a sum of 80,000 lire in buying shares in the society, and since the statutes would not allow anyone to hold more than one hundred shares, the bank made over the stock thus acquired to the society itself, stipulating only that the interest upon it should be devoted in perpetuity to the interests of the inhabitants of the co-operative houses, rewarding meritorious workmen and helping those who were in distress through no fault of their own. With these resources and with the price of some land which was sold, the buildings were carried on and the artisan quarter at Porta Vittoria was begun, though on a more modest scale than had been originally proposed. By the end of 1886 the society possessed two houses in the Via Crocifisso, worth 190,000 lire, one lodging-house in the Via Campo Lodigiano, worth 80,000 lire, twenty cottages in the Via Conservatorio worth 90,000 lire, a group of [twenty-six cottages at Porta Vittoria of the value of 120,000 lire, and another group of twenty-five cottages in course of construction at the same place which were valued at 110,000 lire. There was also a lodging-house with 138 rooms near these cottages which was worth 190,000 lire. In all, the buildings represented a value of almost a million lire, and the society still held land which had not been built over worth 200,000 lire. In 1887 and 1888 the society entrusted the building of two more groups of cottages at Porta Vittoria to the Co-operative Society of Masons. The unoccupied building area at Porta Vittoria had been reduced at this period to 3,000 square metres, owing to the various sales and cessions made to the commune of Milan for roads. The society, however, had made good this reduction by buying 2,000 square metres of land outside Porta Sempione and Porta Magenta. At the end of 1889 the balance-sheet of the society showed, in round numbers, a debit account of 746,000 lire, of which 400,000 lire were represented by real property and 297,000 lire by grants on credit to the inhabitants of the society's cottages; the credit account at the same date amounted to 317,000 lire, including a balance of 110,000 lire from the loan negotiated in 1883 with the People's Bank. The difference of 429,000 lire represented the total net capital of the society, of which 188,750 lire had been paid up. The extraordinary reserve fund, formed with the profits arising from the sale of land outside Porta Vittoria, amounted to 181,000 lire. In 1889 a dividend was declared of 3 lire per share, representing 6 per cent. on the paid-up capital, though the statutes of the society forbade a dividend exceeding 5 per cent. The value of the shares had, however, been fixed for new members at 80 lire instead of at 50 lire. The houses built by the Milanese society are of two kinds. Cottages for separate families, with two or four rooms and a small kitchen garden, and large four-storeyed lodging-houses. In 1890 there were 101 cottages in all, of which fifty-two had two rooms, forty-two had four rooms, five had six rooms, one had eight, and one had three rooms. There were also the two houses in the Via Crocifisso and the lodging-house outside Porta Vittoria and in the Via Campo Lodigiano. A report appended to the balance-sheet for 1886 states that each of the four-roomed houses in the Via Conservatorio cost the society 5,200 lire, while each two-roomed cottage cost 2,600 lire. The members could obtain a four-roomed cottage for an annual payment terminating in twenty-five years of from 305 lire to 320 lire, according to size. The annual payments for the two-roomed cottages ranged from 150 lire to 160 lire, and lapsed also at the end of twenty-five years. The cottages with larger rooms and gardens which were built outside Porta Vittoria cost on an average 1,400 lire per room. They were let to the members on condition of paying up the principal by instalments, with interest at the rate of 4½ per cent. per annum.

The Anonymous Co-operative Society for the construction of Artisans' Dwellings at Verona was established in 1887, on the same principles as the society at Milan. On December 31, 1889, the paid-up capital of this society amounted to 53,785 lire, and it possessed an untransferable reserve fund of 19,716 lire, arising chiefly from a donation made by the Commune of Verona out of a fund which the local savings bank had devoted to promoting the building of artisans' dwellings. It had also a second reserve fund of 600 lire formed out of the accumulated profits. The society bought 30,000 square metres of land in 1887 for a sum of 19,000 lire. By the beginning of 1890 it had built twelve houses, some for single families with two storeys, a separate entrance and a garden; others, three-storeyed, and large enough to lodge three families, with four, five, or six rooms each. None of these houses had been sold, but they were all let to workmen or employés earning less than 1,600 lire per annum, at rents varying from 13 lire to 25 lire per month.

The Co-operative Society for building cheap Artisans' Dwellings at Lonigo is formed by shares which give the holders a right to a dividend not exceeding 5 per cent. This society affords an instance of a special kind of intervention on the part of the communal administration, other examples of which are to be found among the associations in Romagna. The commune granted 6,000 lire to the society for purchasing building land. It also bound itself to pay annually for thirty years a premium equalling 1 per cent. on the sums invested in the construction of the houses. The Lonigo Society was started in 1885 by the local People's Bank and the Working Men's Agricultural Benefit Society. By 1890 it had acquired 1,210 square metres of land, on which it had built a group of fifteen houses of three different kinds, including (1) ten houses with three rooms one above another with a courtyard, each of which cost 1,833 lire; (2) two houses similar to the former, but with the addition of a stone staircase valued at 2,062 lire each; (3) three houses with two rooms on the ground-floor, two on the first-floor, and a granary, each worth 2,519 lire. The houses of the first class were let for 120 lire per annum, those of the second class for 140 lire and those of the third class for 180 lire per annum. No house could be sold without the permission of the society.

The Anonymous Co-operative Society for building Artisans' Dwellings at Lugo was founded in 1883. It has received much help from private patrons and from the commune, which presented it with a building area of 8,009 square metres, and undertook to give a premium of 15 per cent. on the estimated price of the houses built, besides exempting it for ten years from the communal tax on buildings. By 1890 the society had built forty detached houses, each large enough for one family, which were let to those members who actually earned their living by manual labour, or to those whose wages did not exceed 2 lire 50 centimes per diem. The cost price of houses containing from two to five rooms, with offices, varied from 1,200 lire to 3,562 lire, and the rents were so arranged as to allow the tenants to become owners after [twenty years' occupancy.

The building societies which deviate from the Milanese type fall naturally into two main groups, differing in origin and in character. The Tuscan Associations generally adopt the regulations of the society at Sesto Fiorentino. The capital of this society is unlimited, and is formed of an indefinite number of carati, each composed of fifteen personal shares of 100 lire. Every member must take at least one and not more than three carati. The shares are payable in weekly instalments of 1 lira 50 centimes. The society proposes, as funds come in, to build as many houses as there are carati, and in order to carry on the building with greater rapidity, it is empowered to contract loans. When a house is ready for habitation it is assigned to a member holding one carato, who is bound to pay an annual rent rather above the interest of the capital invested in the construction of the house. The society retains the ownership of each house until all the holders of one carato have been put into possession of a dwelling, after which the society, having settled all its debts, will be dissolved (presumably in about twenty years after its foundation), and the houses will become the property of the members, among whom any balance of funds in hand will also be divided. New members are admitted on paying up all the weekly contributions that have accrued since the foundation of the society with the relative interest. No member can sell his carato without leave, and if he fails to pay what is due from him, his carato is put up to auction, nor does he receive any share of the proceeds of the sale unless they exceed his debt to the society. This provision of the statutes, however, has never yet been enforced, and an amendment is now under consideration in favour of reimbursing the defaulter for all the capital he has paid up. The society at Sesto Fiorentino was founded in 1885. At the end of 1889 it had 69 members, holding 81 carati each of 15 shares. The subscribed capital amounted to 130,500 lire, of which 27,274 lire 50 centimes had been paid up in weekly instalments of 1 lira 50 centimes. Twenty-four two-storeyed cottages, detached and with a small garden plot, had already been built, and six more were in course of construction. Each cottage had an entrance passage, a parlour, a kitchen and two bedrooms. They were assigned to the members by lot, on condition of an annual payment of 150 lire, in addition to the weekly contributions, to be continued till the dissolution of the society, which must take place not more than twenty years after the date of its foundation. This term, however, might be prolonged by a prorogation of the society, if from any unforeseen cause it should be prevented from fulfilling its engagements in the appointed time. The Tuscan group of societies includes the building associations at Prato in Toscana, Florence and Brozzi, and the Working Men's Building Society at Galluzzo, which was founded in 1868, and was about to be dissolved in 1890, having finished its work. In 1868 it numbered 112 members, who paid an entrance fee of 20 lire and a weekly contribution of 1 lira towards their shares. They also engaged to give one day's work, on a holiday, once a month, for the construction of the

buildings, 28 workmen being employed every Sunday. In 10 years 14 four-storeyed houses were to be built, each having eight sets of apartments (*abitazioni*), two on each floor. At the end of the 10 years only part of this scheme had been carried out, and some of the members left the society. By 1887, however, the remaining apartments had been completed, and all debts had been paid off.

The Ligurian group of building associations take the Genoese Anonymous Co-operative Society for the erection of Artisans' Dwellings as their prototype. In this society each member must hold one share, paying annually a sum of 25 lire, 75 lire or 100 lire, according to the class of shareholders to which he desires to belong. The shares are personal, and not more than 1,000 may be issued. As the houses are ready to be inhabited, sets of apartments in them are assigned to the members by lot. From the day on which he receives his apartments the member substitutes for the annual payments towards the shares a yearly rent of 300 lire for the first class of shareholders, 360 lire for the second class and 420 lire for the third class, until the sum total of these payments and the former contributions equals the value of the apartments. The title deeds are not placed in the possession of the member until he has paid up at least 1,000 lire; for the balance, the society holds a mortgage on the property till the payments are completed, when the member enters into full ownership. The society does not pay dividends, and no distinction is made between the various classes of shareholders, since all the houses are exactly alike. Although the regulations of the society appear simple, the distribution of burdens and benefits is decidedly unequal, since those who obtain apartments at an early date have a considerable advantage over the others. An attempt is made to remedy this inequality by an article in the statutes, which provides that the holders of the first half of the shares to which apartments are allotted shall pay a graduated premium to the society, varying from 1,500 lire to 100 lire, according to the date at which the respective apartments were granted out, while the holders of the second half of the shares who have not received their apartments shall be awarded a gradually increasing premium from the society. New members have to pay a sum equal to the capital represented by each of the old shares, with interest from May 12, 1867. This sum may be paid by instalments, but until the whole is paid up the new member is not admitted to his full rights. Voluntary withdrawal from the society is not allowed, but a defaulting member may be expelled. In this case his

share is put up to auction, or his apartments are forfeited. A shareholder may, however, with the society's consent let or sell his apartments. The society will dissolve when all the members have been provided with apartments. The Genoese Society was founded in 1868. At the end of 1889 it had built thirteen houses, occupying an area of 7,300 square metres, and had eight still in hand. The houses were six-storeyed, with 449 sets of apartments, each containing a kitchen, a sitting-room and three other rooms. Four houses had an inner court, eight had a garden, while one had both a garden and a court. The total number of members was 800, of whom 396 had received apartments in 1890. The total capital paid up by the members on December 31, 1889, amounted to 2,687,500 lire. The society had a reserve fund of 258,487 lire, and a "premium fund" of 300,700 lire formed of the premiums paid by the first shareholders who had received apartments. To the Genoese type of building association belong the Anonymous Co-operative Society for the construction of Artisans' Dwellings in Genoa, the Emancipation Co-operative Society at Pegli, and the Anonymous Co-operative Society for the construction of Cheap Houses (*casa economiche*) at San Pier d'Arena. The last-mentioned association, which was founded in 1875, numbered 252 shareholders on December 31, 1889, and had a paid-up capital of 434,136 lire. The members paid 78 lire per annum on their shares till apartments were allotted to them. They then paid 300 lire yearly till the sum total reached the value of the apartments. At the end of 1889 the society had bought 4,282 square metres of land in lots. It had built four large seven-storeyed houses divided into sets of apartments, each with three rooms, an entrance and a kitchen, and 109 sets of apartments were already occupied. The Anonymous Co-operative Society for the construction of Houses in Genoa and a few other associations differ slightly from the Ligurian type in their regulations concerning the payment of premiums by the members, the admission of new members, and the dissolution of the society. The members of both the Tuscan and the Ligurian Associations are chiefly drawn from the middle classes and from the better class of artisans, since the annual contributions are too high to be paid by an ordinary labourer.

Forty-two out of the sixty-nine existing building societies had built at least one house by the end of 1889, five which had been recently founded had just begun to build, ten had not constructed a single house, and of the remaining twelve no details were known.



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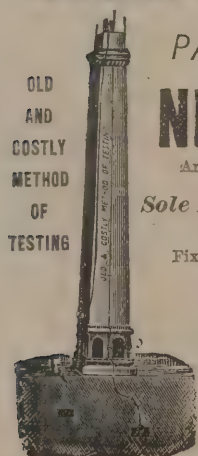
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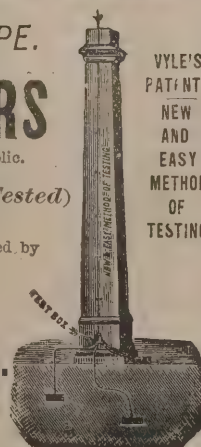
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CONSTRUCTION OF GASWORKS.

At the meeting of the Institution of Civil Engineers on April 3 a paper was read on "The Construction of Gasworks," by Mr. Charles Hunt.

Since Mr. H. E. Jones's paper was read before the Institution in 1875, the consumption in England of coal for gasmaking purposes had risen from 5½ million tons to over 11 million tons. The greater output of gas which these figures indicated had been largely supplemented by conditions due to concentration of manufacture, so that while it might be safely assumed that the majority of gasworks had been doubled in capacity during the last eighteen or nineteen years, it was also certain that in some cases even this rate of growth had been conspicuously exceeded.

In describing the construction of gasworks of the most modern type the author took for his text the Windsor Street Works at Birmingham, recently completed from his designs. There the dominating idea had been unbroken railway communication to the furthestmost point of delivery within the works, the position of the retort-house having been made to subserve this end. In carrying it out two series of curved lines, crossing each other in opposite directions, lead to the retort-houses. These lines were overhead, 20 feet above ground level and 10 feet above the charging-floor of the retort-house, so that coal was stored in the yard to a depth of 20 feet, and in front of the retort to about half that depth by simply dropping it from the railway waggons. Water-carriage was available for the disposal of the coke, which was loaded at a comparatively small cost into boats brought to within a few yards of the retort. Equal facility for loading railway waggons was afforded by a coke-loading dock, 6 feet deep, running parallel with the canal arm. This system had been first adopted at Leicester, where Mr. Alfred Colson had also demonstrated the superiority of an inclined railway worked by a locomotive over a hydraulic waggon-hoist for dealing with any considerable amount of traffic.

In delivering the coal to the retort-house, it was obviously advantageous to reduce the handling to a minimum. Where this could not be done on the level with the railway, it might be effected on the system adopted at the Glasgow gasworks, where an inclined railway of the ordinary gauge had been constructed from the main line siding, rising to the top of the coal stores, 17 feet above the charging-floor of the retort-house and worked by a small tank locomotive. Where soft coal was used,

however, the breaking up which resulted from dropping the coal from a height was an objection. The author cited an experiment made at the Windsor Street Works which showed that not only was the value obtained from a mixture of lumps and dust much less, but that the charge took half as long again to work off. It thus appeared desirable to ease the fall of the coal by an inclined shoot and to select a charging-machine which required the coal to be broken up the least. It might occasionally be found practicable to place coal-breakers at such an elevation as to deliver from them direct into the hoppers, but it was a matter for consideration whether it was not preferable, generally, to choose a low-level for the delivery of coal for daily use, and have recourse to elevators for raising it to the required level. The cost of unloading coal delivered by water was greater than from railway trucks, and there was occasional loss through transhipment; nevertheless, improved appliances at the Nine Elms Works had reduced the cost for labour only from 4d. to 2½d. per ton.

With regard to carbonisation, the author remarked generally that it was perhaps easier to contrive economies with the material in bulk than in detail, as it had to be dealt with in the retort-house, although in the latter case the margin for saving was decidedly larger. How much coal might profitably constitute a charge had never been definitely determined; there was good ground for the opinion that the best all-round results were obtained from small charges combined with moderate as distinguished from very high heats. It had been generally assumed that the deficient yield of tar which usually accompanied the use of a high carbonising temperature was fully made up by increased production of gas. In the author's experience, however, the highest production of gas has been accompanied by the largest yield both of tar and ammoniated liquor. It was also believed that a high yield and consequently high temperature were most productive of illuminating value. Experiments at the Windsor Street Works showed that there was a falling off of illuminating value when very high yields of gas were obtained. While the best general results were to be obtained from carbonising at a fairly high temperature, it was essential that the gaseous products should be enabled to pass freely away and without encountering in the ascension-pipe any absorbent of hydro-carbons such as thick tar. When obstruction occurred to any extent in the shape of stopped pipes—and with high heat this was seldom wholly absent—the loss thus occasioned was likely to turn the scale in favour of a lower temperature.

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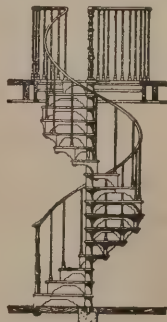
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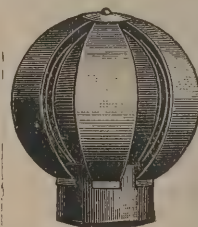
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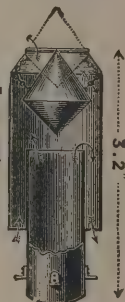
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than the size of the retort. The author favoured the oval shape, as enabling the coal to lie within it in a fairly even layer, as allowing the coke to be more easily drawn than from the ordinary flat-bottomed D, and as being very durable. Some retorts of this type had been under fire continuously at the Windsor Street Works for 1,567 days. Direct firing was, only a few years ago, universal, but the modification of the Siemens system of regenerative firing known as continuous recuperation was being regarded with steadily, almost rapidly, increasing favour. Its chief advantages were a saving in fuel and in labour in attending to fires, and greater carbonising capacity. These three advantages were considered in detail and figures given in support of the author's conclusion.

The influence of condensation on the deposit of naphthalene was generally recognised. Hot or slow condensation, by keeping the gas in contact with the lighter constituents of the tar until a comparatively low temperature was reached, usually resulted within the works in the disappearance of this deposit; it might, however, be doubted whether this remedy was a wholly satisfactory one, seeing that it did not attack the evil at its root. The appearance of naphthalene might be regarded as an indication that all was not right with the carbonising arrangements, and the question arose whether so high a heat as that at which naphthalene was produced was necessary or even desirable for the economical carbonisation of coal.

With regard to washers and scrubbers, much controversy had arisen as to the tower-scrubber. The author was of opinion that in bulk, cost and manageability it left much to be desired. A great improvement had been effected by the introduction of rotary washers, but with these much more driving-power was required than sufficed for working the water-distributor of the tower-scrubber and the wear and tear was greater. Dr. Lunge's "plate-tower" was described, in which a series of perforated plates made of porcelain or earthenware superposed within a cylinder compelled the breaking up of both gas and liquid at every interval between the plates. In a gas-washer devised by the author, of which a description was given, the amount of back-pressure represented the mechanical power it required.

In regard to purification, the terms recently granted by Parliament to the Crystal Palace District Gas Company, under which the maximum amount of sulphur (other than sulphuretted hydrogen) allowed in the gas was fixed at 20 grains per 100 cubic feet throughout the year, marked a departure from the stringency hitherto prevailing in connection

with this subject that might with advantage to the consumer be made more general. The author gave the results of a three winter months' trial of the lime and air process at Windsor Street Works, in which the sulphur compounds were reduced from about 40 to 45 grains per 100 cubic feet to an average of 14.1 grains per 100 cubic feet. The lime used was about 2.45 tons per million cubic feet of gas, the quantity of air admitted at the condensers being from 1 to 1½ per cent., though very much larger quantities were occasionally admitted without increasing the quantity of sulphur compounds. Subsequently, upon the adoption of this process for the whole of the make, the coal having been charged in the interval, the sulphur compounds occasionally rose to over 40 grains, while the lime used was 3.77 tons per million cubic feet. This unsatisfactory state of things lasted until it was found to be largely due to the admission of air. Since then air has been rigidly excluded. Daily tests were made of the amount of oxygen in the gas, and it was almost invariably found that when the oxygen went up the sulphur compounds followed. From this experience it might be concluded, (1) that oxygen, so far from assisting in the removal of sulphur compounds, was actually prejudicial, at all events when present in any appreciable quantity; (2) that it was of use mainly for oxidation of the sulphuretted hydrogen by which economy of lime was effected, and the spent lime, being chiefly in the form of carbonate, with a large percentage of free sulphur, was rendered practically inodorous; (3) that the quantity of oxygen, either pure or as atmospheric air, which might be safely employed, having regard to reduction of sulphur compounds, varied with the CO₂ present, i.e. the less CO₂ the more oxygen. It further appeared that unless air could be almost completely excluded, the lime and air process was less suitable for the removal of sulphur compounds than one in which each impurity was separately attacked.

THE BIRMINGHAM COUNTY COURT.

THE death of the senior Registrar of the Birmingham County Court, after an illness which was attributed to the defective condition of the offices in which his duties were carried out, has drawn attention to the defects of the whole of the Court-house buildings. Mr. Registrar Parry, in course of a conversation with several representatives of the press, said that he felt very strongly about Registrar Cole's death, because it was caused by the draughts and stinks of the court. It was more than ten

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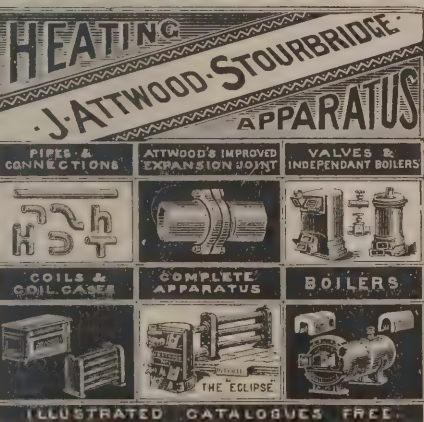
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years since they removed to the present court, which was then a newly-erected building, and was not then fully completed. The water used to stream down the walls of the court. Mr. Cole's good constitution was of use to him, and he managed to bear it without much inconvenience, but that was not the case with others, and he (Mr. Parry) had seen Mr. Alfred Young and other counsel who practised at the court sitting in their ulsters and top-coats, and a motley crew they looked. When the building was being erected the Registrars were consulted, and protested against the system of ventilation, but although their assistance and advice were sought they were entirely disregarded, and the air shafts were placed in the window ledges. The draughts were so bad that the system had to be altered; but he well remembered that a gentleman named Hayes caught a severe cold and died, and it was alleged at the time that his death was owing in a great measure to the draughts that were found in the court. He himself had suffered a martyrdom through it, and he had been away a month at a time through sitting in the draughts and the damp of the court. The Board of Works, with whom they had communicated from time to time, altered the air shafts, and put others in, which made the place a little better. The deceased, who was a younger man than he was, at length began to be affected in the same way he (Mr. Parry) had been affected. He had a series of illnesses, and four or five years ago was compelled to undergo an operation, since which his health had not been so good. Continuing, Mr. Parry said that not only did they have draughts in almost every place in the court, but their own rooms, and Mr. Cole's in particular, had been something frightful. Several years ago, when he had recovered from his illness, the deceased Registrar informed the Board of Works as to the condition of his room, and had a fierce conflict with the man who represented that department. He had often called him (Mr. Parry) into his room, and asked him what he thought about the draughts which prevailed. When he made his complaints the windows were filled up and all sorts of things done to remedy the defect, but still it had been the same always, and, added Mr. Parry, "in my opinion, as I said before, his illness—the serious illness that he has suffered and borne up so bravely against—has to a large extent been caused by the draught and by the stink of the court." Going on to speak of the foul atmosphere of the court, Registrar Parry said that Sir Henry Hancock had suffered from the bad air, and had done his very best to get an alteration effected. He wrote, the speaker believed, some rather energetic letters

to the Board of Works about it, and about a month ago an officer from that department came down and saw Sir Richard Harington and himself. He explained and pointed out to that gentleman what they had to complain of, but they had not yet had a remedy. For the last two or three years the deceased Registrar had had a sort of chronic cough and had never been free from a cold, for no sooner had he got rid of one than he would catch a fresh cold in some room of the court. When they last saw each other the deceased, who was very low-spirited, said, "Parry, I think I am going to die, and you will be senior Registrar. Don't you have my room, or it will kill you."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 6144. William Willis, for "Improved detachable joint between lead and metal or earthenware pipe."
- 6161. Joseph Edward Cornford, for "Improved window-blind pulley."
- 6186. Walter Scott Alexander, for "Improvements in valves."
- 6209. Joseph Johnson, Thomas Cole and William Lawes Cole, for "Improvements in portable fire-escapes."
- 6239. Edward John Griffin and James Macnab, for "Improvements in and relating to steam valves."
- 6266. George Herbert, for "Improvements in the manufacture of weights for scales."
- 6288. Alfred Julius Boulton, for "Improvements in springs."
- 6296. Joseph Eggo, for "Improvements in window-fasteners."
- 6379. Adam Hunter, for "A window-lock."
- 6391. Charles A. Monday, for "A new sash-window."

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

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ALSAGER.—May 2.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

BANGOR.—April 24.—For Building Vagrant Wards. Mr. R. Benjamin Evans, Guardians' Offices, Bangor.

BEKESBOURNE.—For Building Infectious Hospital. Mr. W. J. Jennings, Architect, Canterbury.

BIDEFORD.—April 23.—For Building Technical School. Mr. G. Malam Wilson, Architect, Bridge Buildings, Bideford.

BOLLINGTON.—April 30.—For Putting-down Borehole. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

BURY.—April 24.—For Shuttles, Sluices, Gearing, &c., for New Reservoir. Mr. J. Cartwright, Engineer, Bank Street, Bury.

CANNING TOWN.—April 24.—For Construction of Band Stand. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

CHELTENHAM.—May 2.—For External Fire-Escape Stairs at the Workhouse, and other Works. Mr. J. T. Darby, Architect, Tavistock Place, Cheltenham.

COCKERMOUTH.—May 1.—For Erection of Purifier House and other Buildings at the Gasworks. Mr. E. W. Smith, Gas Manager.

CYMMER.—April 21.—For Construction of Passenger Station, &c. Mr. Yockney, Engineer, 46 Queen Anne's Gate, Westminster.

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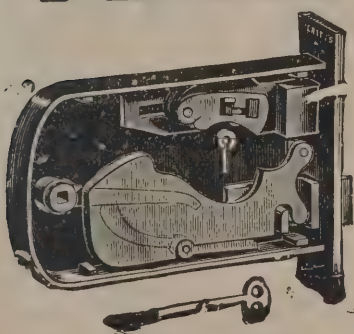
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EXETER.—April 26.—For Additions to Streatham Hall. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

GILFACH-FARGOED.—April 30.—For Building Sixteen to Twenty Cottages. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdeen.

GLASGOW.—April 24.—For Erection of Railway Station Buildings. Mr. Charles Forman, Engineer, 160 Hope Street, Glasgow.

GREAT YARMOUTH.—April 25.—For Fencing and Erection of Lavatory at Yachting Station. Mr. J. W. Cockrill, Borough Surveyor.

GUILDFORD.—April 28.—For Constructing Pavilion on Sports Ground. Mr. A. J. Sturges, Architect, High Street Chambers, Guildford.

HALIFAX.—April 21.—For Rebuilding Saddle Inn. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

HASTINGS.—May 1.—For Additions to Board Schools, Mount Pleasant. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HATTON.—April 21.—For Additions to Asylums. Mr. E. Mansell, Architect, Imperial Chambers, Colmore Row, Birmingham.

HEAPEY.—April 23.—For Construction of Waste Water Purification Works. Messrs. Lomax & Lomax, Engineers, 20 Grosvenor Chambers, Deansgate, Manchester.

KILLMARSH.—April 25.—For Building Business Premises. Messrs. Fisher & Son, Architects, 48 High Street, Eckington.

LEEDS.—April 28.—For Building Two Houses. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

LEICESTER.—May 1.—For Pavilion for Bowling Green. Mr. E. G. Mawbey, Borough Surveyor.

LINTON.—For Building Wesleyan Chapel. Mr. W. H. Thorp, Architect, 61 Albion Street, Leeds.

LLANELLY.—April 30.—For Building Board School for Infants. Mr. J. B. Morgan, Architect, Llanelly.

MARYPORT.—April 27.—For Building Five Houses. Mr. C. Eaglesfield, Architect, Maryport.

MERTHYR DOVAN.—April 21.—For Additions to Colcot Arms. Mr. George Thomas, Architect, Queen's Chambers, Cardiff.

OXFORD.—April 28.—For Alterations to 3 Avenue, Meat Market. Mr. J. J. Bickerton, Town Clerk.

PERRANPORTH.—April 26.—For Building Villa. Mr. Sampson Hill, Architect, Redruth.

RADNORSHIRE.—April 25.—For Construction of Aqueduct (10½ miles) from Dolan to Knighton. Mr. James Mansergh, Engineer, 5 Victoria Street, Westminster.

READING.—May 1.—For Widening and Reconstructing Two Bridges, also New Bridge and Subway near Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

SELBY.—May 1.—For Building Thirty-three Cottages. Messrs. Todd & Thorp, Land of Green Ginger, Hull.

SHEFFIELD.—April 28.—For Building Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SHEFFIELD.—May 2.—For Construction of Public Baths. Mr. C. F. Wike, City Surveyor, Bower Spring, Sheffield.

SHIBDEN.—May 1.—For Building Manager's House, &c, at Sewage Disposal Works. Mr. John Drake, Winterbank, Queensbury.

SUNK ISLAND.—April 24.—For Reclamation Works. Mr. G. Bohm, Engineer, Imperial Chambers, Bowlalley Lane, Hull.

THURSO.—April 30.—For Building Hospital. Mr. James Brims, County Clerk, Thurso.

YORK.—April 28.—For Building Two Semi-detached Villas, Upper Poppleton. Mr. Wm. Hepper, Architect, 4 Spurriergate, York.

WEST HAM.—April 23.—For Additions to Board Schools. Messrs. J. T. Newman & Jacques, 2 Fen Court, E.C.

WILLINGTON.—May 1.—For Rebuilding Pit Laddie Hotel. Mr. Cook, 59 Sadler Street, Durham.

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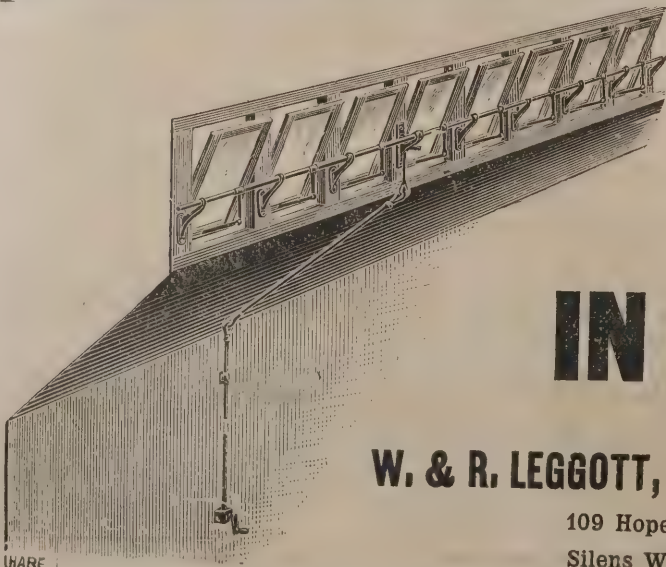
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TENDERS.

ALNWICK.

For Building House, 12 Clayport Street, for Mr. J. R. Stephenson. Mr. GEORGE REAVELL, jun., Architect, Alnwick.

Accepted Tenders.

J. W. Whinham, mason	£119	10	7
W. J. Smith, joiner	99	14	6
J. Pickard, plasterer	29	5	0
Wilkin & Dickman, plumber	26	0	0
J. Purdie, slater	18	4	6
A. Robertson & Son, painter	8	14	6

ARDINGLY.

For Building Congregational Manse. Mr. E. J. HAMILTON, Architect, Brighton.

J. Finch, Hayward's Heath	£541	17	0
W. Wells, Plumpton	498	12	0
P. Anscombe, Lindfield	460	0	0
BOX & TURNER, Ardingly (accepted after reductions)	442	0	0

AUDENSHAW.

For Extensions to the Queen's Arms Hotel, Hooley Hill. Mr. J. H. BURTON, Architect, Ashton-under-Lyne.

Exors: T. Storer, Denton	£290	0	0
Z. Pike, Hooley Hill	281	0	0
J. Williamson, Ashton	280	10	0
J. Gibson & Son, Dukinfield	271	0	0
J. Ridyard, Ashton	249	0	0
A. HOLMES, Ashton (accepted)	244	12	6
J. Robinson, Ashton	240	0	0

AYLESBURY.

For Erection of Composing-room and Machine-rooms for the Kingsbury Printing Works, Aylesbury. Mr. GUEST LUCKETT, Architect, Aylesbury.

W. READ (accepted).

No Competition.

For Erection of Two Cottages in Albion Street, Aylesbury, for Mr. D. Titmuss. Mr. GUEST LUCKETT, Architect, Aylesbury.

Abbott & Son, Chesham	£540	0	0
Gibson, Wycombe	520	0	0
JEWELL, Aylesbury (accepted)	328	10	6
Grimsdale, Aylesbury	317	0	0

AYLESBURY—continued.

For Erection of Small Villa in Wendover Road, Aylesbury, for Mr. G. Aldridge. Mr. GUEST LUCKETT, Architect, Aylesbury.

Fincher, Tring	£432	0	0
Grimsdale, Aylesbury	327	0	0
GIBSON, Wycombe (accepted)	285	0	0
Jewell, Aylesbury	274	0	0

BARNSTAPLE.

For Additions to Science and Art Schools, for the Town Council.

BURGESS & KARSLAKE (accepted)	£300	0	0
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For Providing and Laying 3,000 Feet of Pipe Sewer, with Manholes, Flushing Chambers and Outfall Works, &c., at Swimbridge, for the Barnstaple Union Rural Sanitary Authority. Mr. ARNOLD THORNE, Surveyor, Cross Street, Barnstaple.

Goss & Burgess, Combmartin	£395	0	0
Parminster, Barnstaple	335	0	0
Rew & Liverton, Landkey	299	0	0
SELDON, Barnstaple (accepted)	258	0	0

BEDFORD.

For Roads and Sewers, Campion Building Estate. Mr. HENRY YOUNG, Architect and Surveyor.

Fathers	£1,390	0	0
White	1,222	0	0
Jackson	1,194	0	0
Harrison	1,166	0	0
Wharton	1,150	0	0
Foster	1,046	0	0
Jarvis	1,023	0	0

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For Supply and Erection of Condensers and Connections at Gasworks, Beverley.

R. & J. Dempster, Manchester	£356	0	0
R. Dempster & Sons, Elland	345	0	0
W. C. Holmes & Co., Huddersfield	340	0	0
Newton, Chambers & Co., Sheffield	310	10	0
Hanna, Donald & Wilson, Paisley	310	0	0
C. & W. WALKER, Donnington (accepted)	310	0	0



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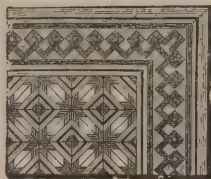
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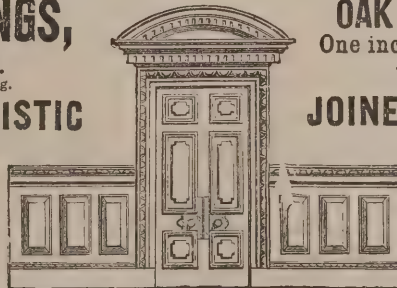
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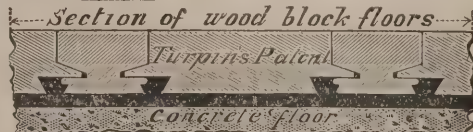
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For Building Laboratory, for the Governors of Beverley Grammar School. Mr. ALFRED BEAUMONT, Architect, Beverley. Quantities by the Architect.	
G. Pape, Beverley	£238 0 0
H. Richardson, Beverley	224 12 0
Potts & Foley, Beverley	222 15 0
J. Constable, Beverley	208 0 0
E. CULVERT, Beverley (<i>accepted</i>)	206 0 0

BLACKBURN.

For Erection of Almshouses off Preston New Road, Blackburn, Messrs. STONES & GRADWELL, Architects, Richmond Terrace, Blackburn.

John Cronshaw, Blackburn.

For Alterations and Extensions to Campsie Lodge, Blackburn, for Mr. J. W. Oddie, J.P. Messrs STONES & GRADWELL, Architects, Richmond Terrace, Blackburn.

W. H. Simm, Blackburn.

For Erection of New Vicarage for St. Andrew's Church, Livesey, near Blackburn, Rev. J. C. Webb, Vicar. Messrs. STONES & GRADWELL, Architects, 10 Richmond Terrace, Blackburn.

J. Highton & Son, Blackburn.

BURTON-ON-TRENT.

For Building Hospital for Infectious Diseases, Horninglow, Burton-on-Trent. Mr. J. E. SWINDLEHURST, Borough Surveyor. Quantities by Surveyor.

J. Varlow, Burton-on-Trent	£9,254 11 1
W. A. Stevenson, Burton-on-Trent	8,531 0 0
G. H. Adams, Burton-on-Trent	8,526 14 0
J. & T. W. Selby, Burton-on-Trent	8,476 0 0
W. Lissaman, Chipping Campden	8,397 6 0
T. West, Burton-on-Trent	8,112 0 0
R. KERSHAW, Burton-on-Trent	8,049 7 5
G. HODGES, Burton-on-Trent (<i>accepted</i>)	7,902 4 10

DARWEN.

For Erection of New Hotel, the Millstone Inn, for Messrs. Henry Shaw & Co., Brewers, Blackburn. Messrs. STONES & GRADWELL, Architects, Richmond Terrace, Blackburn, and Old Bank Chambers, Darwen.

Lloyd & Millward, Darwen.

CLITHEROE.

For Building Weaving Shed, Low Moor, Clitheroe. Mr. HENRY R. PRICE, Architect, 1 and 5 South Corridor, Royal Exchange, Manchester.

Hughes & Stirling, Bootle	£1,972 0 0
T. Ellison, Hindley	1,916 0 0
W. Stones & Sons, Blackburn	1,835 0 0
Peace & Norquoy, Manchester	1,815 0 0
R. Shorrocks, Darwen	1,806 8 9
G. Keeley, Blackburn	1,794 0 0
J. Highton & Sons, Blackburn	1,698 0 0
A. VEEVERS & SONS, Clitheroe (<i>accepted</i>)	1,635 0 0

COLCHESTER.

For Building Schools in Barrack Street, Colchester, for the Colchester School Board. Messrs. GOODEY & CRESSALL, Architects, Victoria Chambers, Colchester.

Girling & Coe, Ipswich	£14,495 0 0
F. Dupont, Colchester	13,760 0 0
R. Beaumont, Colchester	13,670 0 0
W. A. Chambers, Colchester	13,598 0 0
G. Dobson, Colchester	13,500 0 0
C. E. Orfeur, Colchester	13,489 0 0
EVERETT & SON, Colchester (<i>accepted</i>)	13,120 0 0

EXMOUTH.

For Construction of Pavilion on the Pier, Exmouth. Mr. J. JOHNSON, Architect, 9 Queen Victoria Street, London.

Rabbich & Brown, Paignton	£973 0 0
H. Phillips, Exeter	782 0 0
W. H. Perry, Exmouth	733 0 0
C. Brealy, Exeter	666 0 0
F. E. CARTER, Exmouth (<i>accepted</i>)	650 0 0

FALMOUTH.

For Building Free Library, Municipal Buildings, &c., Falmouth, Messrs. WILLIAM H. TRESIDDER & F. J. BELLAMY, Architects.

S. Trehane, Liskard	£6,557 0 0
James Julian, Truro	5,938 0 0
John Colliver, Truro	5,751 0 0
W. H. Moyle, Chacewater	5,700 0 0
ARTHUR CARKEEK, Redruth (<i>accepted</i>)	4,976 0 0

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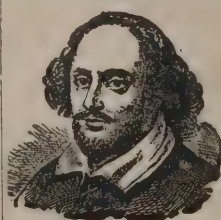
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G. Warhurst, Hadfield	£540	0	0
Garside & Sons, Glossop	505	10	0
Walter Kinder, Glossop	457	1	6
Joseph Charlesworth, Glossop	454	0	0
William Charlesworth, Glossop	453	0	0
Exors. of T. Storer, Denton	418	0	0
Greaves Bros, Ashton	390	0	0
J. B. WILDE, Ashton (accepted)	370	0	0
R. Newton, Glossop	367	0	0
John Ingham, Glossop	365	13	5
E. Marshall, Ashton	358	0	0

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For Laying Cast-iron Pipes, &c., and Constructing Service Reservoirs. Messrs. J. & A. LESLIE & REID, C.E., Engineers, 72 George Street, Edinburgh.

Contract No. 8.

Henderson & Duncan, Edinburgh	£5,501	16	3
J. French & Son, Edinburgh	5,532	12	7
R. E. Brebner, Edinburgh	4,994	6	1
R. Bruce, Stonehouse	4,391	4	7
J. Urquhart, Kilmarnock	4,240	16	8
J. McKnight & Son, Uphall	3,784	3	1
NIMMO & COUPAR, Cowdenbeath (accepted)	3,459	2	9

Contract No. 9.

Henderson & Duncan	£14,216	15	7
G. Mackay & Son, Broughty Ferry	13,522	14	8
R. E. Brebner	13,227	18	7
J. French & Son	12,500	8	10
J. Urquhart	12,124	13	7
J. McKnight & Son (accepted)	11,888	1	9

HUNSLET.

For Construction of Covered Reservoir, Middleton, for the Hunslet Union Rural Sanitary Authority. Mr. J. H. RHODES, Engineer, 92 Albion Street, Leeds.

J. & T. Young, Baildon	£2,303	0	0
G. Oakes & Son, Hunslet	2,150	0	0
Townsend, Watson & Gates, Sheffield	2,100	0	0
J. Akeroyd & Son, Birstall	2,049	0	0
H. Wilson, Great Horton	1,995	10	0
M. Arundel, East Ardsley	1,828	0	2

KINGSWOOD.

For Works, for the Kingswood Local Board. Mr. D. H. W. POWELL, Surveyor. Supplying and Laying Pennant Stone Kerb, Channelling, &c., Vitrified Brick Paving, Supplying and Laying 6,131 Super Yards of Victoria Stone Paving.

Contract No. 1.

M. Lovell, Bristol	£1,125	14	0
F. Free & Son, Bristol	830	6	1
Patent Victoria Stone Company	817	16	1
S. Williams, Bristol	801	7	10
Nixon & Parkes, Bristol	790	3	3
T. Martin, Bristol	772	1	0
W. Galbraith, Bristol	767	9	11
Mangotsfield Pennant Stone Co., Limited	701	17	3
W. Woodey, St. George	687	2	1
W. & G. Thatcher, Hanham (accepted)	662	16	0
Surveyor's estimate	708	1	0

Contract No. 2.

T. Martin	375	0	0
M. Lovell	372	4	6
Patent Victoria Stone Company	372	4	6
W. Galbraith	345	12	9
W. Woodey	316	6	6
F. Free & Son	283	12	0
S. Williams	283	12	0
W. & G. THATCHER (accepted)	278	0	0
Mangotsfield Pennant Stone Co., Limited	274	14	6
Nixon & Parkes	265	17	6
Surveyor's estimate	287	17	6

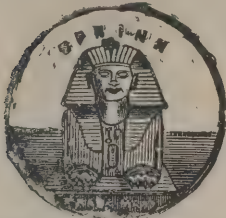
Contract No. 3.

W. Galbraith	2,324	13	5
T. Martin	2,145	17	0
W. Woodey	1,941	9	8
Mangotsfield Pennant Stone Co., Limited	1,915	18	9
S. Williams	1,915	18	9
F. Free & Son	1,864	18	7
PATENT VICTORIA STONE CO. (accepted)	1,839	6	0
Surveyor's estimate	1,839	6	0

LONDON.

For the Erection of Private Residence for Mr. Dale Carr, at Woodside Park. Mr. LIONEL SARGANT, Architect.
H. G. DAVENALL, Southampton Works, Gospel Oak (accepted) £2,000 0 0

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W. Howard & Sons	£64	7	0
W. H. Lascelles & Co.	544	0	0
Sage & Co.	534	15	0
W. SHEPHERD (accepted)	437	0	6

For Sanitary Alterations at 118 Mount Street, Berkeley Square, for Miss Walford. Mr. F. LE ROSSIGNOL, Architect, 1 Gresham Buildings, Basinghall Street.

R. WALKER (accepted)	£25	0	0
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For Sanitary Alterations at Godden Green, Sevenoaks, for Mr. F. Hudson. Mr. F. LE ROSSIGNOL, Architect, 1 Gresham Buildings, Basinghall Street.

WILTSHIRE & SONS (accepted)	£50	0	0
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For Constructional Repairs to 176 Camberwell Grove, for Mr. P. A. Laine. Mr. F. LE ROSSIGNOL, Architect, 1 Gresham Buildings, Basinghall Street.

F. LAWS & SON (accepted)	£27	0	0
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For Pulling Down and Rebuilding the Weavers' Arms Public-house, London Wall, E.C., for Mr. Wm. Dorton. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

	Building.	Fittings.	Total.
Patman & Fotheringham	£4,738	£683	£5,421
W. Watson	4,710	705	5,415
W. J. Walker	4,730	670	5,400
W. Shurmer	4,719	665	5,384
Hearle & Farrow	4,598	664	5,262
Courtney & Fairbairn	—	—	5,225
J. Allen & Son	—	—	4,860
J. & H. COCKS (accepted)	4,660	576	4,636

For Provision of a Cookery Centre in Connection with Board School, Collingwood Street, Ratcliff, and Other Works.

	A
W. Neil	£1,202 0 0
H. Knight & Son	1,175 0 0
E. Lawrance & Son	1,088 0 0
W. Gregar & Son	1,070 0 0
Co-operative Builders, Limited	995 0 0
F. J. Coxhead	934 0 0

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For Pulling Down and Rebuilding the Queen Adelaide Public-house, Hackney Road, N.E., for Messrs. Chandler & Co. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

	Building.	Fittings.	Total.
J. & H. Cocks	£2,499 0 0	£659 0 0	£3,158 0 0
H. Wall & Co.	2,464 0 0	632 0 0	3,096 0 0
Coulsell Bros.	2,064 0 0	659 0 0	2,723 0 0

For Supply and Erection of Gas-engines at the proposed New Pumping Station near Heathwall Dock, Nine Elms Lane, for the County Council.

J. E. Andrews & Co., Limited	£4,165 0 0
Robey & Co., Limited	4,153 0 0
Tangyes, Limited	3,700 0 0
Fielding & Platt	3,500 0 0
Dick, Kerr & Co.	3,045 0 0
Crossley Bros.	2,950 0 0

For New Buildings, Oxford Street and Harewood Place, W., the Corner to be Occupied by the National and Provincial Bank. Mr. ROBERT J. WORLEY, Architect. Quantities supplied by Mr. R. C. GLEED.

Lawrance & Sons	£21,665 0 0
Grover & Sons	20,990 0 0

MANCHESTER.

For Building Inland Revenue Office at Manchester, for the Commissioners of Her Majesty's Works and Public Buildings.

Burgess & Galt, Manchester	£12,995 0 0
R. NEILL & SONS, Manchester (accepted)	12,448 0 0

MANSFIELD.

For Additions to Mansfield Girls' Grammar School.

C. G. Perceval, Mansfield	£760 0 0
Fisher Bros., Mansfield	690 0 0
H. Baker, Mansfield	650 0 0
W. WOODSEND, Nottingham	648 0 0

MARYPORT.

For Reconstruction of Warehouse, Maryport, for Messrs. Carr & Co., Limited. Messrs. JOHNSTONE BROS., Architects, 39 Lowther Street, Carlisle. Quantities by Architects.

G. McKenzie, Maryport	£2,716 0 0
L. Ferguson, Workington	2,162 10 0
J. Beaty, Carlisle	2,070 0 0
S. McWhinney, Workington	1,969 17 2
SMITH & MARSHALL, Maryport (accepted)	1,761 1 8

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Morrison & Mason, Glasgow	£189,555	11	4
Kirk, Knight & Co., Sleaford	177,549	0	0
Whitaker Bros., Limited, Horsforth, Leeds	158,333	7	2
Pethick Bros., Plymouth	155,767	0	0
Bentley & Tempest, Leicester	152,499	0	0
A. Gall, Malvern Wells	139,546	5	9
Watt & Wilson, Glasgow	134,886	19	11
J. AIRD & SONS, London (accepted)	133,511	0	0

SOUTHERNDOWN.

For Additions to Glanmor, Southerndown, for Mrs. Thomas, The Heath, Cardiff. Messrs. VEALL & SANT, Architects, Cardiff.

E. PREECE, Bridgend (accepted)	£225	0	0
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STAFFORD.

For Electric Works for the Stafford Town Council.

J. Lovatt, Wolverhampton, buildings	£3,030	0	0
Robey, engines	2,288	0	0
Hicks, Hargreaves & Co., Bolton, boilers	—		
Electric Construction Company, Wolverhampton, dynamos	1,151	0	0
Rubery & Co., Darlaston, ironworks and roofs	197	0	0

STANDON.

For Building Four Residences in Stortford Road, Standon, Herts, for Mr. Fred. A. Ashton, Architect, 3 Crooked Lane, E.C.

CHAS. CHAPMAN (accepted)	£1,216	0	0
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RUSHDEN.

For Erection of House and Shop, &c., at Rushden, for Mr. J. Colson. Mr. H. A. COOPER, Architect, Rushden.

Trayner	£929	0	0
Bayes & Son	837	0	0
R. Marriott	824	0	0
G. Henson	815	0	0
T. & C. Berrill	803	0	0
Freeman & Sons	798	0	0
H. Sparrow	785	0	0
T. Swindall	765	0	0
H. KNIGHT (accepted)	765	0	0
J. Ball	641	10	0

For Rebuilding Portion of the Old Rectory, Rushden, for Mr. Fred. Knight. Mr. H. A. COOPER, Architect, Rushden.

Freeman & Sons	£976	0	0
G. Henson	945	0	0
Trayner	925	0	0
T. & C. Berrill	883	0	0
Bayes & Son	856	0	0
R. Marriott	850	0	0
H. Knight	820	0	0

USK.

For Additions and Alterations to The Priory, Usk, Mon., for Mr. R. Rickards, J.P. Messrs. VEALL & SANT, Architects, Cardiff. Quantities supplied.

A. S. Morgan & Co., Newport, Mon.	£1,130	0	0
E. C. Newby & Co., Cardiff	1,024	19	0
John Jenkins, Newport, Mon.	993	0	0
Henry Parfitt, Pontnewydd	990	0	0
Hatherley & Carr, Bristol	897	0	0
KNOX & WELLS, Cardiff (accepted)	895	0	0

WINCHESTER.

For Reconstruction in Steel and Brickwork of Four Arched Bridges over the London and Basingstoke Canal between Fleet and Winchfield. Mr. JAMES ROBINSON, County Surveyor, 13 Southgate Street, Winchester.

J. White, Bournemouth	£3,885	0	0
A. Thorne, Westminster	3,541	0	0
Playfair & Toole, Southampton	3,121	0	0
Jackaman & Son, Slough	2,998	0	0
G. Double, Ipswich	2,908	9	0
Murdoch & Cameron, Glasgow	2,835	19	2
J. Thumwood, Basingstoke	2,766	10	2
B. COOKE & CO, Battersea (accepted)	2,341	0	0

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TRADE NOTES.

WE are glad to learn that the London and Lancashire Fire Insurance Company have had another marvellously successful year, and have just declared a dividend at the rate of 20 per cent. The annual accounts have just been issued to the shareholders. They show a net premium income of 868,138*l.* 14*s.* 9*d.*, and a net credit balance on the year's operations of 26,453*l.* 3*s.* 8*d.* The directors propose to pay the same dividend as for last year, viz. (including the interim), 10*s.* per share, or 20 per cent. on the paid-up capital. The financial position of the company will then stand as follows:—Capital paid up, 212,750*l.*; reserve funds, exclusive of capital, 660,259*l.*; reserve capital at call of directors, 1,914,750*l.* We trust that the company will long continue to enjoy its present prosperity.

THE *Leeds Mercury* says:—Messrs. E. P. Taylor & Co., Littleborough, have secured the contract for the construction of the new line, about 2½ miles, at Poulton, on the main line from Preston to Fleetwood.

THE Aberdeen Town Council have agreed to widen Beechgrove Terrace, at a cost of 824*l.*

THE Gas Trustees of Greenock have resolved to recommend to the Police Board the immediate adoption of the system of manufacturing gas from oil. The initial cost is put at about 1,500*l.*

A LARGE clock, with four 5-foot illuminated dials and striking the hours and quarters, has just been fixed in the tower of the new buildings, Cheetham Baths, Manchester. The work has been carried out for the Corporation of Manchester, under the direction of the architects, Messrs. Booth & Chadwick, Manchester, by John Smith & Sons, Derby, makers of St. Paul's Cathedral clock.

THE *Carlisle Journal* says:—Messrs. Beatty Bros., contractors, of this city, have again secured the War Department's triennial contracts for the whole of the artificers' work at the Castle. This work has now been let to them continuously for twenty years.

WE hear that Messrs. Alfred Williams & Co., hydraulic engineers, 39 Great Eastern Street, E.C., have recently fixed one of their 30-foot diameter "Halliday" direct acting wind-mill pumps over a shaft 130 feet deep, at St. Austell, Cornwall. This machinery is delivering 5,000 gallons per hour into an elevated reservoir, from which the surrounding district is

supplied with water. This firm has also contracts in hand for similar work at Maidenhead, Leeds, Chester, Oxford, and Wickham Market.

IN memory of the late Mr. John Haggas, of Oakbank, a four-dial Westminster quarter chime clock and bells from the factory of Messrs. Wm. Potts & Sons, of Leeds, has been placed in the tower of St. John's Church, Ingrow. The going train is the gift of Mr. Herbert and Mr. Fied Haggas, but the chimes, &c., have been raised by voluntary subscriptions.

VARIETIES.

THE Ripon City Council have adopted a scheme proposed by Mr. A. E. Preston, C.E., of Bradford, for works of sewage purification, intercepting sewers and new main sewers for the city. It is proposed to treat the sewage by intermittent filtration, for which 25 acres of land will be required. Mr. Preston's estimate of cost is (including land, 2,500*l.*) 17,700*l.*

THE collapse of a quarry is reported from Pemberton, Wigan. The men had just concluded operations when the sides of the quarry gave way, and the machinery at the surface was precipitated below and covered with about 7,000 tons of stone and earth. The quarry was worked by Mr. J. Ascroft, and the damage sustained is estimated at 1,000*l.*

VOL. III. of "Cassell's New Technical Educator" has just appeared. It contains nearly 400 pages, which are copiously illustrated. For students this work is a practical repertoire for exhaustive information on every kind of craft and scientific pursuit, besides engineering, building, &c.

WE hear that Dr. Conan Doyle, author of "The Adventures of Sherlock Holmes," is to write a series of articles for *Great Thoughts*.

THE students from the Westminster Technical Institute (which has been formed through the munificence of the Baroness Burdett-Coutts) are invited to visit the Highgate Museum of Sanitary Appliances to-morrow (Saturday) at 3.30, and Mr. T. de Courcy Meade, under whose direction the museum has been formed, has undertaken to briefly address the students.

THE Preston Board of Guardians have passed a resolution protesting against the extravagant expenditure of the Lancashire County Council, and calling upon them to control their expenditure so as to give relief to the oppressed taxpayers of the county.

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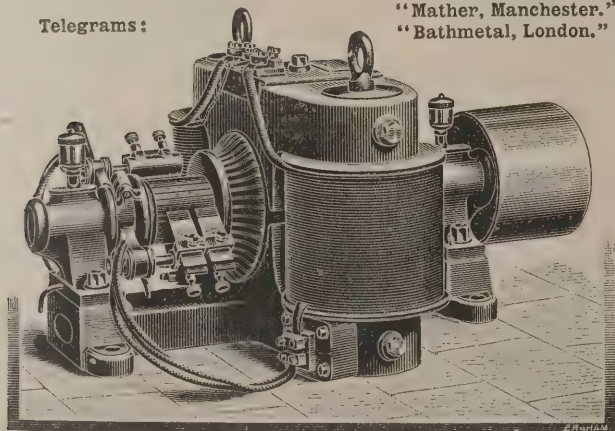
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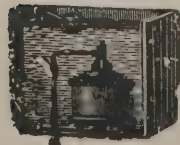
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PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever,
and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1886, November 1887,
and May 1870. *The Lancet*, January 12, 1887.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1866, and December 1872.

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157 STRAND, W.C. (Four Doors from Somerset House), LONDON.



THE purification of the water of Leith, it is said, may cost 250,000*l.* Edinburgh will be responsible for 19-25ths, and Leith for the remainder of this outlay.

THE Local Government Board have empowered the Coventry City Council to further borrow a sum of 2,100*l.* for the new baths.

THE bridges committee of the London County Council have reported that the estimated value of the work executed in connection with the Blackwall Tunnel up to the end of March was 268,773*l.*

A TABLET recording the opening of the Manchester Corporation electric-lighting station has been unveiled by Sir John J. Harwood. The light has been in use in the central part of the city for some months, and the demand for it is so great that an extension of the plant at the generating station is already in contemplation.

THE new bridge over the river Aire at Shipley, in the highway to Baildon, has been opened. At the subsequent dinner Mr. T. M. Holmes, chairman of the Baildon Local Board, proposed the West Riding County Council, and Mr. Waugh, who responded, said the question of expenditure of public money was a very serious matter. It was proposed by the County Council to spend what he believed would run to 100,000*l.* in building offices and meeting-place at Wakefield. If the County Council did elect to spend that money, every man who voted for it he would propose should be admitted to Menston, Wadsley, or Wakefield Asylums, without either doctor's certificate or that of a magistrate.

AT the meeting of the Bedford Town Council a letter was read from the Duke of Bedford, in which he offered to present to the town a field of 22 acres in the vicinity of the Promenade, on the banks of the Ouse at Bedford, for the purpose of providing a public recreation-ground, and enable the Corporation to complete a scheme for the improvement of the spot. The ground was valued last year at 8,500*l.*, when negotiations were opened for the purchase of the land.

THE London Tramways Company, in relaying the trams on the long stretch of road from Church Street, Camberwell, to New Cross Gate, are substituting a solid iron foundation for the rails in place of the wooden sleepers in which they have hitherto been laid. This system of platelaying will obviate the necessity of frequent renewals.

THE public swimming baths at Perth have been presented as a gift to the Town Council.

THE old county gaol for Fife, situated between the Eden and the railway siding at Cupar, has been bought at public auction by Mr. Thomson, banker, for Mr. Watt, seed merchant, Cupar and Perth, at 560*l.*

THE Stamford Town Council have decided to appoint a borough engineer at a salary of 300*l.* a year.

THE tender of Mr. Edmund Gabbutt, Oakes Street, Liverpool, has been accepted by the Corporation for the erection of workshops, stores, offices and other buildings in Pall Mall, Leeds Street and Highfield Street, Liverpool, for the sum of 6,292*l.*

THE Manchester Corporation having sanctioned the paving of several streets in the central portion of the city with wood, the Highways Department, through a sub-committee, have made very careful inquiries as to the best material to be used. Early in March a letter was addressed to the principal corporations, vestries and boards of works in the United Kingdom, which elicited much useful information. An inspection was also made by a deputation of the wood pavements in various parts of London. The conclusion of the sub-committee is that the most suitable kinds of wood pavements to adopt for the Manchester streets are beech (creosoted or otherwise preserved) or Australian hardwood pavements, laid with close joints, and grouted with pitch and tar, and they recommend that experiments be made with both of these classes of pavement in the streets ordered by the committee to be paved with wood.

BUILDING AND BUILDERS.

MESSRS. MARSHALL & SNELGROVE have just opened the first portion of their new premises in Vere Street, and have also in contemplation the reconstruction during the autumn of another part.

THE watch committee of the Liverpool Corporation have approved of plans submitted by the city surveyor as to the proposed alterations and additions to the Central Fire Station and Police-buildings in Hatton Garden, at an estimated cost of 26,000*l.*

THE *Irish Times* says:—Portumna Courthouse collapsed shortly after the conclusion of the business of the Quarter Sessions, conducted by County Court Judge Henn, Q.C. The roof and ceiling fell in, covering the body of the court with debris to the depth of 7 feet. The four walls are intact, being built of solid masonry, but otherwise the building is a wreck. The litigants, lawyers and others who had occupied it just

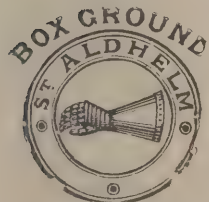
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before the occurrence had a remarkably narrow escape. The building was of ample proportions, and in internal arrangements superior to what is generally found in provincial towns. The cause of the collapse is attributed to the action of the recent heavy rain in contracting the joists to which the laths of the ceiling were nailed.

A NEW college for the Franciscan order, designed by Messrs. Pugin & Pugin, is now in course of erection at Buckingham. The contractor is Mr. Tibbets, of Buckingham.

THE new church of St. Patrick, Coatbridge, N.B., is to be commenced at once from the design of Messrs. Pugin & Pugin, of London.

THE bricklayers and labourers in the building trade at Portsmouth have demanded an increase of wages. The masters consider that as only twelve months have elapsed since the last advance in pay, the demand is unreasonable.

THE Albert Palace at Battersea is to be sold by auction on May 29. It is in good preservation, and is expected to average a fair price. Mr. Herbert Gladstone, on the part of the Office of Works, is the vendor.

MANCHESTER SHIP CANAL COMPANY.

THE following official statement has been issued by the Manchester Ship Canal Company:—"From the statement submitted to the board on Saturday, the 14th inst., by the chairman of the finance committee, Sir Edward Jenkinson, it appears that the cash balances and other available assets, including the five hundred thousand pounds remaining out of the two million pounds authorised to be lent by the Manchester Corporation under the Act of 1893, amounted on January 1, 1894, to 1,353,482*l.* The following is the forecast of the financial position of the company on January 1, 1895:—"After providing for all works already ordered by the executive committee, including six dock sheds, three storeys high, and twenty hydraulic cranes ordered since the date of the shareholders' meeting in February last, for dredging, for the balance owing on purchases of land, for working expenses, and for interest on all loans for the year 1894, and taking traffic receipts at a low estimate, the sale of plant at only 20,000*l.*, 12,000*l.* having been received since January 1, and without estimating receipts from sales of land, there is a balance of 381,515*l.* Some portion of this balance will probably be expended by the executive committee on further necessary works. The company owns about

2,600 acres of surplus lands, the value of which is already large, and will steadily increase. The value of the plant now available is also very considerable."

BAKER'S PATENT DRIP LUG.

THE above patent drip lug is for rain-water, soil, and other pipes. The drip formation of the lug or ear prevents any overflow running down the pipe from touching or soiling and making damp the wall to which it is fixed, the overflow running down the pipe to the bottom of the same. The projection renders it possible to properly paint behind the pipe, to make secure and accessible soil and other joints, and to paint or cement the wall behind the pipe after fixing. The ears having three nail holes, one of them is sure to enable a nail to be driven into a joint, avoiding the waste of time plugging and splintering brickwork. The holes not used can be puttied up when painting. String-courses and plinths of 2½-inch projection will be cleared without cutting away and damaging the work. No trouble in future with weather tiling. By means of the angle pipe the difficulties of making an effectual joint in soil-pipes situated in corners or otherwise will be thoroughly overcome.

CARPENTERS AND JOINERS.

THE thirty-fourth annual report of the Amalgamated Society of Carpenters and Joiners has just been issued. It appears from the general secretary's remarks that during 1893 56 new branches were opened and 6 were closed, the net increase of members being 3,408. At the close of the year there were 629 branches and 40,996 members. The aggregate income was 109,722*l.*, being 10,898*l.* in excess of the preceding year, whilst the expenditure was 109,441*l.* The assets of the Society are estimated at 79,449*l.*, or 2*l.* 1*s.* 7*d.* per ordinary member. In unemployed benefit, which is a weekly allowance paid to members thrown out of employment through depression in trade, there has been expended during the year 30,508*l.*, which is at the rate of 19*s.* 5*d.* per member, being 5*s.* 9½*d.* per member more than in 1892, but considerably less than in 1885-88, and the remark is made that the maximum has probably not yet been reached before the decrease again sets in. Sick benefit cost 24,511*l.*, the experience of sickness having been exceedingly heavy, a circumstance largely due to influenza. The payment in respect of strikes and lock-outs was 15,904*l.*

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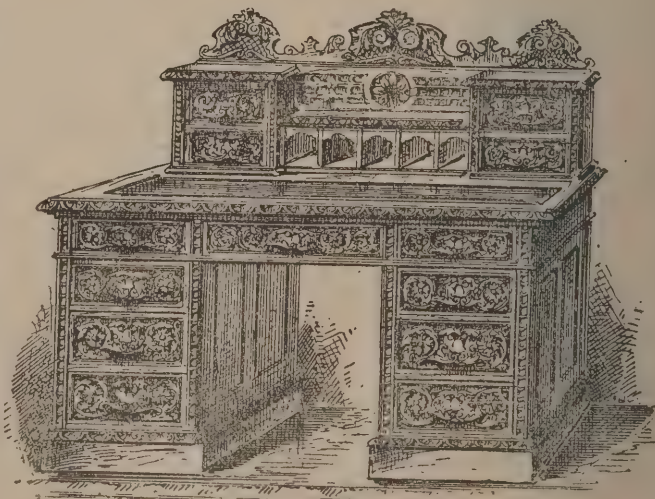
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ILLUSTRATIONS.

FRENCH PROTESTANT CHURCH, SOHO SQUARE.

FRENCH PROTESTANT CHURCH, SOHO SQUARE.—SOUTH ENJ.

SANTA MARIA DEL MAR, BARCELONA.

A STREET IN GRANADA.

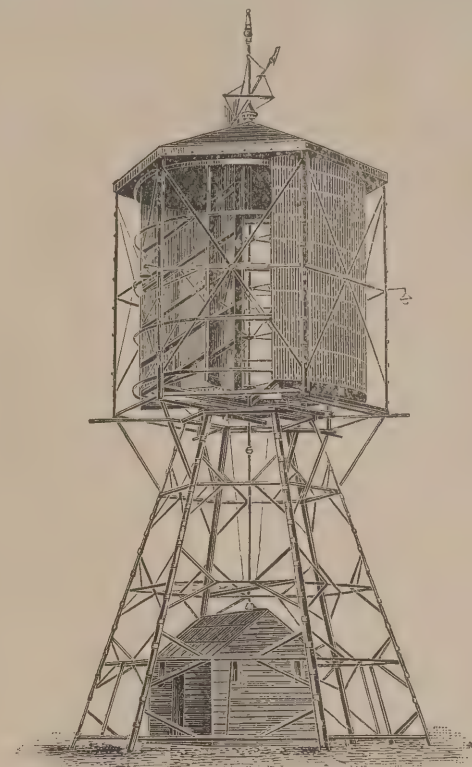
NOTES ON NOVELTIES.

A NUMEROUS party of electrical engineers and members of the press assembled on Tuesday last at Willesden Junction, in response to the invitation of the directors of the Rollason Wind Motor Company, of 13 Berners Street, W., to inspect a new motor which is designed to utilise the air currents for the production of electricity for lighting purposes and motive power, and which was doing some good work notwithstanding that there was very little wind.

The "Rollason" motor, of which we append a sketch, is quite a departure from the ordinary construction of windmills which are now in use, being of horizontal design or arrangement erected within a skeleton turret. From the top to bottom of the centre or axis of the turret is provided a vertical steel shaft having five concave sails attached, which revolve on radius rollers immersed in oil. On these sails are fixed a number of inclined ridges or planes, which deflect the force exerted by the wind to their peripheries. Between the sails and the shaft is arranged a considerable open space which allows the wind to actuate three sails out of the five at the same time. Outside the sails is a framing supported by six radial or cross arms, which are bolted to a centre bearing which is free to rotate independently of the sails. From the top of this shield a second vertical shaft is continued through the roof of the turret, and to this is fixed a vane, so that when the direction of the wind changes it moves the shield into the correct position for only the concave sides of the sails to catch the wind. On the top of the sail shaft is fixed a cup containing a quantity of oil, within which are rollers by which the shaft actuates the shield. The weight of the vane shaft is carried on an independent roller bearing fixed in the roof of the turret. The whole weight of the sails and framing carrying the shield is thrown to the centre bearings on the bottom of the turret,

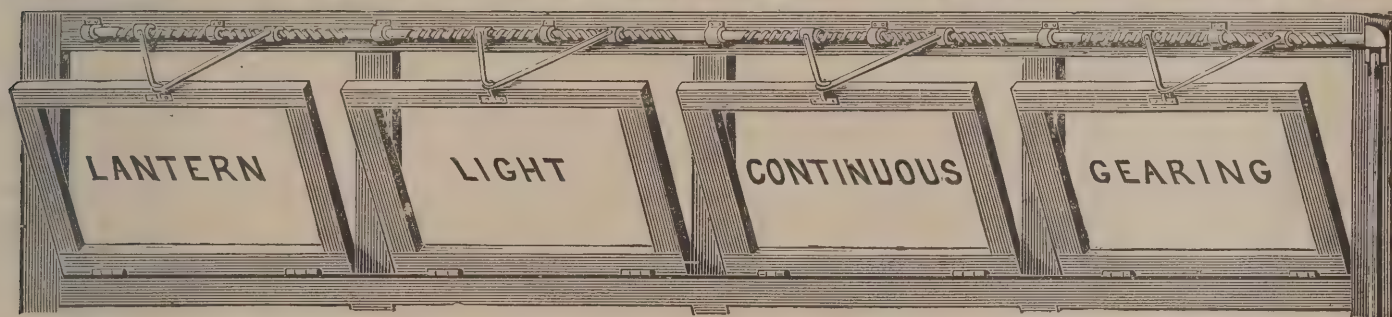
which thus gives to the working parts of the motor the desired balance.

The salient advantages claimed for this invention are its simplicity of construction, efficiency in working, and the few working parts which, moreover, are arranged to run in oil so as

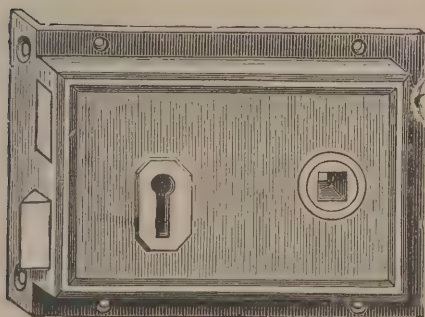


to be always lubricated and prevent corrosion. It can, therefore, be left working for a lengthy period without any attention. Its capability of taking up a breeze or accommodating itself to a gale, its ready adaptability for erection on buildings, as the

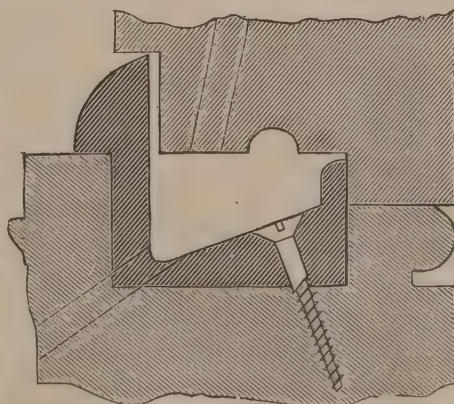
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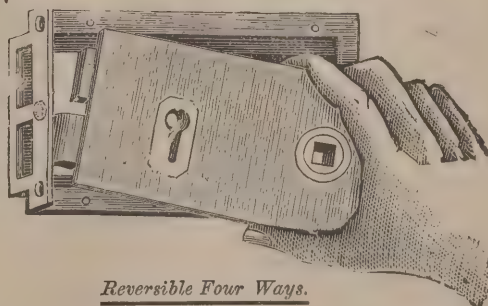


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turret can be built to suit any style of architecture, are further contended features of merit. The motor in question is 20 feet in diameter, is erected on an open iron structure, 30 feet high, and is being used for generating electricity for lighting purposes, producing with twenty-one accumulators 1,500 candle-power, but with additional accumulators, however, it is capable of quadrupling this amount of power. The motor is also equally adapted to the production of power for driving any kind of machinery for which gas or steam-engines would otherwise be used.

There are several automatic arrangements and special features to be noted in connection with the electrical apparatus to which the motor is applied, *e.g.* (1) that for disconnecting the dynamo from the accumulators when the wind drops; (2) that for charging and lighting at the same time; (3) that for stopping the dynamo when the accumulators are fully charged, and for restarting it as soon as any current is used from the accumulators, the object being to let the combined motor and electrical plant work all night and on Sundays without any attention. In factories where motive power is required the electricity generated can be used in the summer or daylight, when no light is required, for driving machinery of various kinds, or for other similar purposes where the electric current or power can be utilised. Obviously the power obtained by the motor can be also employed as a mechanical agent for working pumps or other machinery for water supply. The lightness, cheapness and facility of erection are other advantages claimed for this particular type of wind turbine motor.

THE STRIKE IN VIENNA.

ACCORDING to the correspondent of the *Times* the strike of the Vienna joiners and cabinet-makers, which was decided upon on Monday evening at a meeting held at the Town Hall, and attended by between 12,000 and 13,000 men, began on Tuesday morning. It is calculated that about 12,000 men came out. Their demands are for an eight hours' day, the abolition of piecework, a minimum weekly wage of 10fl., or about 16s. 6d., and the recognition of the First of May as a holiday. The committee of the Employers' Association stated that these questions would be considered at a general meeting of that body on the 25th inst., but on Monday night's gathering of the men this was declared to be merely an attempt to postpone the struggle. The conduct of the latter has up to the

present been exemplary, indicating as it does a high state of organisation and discipline among them, and consequently self-respect and confidence. Another noteworthy feature of the proceedings was the remarkable unanimity and enthusiasm of the men in coming to a decision. Their leaders had submitted the question of a strike to them without expressing any opinion as to what course should be pursued. Indeed, it would appear that there is a stronger inclination to cease work amongst the men than there is amongst the leaders. The present strike includes not only Vienna itself, but some of the outlying districts. A number of carpenters engaged on new buildings went on strike on Monday, their demand being for a minimum daily wage of 2fl. 50kr., or about 4s. A proof of the excellent party discipline maintained amongst them was given next morning by some hundred and fifty men engaged on the buildings of the forthcoming International Exhibition. They threw up their work, notwithstanding the offer of double and triple wages, on the ground that they must stand by their fellows. The architect, who has but a few days more in which to complete the buildings, appealed to the chairman of the strike committee to intervene. It was not until late in the afternoon that he succeeded in getting the men to resume their labour.

THE HISTORY OF SALFORD.

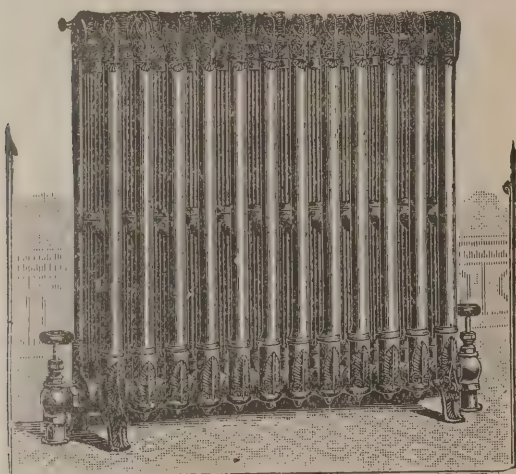
ON the 16th inst. the people of Salford celebrated the fiftieth anniversary of the incorporation of the borough. Opportunity was taken of the occasion by the *Manchester Guardian* to recall the history of Salford as follows:—The Roman encampment at the confluence of the Medlock and the Irwell, on the spot which used to be known as Castle Field, gives Manchester a precedence of some centuries, and carries back its history to a time when hundreds and wapentakes and feudal barons were unknown; and we are carried still farther back if, as is supposed, the site of the Roman encampment had previously been occupied by a British settlement. But, after all, this must be to a great extent a mere matter of names. If the eligibility of a spot attracts a population to one side of a narrow stream, we may be pretty sure that there will be people on the other side. In other words, at whatever date there may have been a Manchester we may reasonably conjecture that there was, on a smaller scale perhaps, a Salford too. This is shown to have been the case when we come down to times that are better

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known. Soon after the Conquest we find the beginnings of modern Manchester on the rather bold bluff which rises above the Irwell close to where it is joined by the Irk. It is where the cathedral and the Chetham College now stand. There was then a church dedicated to St. Mary, and close at hand the residence of the baron who owned the manor, while behind them clustered a little population already addicted to industrial arts. We find at the same time on the lower land across the river a community beginning to form itself, and apparently employed in work distinct from agriculture. These people had the broad lands of the hundred behind them, yet they chose to gather at this particular spot where the Irwell is thrown aside by the rocky cliff and shoots in a comparatively straight course westward. There was no chance in the selection. The communities on the two sides of the river attracted each other. They must have been useful to each other in many ways, and were then, as they have been ever since, substantially one community under two names. But there was one difference between them which had an important result. They were not under the same manorial lord. If they had been they would have received the privileges of a borough from the feudal superior at the same time and been formed into one borough, whereas through their belonging to different lords they were enfranchised at different dates and the municipal division was set up which exists to-day. That the people of Manchester and Salford still form two corporate bodies is due to an incident of feudalism.

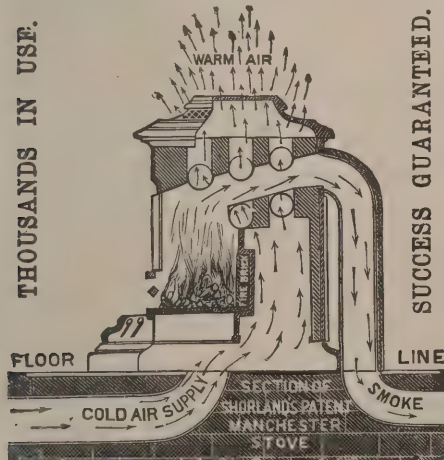
A borough charter was conferred upon Salford by Randolph de Blundevill "in or about" 1231; Manchester received its "great charter" from Thomas de Grelley in 1301; so that Salford is the older borough by seventy years. Judged by their contents these charters do not greatly differ from what would now be described as a Police Act. They confer upon the inhabitants the right of managing their own affairs and lay down certain rules which have to be observed. The most important provision of the Salford charter runs thus:—"Also the aforesaid burgesses and their families, from whomsoever they buy and to whomsoever they sell, wherever it shall be in my demesnes, whether in fairs or markets, they shall be free from all toll except that of salt." The Salford charter is of great historical interest, much greater than that of Manchester. Randolph de Blundevill was one of the most remarkable men of his day. He was Earl of Chester and Earl of Lincoln, and held for a time the Earldom of Leicester. He married Constance of Brittany, widow of Geoffrey, second son of Henry II,

and was thus stepfather to Arthur, the young prince supposed to have been murdered by King John. By right of marriage he sometimes styled himself Duke of Brittany and Earl of Richmond, but it must be added that his wife deserted him and took to herself another husband. He was one of the barons who signed Magna Charta, but he did so on behalf of the king, to whose interests he adhered. In 1229 he received from Henry III. a confirmation of the lands between the Ribble and the Mersey which he had purchased from Roger de Mersay. These were the three wapentakes or hundreds of West Derby, Leyland and Salford, of which he then obtained full possession. For the next two years he was fighting in Normandy and Brittany, but he reached England in 1231, the year to which the Salford charter is assigned. Among local feats, he built Beeston Castle to keep the Welsh at bay, and conferred burgess rights upon the town of Macclesfield. Bishop Stubbs says that his vast possessions, and especially his palatine jurisdiction, "made his position in the kingdom unique," and adds that "he was almost the last relic of the great feudal aristocracy of the Conquest." The granting of the Salford charter, which he confirmed for himself and his heirs "to the end of the world," was almost his last act, for he died the year after. Among the thirteen persons who signed the charter as witnesses was one even more famous than himself, Simon de Montfort, the great Earl of Leicester, to whom we owe the Parliament of 1265, and who fell at the battle of Evesham. It may be safely said that few borough charters are richer in historical associations than that which lies open to inspection at Peel Park.

For several centuries after the date of the charter the accounts we have of Salford are brief and scanty, and even when we come to later times, though there is more information, our position is not much better, since it is not easy to say how much of it relates to Salford and how much to Manchester. Visitors took the same liberties with the two boroughs as is still taken in every part of the world. They came to Manchester, and they described Manchester without making any distinction between one side of the Irwell and the other. This is a misfortune, but since we cannot make people antiquaries against their will it cannot be helped. Perhaps the best bridge across the gulf of time is Salford Bridge, which always retained the name distinctive of the hundred. There is nothing to tell us when it was built, but it is referred to in the will of Thomas del Bothe, an "opulent yeoman" who lived at Barton in the year 1368. He built a chapel on the bridge, where prayers might be offered for the repose of his soul. During the

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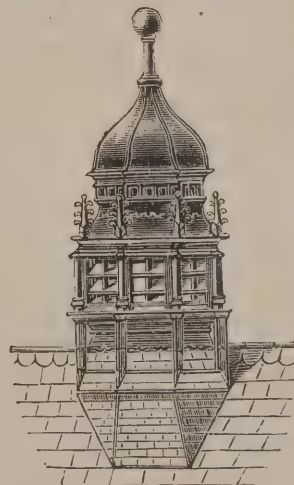
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Commonwealth the chapel was turned into a prison, as was also the college, then belonging to the Earls of Derby. In 1778 the chapel-prison, then apparently in a ruinous condition, was cleared away in order to make room for the widening of the bridge. At last, in 1837, when the period of street improvements set in, the bridge was closed, and a new one built and named after Queen Victoria. The Manchester Court Leet Records abound with references to Salford Bridge. On one occasion the person occupying the premises near the bridge is required to see that the steps leading down to the water are kept clean. On another the owner of a dunghap near the bridge is ordered to abate the nuisance. The Old Church is a "bridge" of another kind. It serves to connect the two boroughs ecclesiastically. Salford was in the parish of Manchester, and the Old Church was for a long time the only place of worship for the people on both sides of the river. In the ninth year of the reign of Henry V. the church was turned into a collegiate church by Thomas de la Warre, at that time rector. The church had been dedicated to St. Mary from the beginning, but just before the change the battle of Agincourt had been fought and Henry V. recognised as heir to the French crown. Accordingly, on the new foundation the church was dedicated to St. Mary, to St. Denis (the patron saint of France), and to St. George (the patron saint of England). It would perhaps be difficult to say whether the virtue of this triple dedication still survives. At length it seems to have been felt that further provision was necessary for the spiritual wants of Salford. In 1634 Humphrey Booth the Elder laid the foundation of the Sacred Trinity Chapel, the name being perhaps intended to show the relation in which the founder wished it to stand to the old parish church. A subscription of 200*l.* was raised towards the cost; the rest was defrayed by Booth. The good man, then in feeble health, earnestly prayed that he might be permitted to partake of the sacrament in the new chapel. This granted, he would not care to live any longer. The sacrament could not be celebrated in the place till after its consecration, and this involved some considerable delay. But he had his heart's desire. He lived to partake of the sacrament, but he got home with difficulty, and never went out again.

Humphrey Booth was a munificent benefactor to his native town. He left by his will certain property in Piccadilly and Oxford Street, directing that the yearly rents and profits "should be for ever yearly, faithfully, and wholly disposed of for the

succour or relief of such poor, aged, needy, or impotent people as for the time being should inhabit or dwell within the town of Salford, and by the judgments and good discretions from time to time of the two constables of the said town for the time being, and of such churchwarden yearly, in the parish church of Manchester, as should from time to time be elected churchwarden for the town of Salford, or of any two of them, whereof such churchwarden should be one, should be deemed to have need thereof." The property thus put in trust was, as has been seen, situated in Manchester, and has risen in value with the prosperity of the town. Twenty pounds a year is mentioned as its value in Booth's lifetime. From the statistics given at the recent Easter meeting it appears that for the last twenty years the sum distributed among the poor amounts to a yearly average of nearly 7,000*l.* Humphrey Booth the Younger, grandson of the elder Humphrey, by his will of 1672 "devised certain premises therein named towards the repairs of the chapel of Salford," and in the case of an overplus he directed that it should be distributed among the poor at Christmas in the same way as the money left by his grandfather. Trinity Chapel was rebuilt in 1753, having then become ruinous. It is interesting as the mother church of Salford. The radiation from this centre went on slowly. St. Stephen's, the next in point of antiquity, was built in 1794—just one hundred years ago. St. Philip's followed in 1825, the cost being covered by a Parliamentary grant of 14,000*l.* Of more importance was the erection in 1831 of Christ Church, Acton Square, for the late Rev. Hugh Stowell, who had previously held a curacy in Salford, and who was for many years a potent force in the religious life of the community. The other churches are all of more recent date. Long before this the Nonconformists had begun to take up their share of spiritual work. Gravel Lane Chapel, the mother church of Salford Methodism, was opened in 1790. The oldest Independent chapel was built in 1819. Other denominations entered later, the places of worship in Manchester having probably been found sufficient for their needs. St. John's Roman Catholic Church, the cathedral church of the Salford diocese, was opened in 1855. The borough now contains a large number of handsome buildings devoted to religious uses, almost every denomination being represented—a striking contrast to the ecclesiastical aspect of the place in the days of Humphrey Booth, when a single edifice of moderate size was the only provision made, apart from the parish church, for the church-going wants of the entire population.

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GASHOLDER CONSTRUCTION.*

GASHOLDER construction is far from being an exact science. It seems still to be in an experimental stage; there are no standard lines or data to be carefully adhered to as in the construction of roofs and bridges. These latter are built to suit the purpose for which they are required with sufficient strength and without waste of material. Can this be said of the large gasholders of the present day? Judging by the diversity of design displayed this must be answered in the negative.

In a search for economy in gasholder construction, the first and largest item that catches the attention is that of exterior support; its cost is generally from 30 to 50 per cent. of the total expenditure, without contributing a single foot to the storage capacity on the works.

Let us look for a moment at the nature of the support supplied to keep the floating vessel of a gasholder in a level position. When a gasholder was the simple thing as at the beginning of this century, it mattered little if the few short posts used were much more substantial than necessary; it is now a very different matter in the case of a modern gasholder, containing as many thousands as the former did hundreds of cubic feet. When a vessel of great size, rising to a height of 150 or 200 feet, has to be surrounded with twenty or thirty posts of a similar height, the question as to what constitutes a safe and economical support is a matter of great importance, and on this point there is great diversity of opinion.

Marked contrasts in design are frequently met with in holders of about the same size. The following are one or two examples:—

No. 1 Holder.

3 lifts, 150 feet by 30 feet, weight of columns	553 tons.
" " girders	159 "
Total	712 "

No. 2 Holder.

3 lifts, 150 feet by 30 feet 6 inches, weight of columns	198 tons.
" " girders	66 "
Total	264 "

No. 3 Holder.

3 lifts, 150 feet by 30 feet, weight of wrought-iron standards and girders	128 tons.
--	-----------

* A paper read by Mr. E. Lloyd-Pease, at the Society of Engineers.

This contrast forces upon the mind the observation that if the last-mentioned design is safe, the former designs are wasteful. From want of evidence to the contrary, it must be taken that the light lattice standards are strong enough.

From the fact that very light standards are seen to successfully do the work required of them round a large gasholder, the question arises whether the higher portions of them are of any value at all, or are ever called upon to bear an appreciable strain? And also, whether the inflated cylinder of iron that they enclose, held rigidly by the lower portions of the standards, and incapable of the slightest bending or vibration, is not infinitely stiffer than the higher portions of the standards, and in reality (from its own inherent strength) as immovable as a rock, when the lower portions of the standards are of sufficient strength?

There are other details, however, that have some importance. Many large holders that have worked with great regularity for a long period have crown carriages of the very simplest design and, in comparison to some modern carriages, of the very lightest description. There is a fashion in these things, and at the risk of hazarding a suggestion that may be questioned, it would almost appear that the use of tangential and radial rollers in carriages on the upper lifts has spread from their use in the large holders of the South Metropolitan Gas Company. If they are necessary, or their use justified on such exceptionally large holders, which in themselves struck out into a new line, can they be considered to be necessary in holders not half the size, when past experience has abundantly shown that very simple and almost fragile carriages are sufficient? If they are not necessary, their use is a mistake, seeing that they are, in proportion to their weight, by far the most costly part of a gasholder.

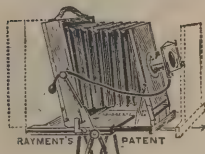
The use of tangential rollers on the outer lift, when one or more lifts rise above the columns, is quite another matter, since the question of leverage of the wind presents itself.

These two points, the massiveness of the exterior supports and the construction of the carriages that bear upon them, with the number and strength of the vertical stays in the holder body (and perhaps there ought to be added the weight of the top curb), are all points in which there is great divergence in practice. There is no finality in the existing information on these points.

It is just possible that some surprising facts would come to light, if a careful investigation were carried out as to what is proved to be actually sufficient in various existing holders in the four points just referred to. The collection of designs thus

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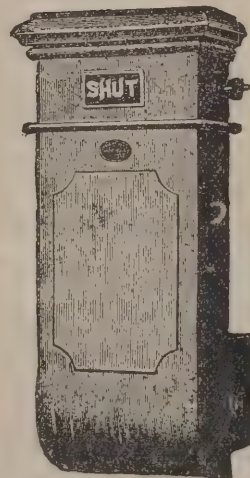
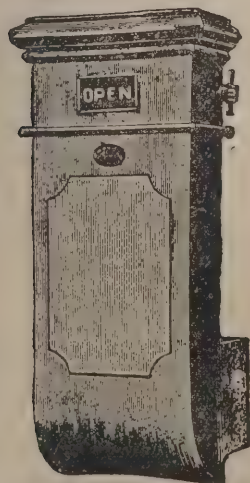
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formed, if selected in parts and placed together to form one holder, might lead to a standard design—light, simple and cheap. This paper, however, attempts to approach the question of how far the construction of a holder can be cheapened and simplified from other considerations.

The Use of Columns.

It goes almost without saying that the usual custom of providing columns to the full height of the holder is founded on the belief that the holder when fully inflated is not in itself sufficiently strong to resist the force of the wind. Possibly this has to some extent been led up to by the fact that holders have invariably been contained in excavated tanks and counterbalanced, in which case columns have to be provided to support the counterbalance. If it had not been so, and iron tanks on the surface had been used, it would very early have been found that the supporting arrangement of three ropes connected to one weight, even if the ropes were attached to the bottom curb, supplied all the support required, and that the holder itself was abundantly strong and stiff without assistance from any columns.

If, then, the problem of gasholder building had developed from the premises that small holders were sufficiently strong, instead of from premises that columns, whilst carrying the balance-weights, were also necessary for the support of the holder, there would not now be the very strong prejudice in favour of columns the full height of the holder that is so widely spread.

Seeing that the largest gasholder ever constructed has two lifts without external guide framing, and many smaller holders have been built without columns of any description, the fact that guide framing is, to some extent, superfluous has been demonstrated without doubt. But this fact is not generally acknowledged and acted up to so as to have become trite and uninteresting.

In the opinion commonly prevailing, the function of columns divides itself into two—that of preventing distortion and of preventing overturning. If they are not needed for the former case, they need only be built to meet the second demand upon them—that is to say, if a gasholder will keep its form, columns are only required to such a height as would prevent overturning. There are three factors that lend weight to the theory that the gasholder requires little, if any, exterior support.

In the first place, the weight of the sides suspended from the top curb places the side sheeting in tension, and this is at

its maximum at the top and runs out to nothing at the bottom curb. At the bottom of the second lift, in a three-lift gasholder for example, it exists to the extent induced by the weight of the outer lift.

In the second place, gasholders are by no means structurally devoid of power to resist the pressure of the wind, for it must be remembered that they are more than able, as far as each of their lifts is concerned, to bear their own weight without distortion, as is shown by the fact of their standing on the tank resting-stones before inflation. This structural strength may certainly be estimated as being in reserve, for when inflated and suspended in a normal condition, their powers in this direction are quite untaxed.

In the third place, inflation itself creates considerable additional stability in the holder.

In considering the question of the ability of the "free" lifts or lift of a telescopic holder to withstand wind-pressure without distortion, the strength imparted by all three factors before mentioned has to be estimated.

In a case in which exterior support is discarded altogether, the tension in the sides induced by the hanging weight ceases to be a valuable factor, seeing that it practically does not exist where the light sheeting begins just above the bottom curb, and which is presumably where buckling would first of all show itself, because (if the expression may be allowed) it is not in this position pulling at anything, and therefore not taut. In the following remarks an attempt is made to estimate the ability of a three-lift gasholder, 180 feet diameter by 30 feet deep, to resist the pressure of the wind when—

1. Supplied with outside support to the height of one lift.
2. Without any exterior support.

The wind-pressure of a 40 lbs. per square foot gale against the windward surface of the two upper lifts may be taken to be—

$$\frac{180 \times 60 \times 40}{2} = \text{say, } 97 \text{ tons.}$$

The question of parallelism of the holder need not come into question here; it is presumably secured by the weight and strength of that portion of the holder within the columns working of necessity with a horizontal movement. Whether other means besides the use of ordinary rollers and carriages can be with advantage adopted will be referred to later in this paper.

The outer lift of a 180-feet holder may be taken to weigh about 90 tons. This is supported by the inner and second lifts. The lower part of the second lift, that just rising above

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the columns, is in vertical tension to the extent of 90 tons, *i.e.* to the amount of the weight of the outer lift hanging upon it. The outer lift is essentially horizontal. Owing to its position within the columns, and its weight being distributed round the entire circle of the inner lift, there is obviously a strong tendency for the sides to maintain a vertical position, and for the crown of the holder to be horizontal and parallel with the outer lift.

The model c has been constructed to represent this point. The model represents a three-lift holder, 180 feet by 30 feet each lift. The two inner lifts are constructed of silk only, without any vertical stiffeners; the outer lift is made of tin of such a weight as to give approximately the same water-pressure as the outer lift of such a holder, *viz.* 2½ inches. Any stiffness displayed by the two inner lifts is entirely due to the fact that they form the connecting link between the horizontal hanging weight of the outer lift and the vertical support of the gas. The holder can only be bent or distorted about the bottom part of its second lift by a force sufficient to overcome the vertical tendency of the gas and bend it about the same point, the lower third of the gas being unaffected. There is an elasticity and springiness in a column of gas confined under these conditions, when the lower portion is confined in a heavy and horizontal vessel, sufficient to transform by inflation the most flimsy material into a substantial structure.

It may be argued, therefore, that there is considerable stability given to the "free" lifts of a holder by the column of gas they contain. Being vertical in itself, and held, as it were, as to a third of its height in a vertical position, it supports the vessel by which it is confined.

It is now necessary to consider the strength that the shell of a holder may possess as an iron structure in forming an estimate of the ability of the lifts rising above the guide framing to resist the force of the wind.

It has been mentioned that the sides of a holder whilst at rest, and standing on the resting-stones in the tank, exhibits no signs of distortion in that portion of the sides that joins on to the strong plates of the cup, and that supports approximately the whole of the crushing weight of the sides. It is evident from this that the sides of the holder have at least this amount of structural strength, a strength that is not drawn upon when the holder is inflated and hanging suspended, in contradistinction to standing on the resting-stones.

The second lift of the holder, taken as an example, weighs about 80 tons. As the ability to withstand a crushing force

equal to this weight still exists when the holder is inflated, it must be taken into consideration when estimating the ability of the holder to offer resistance to the distorting power of the wind. Although this second lift is a structure capable of sustaining a weight of 80 tons, the actual conditions under which it exists in normal circumstances are such that in place of being subjected to compression it is really in tension to about the same amount, owing to its own suspension and the weight of the outer holder (90 tons) hanging upon it.

The lowest portion of the light sheeting of the second lift, consisting of ⅜-inch sheets, may be considered to be the first point at which buckling or crumpling would make its appearance; this, however, cannot take place until the vertical tension of 90 tons and the latent strength of the sides of 80 tons has been overcome—together equal to 170 tons. The wind-pressure of a 40 lbs. per square foot gale on the inner and second lifts is taken to be 48 tons and 49 tons respectively. That of the inner lift is taken to be applied at the dip of the second lift owing to the holder being a jointed structure. The two forces combined produce at the distance shown of 91 feet 6 inches an induced strain of 24 tons, acting downwards as shown by the right-hand arrow. Against this 24 tons is to be placed one-half of the 170 tons of the combined resistances, *i.e.* 85 tons against 24.

The conclusion pointed to by these figures is that whilst buckling tendency on the lee side of the holder may be taken at 24 tons, the force tending to keep them straight and vertical owing to the tension induced by the outer lift is as much as 45 tons—that is, half the weight of the suspended outer lift.

Thus the first of the two factors is in itself more than sufficient to resist the power of the wind, the structural strength of the holder remaining in reserve.

Besides these two there is a third factor, *viz.* the strength imparted to the whole structure by the rigidity of the sheeting when inflated.

The sides of a gasholder are, as is well known, constructed with strong vertical stays, frequently of channel iron, connecting the plates at the top and at the bottom of each lift used in the construction of cups and dips or top and bottom curbs. The sheeting which is placed on the outside is frequently not attached to the stays. In an uninflated condition the sheeting adds little to the strength of the shell, but the reverse appears to be the case when gas at considerable pressure is confined within. For the lee side of a gasholder to assume a convex form (in elevation) the formation of corrugations in the side

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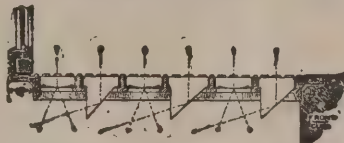
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sheeting is essential—that is to say, the iron necessary for the bulging or leaning over of the lee side can only be obtained by a flattening of the sides of the holder.

If the top part of the second lift be considered to be forced over to the right by the great power of the wind, the sheeting would be found to be drawn into corrugations as suggested in the sketch. The vertical stays on the lee side are greatly supported by the sheeting. The stays are attached at the top to the strong plates of the dip, to which the sheeting is also attached. In order to depart from the vertical, the stays through the heavy plating must drag upon a large area of sheeting. The sheeting on both sides of the holder, in order to admit of this movement, must, leaving its semicircular form, become flattened, and assume that of chords of arcs. This is prevented by the verticals, and also by the support given by the gas. Whilst the former provides that no vertical contraction in the sides takes place, or any flattening in their immediate neighbourhood, it is the gas pressure within that renders the whole rigid, and so struts out the sides that they form a very efficient backstay to the leeside verticals. The centre post and back legs of a derrick crane seem to be to some extent a parallel. The strength of the inflated side sheeting, together with the two factors dealt with previously, appear to make up a very effective trio, interacting one with the other.

Holdings without Exterior Framing.

No tension exists in the lower portion of the side of the outer lift of a holder, so that this cannot be relied upon, as in the case when the second lift was being considered.

In the case of the outer lift, the ability to withstand the wind strain depends on the structural strength of the lift, and the rigidity imparted to it by the inflated sheeting.

It will be seen that the wind-pressure is taken to be 97 tons at 30 feet from the ground, and 50 tons at 15 feet, and the induced compression at X as 40 tons. In a gasholder of ordinary construction of this size, there would be about 40 vertical stays of 6 by 3 by $\frac{1}{2}$ -inch channel iron; each may be estimated to be capable of resisting a vertical compression of 19 tons. Taking the twenty verticals on the lee side as effective at X, there is a total effective resistance 380 tons.

As suggested in the foregoing remarks, the side sheeting ties back the verticals, and prevents them bending about the bottom curb to which they are fixed, and in this position they have the very great vertical resistance mentioned above. The factor of safety of nine to one, shown by these figures

(40—380 tons), leaves a margin for reduction on the score of too high an estimate of the efficiency of the channel iron verticals. There is absolute proof that the outer lift, being able to sustain its own weight of 90 tons, is at least able to sustain a crushing force of 45 tons on the lee side, which in itself is 5 tons more than the estimated induced compression of the wind. There is, therefore, a sufficiency of strength by relying only on that absolutely shown to exist, and without the support of any estimate, however sound. Unless these arguments are altogether fallacious, there is a large margin of strength in an ordinarily constructed 180 feet diameter holder to withstand a gale of wind, without calling upon outside assistance to prevent distortion.

The Employment of Steel Ropes.

There is no doubt whatever but that a well-designed gas-holder needs no exterior aids to enable it to withstand the force of the wind, except that which is necessary to keep it in its working position. The vertical rise and fall has been usually secured by the use of columns. This is a very expensive method, the cost of these in lofty holders being a large percentage of the total cost. By doing without columns or wrought-iron standards, and arranging that the wind strain on the upper portion of the holder shall be transmitted through the holder itself to the ground line, a great saving in cost must obviously be effected.

How this is secured by means of steel ropes will now be briefly described. It must be noticed that three is the smallest number of ropes that suffices to produce parallel movement in a holder. One rope, as shown, checks irregular movement in one direction only. It will be seen that the rope is fixed to a bracket A on the tank, passes over pulleys B and C on the crown, under D on the bottom of the holder, and up to E on the tank where it is fixed; the rope is not fixed to the holder, the holder is perfectly free to move within the rope. If the holder be regarded as gradually sinking it will be clear that since D C and C B are fixed distances, D E and A B are the only variable distances, and that it is impossible for D E to increase to a greater amount than A B diminishes.

The result of a gale of wind, as suggested by the arrow, is a tendency for both E D and A B to increase at the same time; as this is an impossibility the holder will remain upright as long as the rope holds.

If the circumference of the holder be divided into three equal portions by three ropes trained as this one, it is impos-

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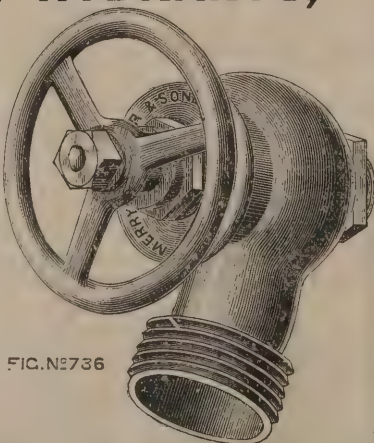


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sible for the holder under any circumstances to rise or fall irregularly.

Model D shows a section of a holder, exhibiting the working of two ropes. This simple arrangement, viz. that of rope control, has been used with the greatest success in numerous instances, the number of ropes used varying according to the size of the holder. In many cases it has been used when it has been desired to add to the number of lifts in a holder without increasing the height of the columns or standards. A great saving in cost is the result from the adoption of this plan.

It may here be stated that there are very many ways of applying the rope system, the details of which are unimportant at the moment. The rope shown is fixed to a bracket at A, passes over B and C, under D on the inner lift, over E on the dip of the outer lift, under F on the bottom curb, and up to G, where it is fixed.

Whilst the holder descends, and until the outer lift lodges in the tank, the only two variable distances are F G and A B, and since the former can increase only to the extent that the latter, A B, diminishes, the holder cannot tilt over in the direction of G. As soon as the inner lift sinks within the outer, D E and A B are the varying distances, and there is the same inability as before on the part of D E to increase to a greater extent than rope is set at liberty by the approach together of A B. As in the former case, three ropes will theoretically suffice to keep the holder vertical, though in practice more are employed in proportion to the size of the holder and the amount of wind-pressure to be resisted.

Model C shows four ropes on a two-lift holder. The function of the ropes is to equalise the balance between the two sides of the holder, the lee and windward sides. The balance on being disturbed by the wind is at once readjusted by the rope on the lee side; it carries some of the overplus of weight, and transfers it to the windward, where weight is required to counterbalance the upheaving of the wind. As an interesting point only, and not because it has any value in actual practice, it is proposed to shortly examine the supporting power of a single rope. In the first place, the training of the rope enables it to do duty up to double its strength.

The training of the rope is precisely the same as that already shown, with the modification that the ends are attached to weights in place of brackets. A point is indicated in the interior of the holder as that about which movement would take place. On the left side is a downward force of 36 tons—this is exactly balanced by the two hanging weights of 18 tons

each; therefore, although the work done in supporting the holder is 36 tons, the strain on the rope is but 18 tons.

Applying this to an actual holder it will be found that the 180 feet by 90 feet holder that has been taken as an example requires, under the pressure of a 40 lbs. per square foot gale, support to the amount of 36 tons. It would require therefore a holder of this great size to strain nearly to breaking point one ordinary $\frac{3}{4}$ -inch steel rope. This is merely given as an illustration of the power available in steel ropes in supplying the necessary support to large holders. In actual practice such a holder would be supported by, say, eighteen $\frac{3}{4}$ -inch ropes. Contraction and expansion of the rope is arranged for by the use of compression springs placed on the holding brackets to which the ends of the rope are attached.

These details in connection with the rope system may appear somewhat out of place in a paper that commenced with a criticism of the cost of modern holders, but perhaps they can claim admittance on the ground that the support of the holder is a very large item in the cost, and that the economy of using new means or the wastefulness of the old cannot be estimated until the new method has substantiated its claims.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the ordinary meeting of this Society a paper was read by Mr. R. Nelson Boyd, M.I.C.E., &c., on "Liquid Fuel in the Future." The author began by referring to the use of hydrocarbons or liquid fuel in the past, which were first introduced after the early development of petroleum in America in 1859. Several patents were taken out in this country for the application of liquid fuel as far back as 1863. The most successful general application of liquid fuel was made by Mr. Urquhart in South Russia. Mr. Holden has recently adopted liquid fuel on the Great Eastern Railway. The calorific value of petroleum was discussed, and divers authors and results cited, from which it appears that practically one ton of petroleum residue is equal to nearly two tons of coal. The advantages in the use of petroleum were then referred to, and amongst these were economy of stoking on board ship and ease of working on locomotives. The results obtained on the Great Eastern Railway, and the account of a steamer using petroleum residue only on a long journey across the Pacific Ocean, were given in some detail. Reference was made to the present and future use of hydrocarbons as liquid fuel; the oil-engine was cited, and its applications to

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mining and other purposes. The advantages were pointed out which the oil-engine possesses over steam-engines in the economy of space and first cost, and over gas-engines in its applicability in situations remote from gas-works. Some reference was also made to the increasing use of petroleum for domestic purposes, that is, in cooking-stoves in place of coal or gas in small households. The paper ended by a reference to the supply and cost of liquid fuel, pointing out that at present the supply to this country was entirely derived from two foreign countries, namely, the United States of America and Russia. Under these circumstances the author was of opinion that it would not be wise to adopt petroleum as a fuel for the Royal Navy, and that although the supply of illuminating oil was adequate and the prices reasonable, the quantity available when considered as fuel was very small as compared with the consumption of coal. The conclusions of the author were that, although the problem of the applicability of liquid fuel had been solved, there remained the serious considerations of a large and constant supply at a sufficiently low cost to compete with coal.

ST. PAUL'S, PENZANCE.

THE enlargement of St. Paul's Church, Penzance, has been completed, and the church reopened. The original church, which was built from the plans of Dr. Hocking in 1843 for the Rev. Henry Batten, the founder, was of Early English architecture, or that style which prevailed between the period from 1230 to 1260. It was in the form of a cross, 60 feet in length, 22 feet in width, and about 56 feet in height from the floor to the apex of the roof. Alterations and additions have from time to time been made in the fabric and fittings, and several attempts made to enlarge it. The present enlargement consists of a reproduction of the 1843 church; the north wall and north transept have been taken down, and the roof of the old church taken up and supported by massive granite columns, with a bold but exceedingly elegant moulded cap with arch stone, and the effect on entering the building is impressive. New three-light windows have been placed in each of the eastern and western gable ends. The new serpentine font given by the Coulson family has been placed near the north porch door. The chancel has been enlarged, additional accommodation made for the choir, and the lectern removed from the front of the chancel steps to near, and in front of, the pulpit. The new stall for the vicar has been presented by the choirmaster,

Mr. Stephen White. Additional sitting accommodation for 160 persons is provided for in the enlargement; special attention has been given to the provision of proper accommodation for the Sunday scholars, and in the north gable end an entrance has been provided for them from the school buildings. The house and premises at the north of the building have been acquired by the officers and will be fitted up as clergy and choir vestries. The cost of the enlargement has been about 1,600*l.*, and the work has been carried out by Mr. W. H. Stephens, of Penzance, from the plans of Mr. J. W. Trounson, F.R.I.B.A., of Penzance.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 6563. George Henry Couch, for "Improvements in ordinary window-frames, with sliding sashes and fittings thereof."
- 6580. Leonard Poilvache, for "Improvements in automatic door-closing apparatus."
- 6505. Rowland Pennington, for "Improvements in or connected with windows."
- 6664. George Henry Couch, for "Improvements in window-frames and sashes and fittings thereof."
- 6746. Henry Harris Lake, for "An improved safety-hasp."
- 6764. William Nicol, for "Improvements in and relating to windows and the like."
- 6775. Herbert F. Harcourt, for "Window-sash fastener."
- 6846. Francis Richard Lowson, for "Improvements in and relating to architects' set squares."
- 6854. Samuel Easthope, for "Improvements in the construction of split loose-pulleys."
- 6870. James Pride, for "Improvements in the construction of split loose-pulleys."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

COCKINGTON.—May 1.—Plans are invited for New Church. Rev. T. S. Rundle, Cockington, Torquay.

LANCASTER.—May 1.—Competitive Drawings invited for Extension of Markets, and Erection of a New Hotel. Mr. John Cook, A.M.I.C.E., Town Hall, Lancaster.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

LONDONDERRY.—May 1.—Plans are invited for proposed Baths and Washhouses. Mr. Robert N. Chambers, Guildhall, Londonderry.

CONTRACTS OPEN.

ABERDEEN.—May 1.—For Additions to University Buildings, King's College. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

ALSAGER.—May 2.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

BOLLINGTON.—April 30.—For Putting-down Borehole. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

BRISTOL.—April 30.—For Building Board School. Mr. F. Bligh Bond, Architect, Liverpool Chambers, Corn Street, Bristol.

BURGHCLERE.—May 1.—For Rebuilding Chapel. Mr. J. T. Stead, 30 Bartholomew Street, Newbury.

CAERPHILLY.—May 2.—For Building Chapel. Mr. J. H. Phillips, Architect, St. John's Chambers, Cardiff.

CALDICOT.—April 28.—For Additions to Schools. Mr. F. R. Bates, Architect, 4 Commercial Street, Newport, Mon.

CARLTON.—May 9.—For Building Board School for Infants. Messrs. Senior & Clegg, Architects, 15 Regent Street, Barnsley.

CHELTENHAM.—May 2.—For External Fire-Escape Stairs at the Workhouse, and other Works. Mr. J. T. Darby, Architect, Tavistock Place, Cheltenham.


CHESHUNT.—May 5.—For Drainage and Water-Supply Works to Six Villas. Mr. James Bunce, Turner's Hill, Cheshunt, N.

CLAY CROSS.—May 8.—For Building Board Schools. Messrs. Rollinson & Son, Architects, 13 Corporation Street, Chesterfield.

CLAYTON.—May 5.—For Building Eight Scullery Houses. Mr. Sam Spencer, Architect, 344 Great Horton Road, Great Horton.

COCKERMOUTH.—May 1.—For Erection of Purifier House and other Buildings at the Gasworks. Mr. E. W. Smith, Gas Manager.

CORK.—May 2.—For Building Chapel and House of Retreat. Mr. S. F. Hynes, Architect, 41 South Mall, Cork.



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DARLINGTON.—May 9.—For Stations and Buildings for Railway Extension. Mr. Ernest E. Meek, Secretary, Darlington.

DUBLIN.—May 7.—For Additions to Institution for Imbeciles, Palmerstown. Mr. G. P. Beater, Architect, 17 Lower Sackville Street, Dublin.

DOWLAIS.—May 5.—For Building Church, Pengarnddu, and at Pontclown. Mr. E. M. B. Vaughan, Architect, Cardiff.

ECCLES.—April 30.—For Construction of Boiler House, Engine and Pump House, Chimney and other Buildings at Sewage Farm. Mr. H. L. Hinnell, Engineer, 15 Mawdsley Street, Bolton.

FARNHAM.—For Additions to Grammar School. Mr. Paxton Watson, Architect, Farnham.

GILFACH-FARGOED.—April 30.—For Building Sixteen to Twenty Cottages. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

GODALMING.—May 7.—For Building Technical and Art School. Mr. Samuel Welman, Borough Surveyor.

GREAT YARMOUTH.—April 30.—For Works at Board School. Messrs. Bottle & Olley, Architects, Regent Street, Great Yarmouth.

GUILDFORD.—April 28.—For Constructing Pavilion on Sports Ground. Mr. A. J. Sturges, Architect, High Street Chambers, Guildford.

HASTINGS.—May 1.—For Additions to Board Schools, Mount Pleasant. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HUNSTANTON.—May 10.—For Building Detached Residence. Messrs. George Fill & Co., Architects, 1 Queen Street, Norwich.

LAKENHAM.—May 5.—For Building Four Dwelling-houses. Messrs. George Fill & Co., Architects, 1 Queen Street, Norwich.

LEEDS.—April 28.—For Building Two Houses. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

LEICESTER.—May 1.—For Pavilion for Bowling Green. Mr. E. G. Mawbey, Borough Surveyor.

LLANELLY.—April 30.—For Building Board School for Infants. Mr. J. B. Morgan, Architect, Llanelly.

MARYPORT.—April 27.—For Building Five Houses. Mr. C. Eaglesfield, Architect, Maryport.

MORLEY.—May 2.—For Building Mill Premises and Chimney. Mr. G. B. Clegg, Architect, Morley.

NEWBURY.—May 7.—For Construction of Cattle Shed. Mr. E. A. Strickland, Borough Surveyor.

NEWCASTLE.—April 27.—For Police Station. Messrs. Marshall & Dick, 4 Northumberland Street, Newcastle-on-Tyne.

NEWCASTLE.—May 3.—For Constructing Bridge, &c. The County Surveyor, Moot Hall, Newcastle-on-Tyne.

NOTTINGHAM.—April 30.—For Building Police Station, &c. Mr. Arthur Brown, Borough Engineer.

OULTON BROAD.—May 5.—For Building Temperance Hotel and Boarding House. Messrs. George Fitt & Co., Architects, 1 Queen Street, Norwich.

OXFORD.—April 28.—For Alterations to 3 Avenue, Meat Market. Mr. J. J. Bickerton, Town Clerk.

PONTYCWMMER.—May 2.—For Additions to Board Schools. Mr. Philip J. Thomas, Architect, Bridgend.

READING.—May 1.—For Widening and Reconstructing Two Bridges, also New Bridge and Subway near Railway Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

SELBY.—May 1.—For Building Thirty-three Cottages. Messrs. Todd & Thorp, Land of Green Ginger, Hull.

SHEFFIELD.—April 28.—For Building Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SHEFFIELD.—May 2.—For Construction of Public Baths. Mr. C. F. Wike, City Surveyor, Bower Spring, Sheffield.

SHEFFIELD.—May 4.—For Building Board School, Bole Hill. Mr. W. J. Hale, Architect, 13 St. James Row, Sheffield.

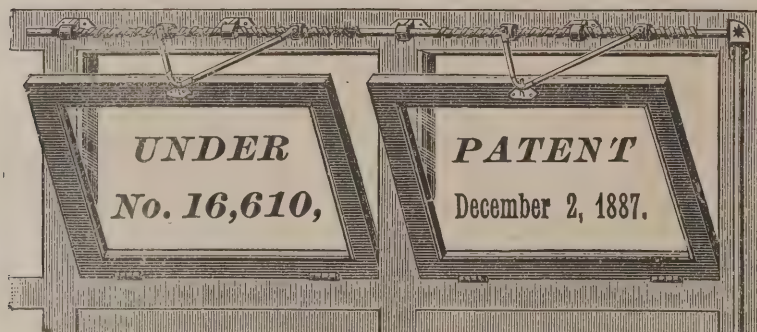
SHIBDEN.—May 1.—For Building Manager's House, &c., at Sewage Disposal Works. Mr. John Drake, Winterbank, Queensbury.

STANNINGLEY.—May 7.—For Building House and Premises. Mr. H. Hodgson, Architect, 27 Kirkgate, Bradford.

SWANSEA.—May 22.—For Building Board School. Mr. G. E. T. Laurence, Architect, 181 Queen Victoria Street, E.C.

SWINTON.—April 30.—For Additions to Board Schools. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

THURSO.—April 30.—For Building Hospital. Mr. James Brims, County Clerk, Thurso.



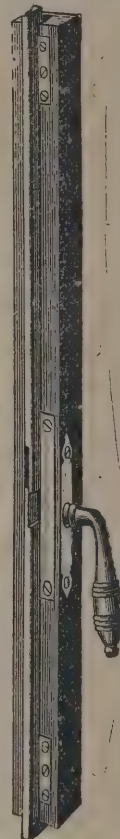
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WATERLOO.—May 14.—For Additions to Town Hall. Mr. F. Spencer Yates, Surveyor to the Local Board, Town Hall, Waterloo.

WHICKHAM.—May 2.—For Building Board School and Teacher's House. Mr. T. C. Nicholson, Architect, Blaydon-on-Tyne.

WILLINGTON.—May 1.—For Rebuilding Pit Laddie Hotel. Mr. Cook, 59 Sadler Street, Durham.

YORK.—April 28.—For Building Two Semi-detached Villas, Upper Poppleton. Mr. Wm. Hepper, Architect, 4 Spurriergate, York.

IMPORTANT SALE OF LAND.

WE understand that Messrs. Debenham, Tewson, Farmer & Bridgewater will sell, at the Mart, on Tuesday, May 22, at 2 o'clock, the 55 acres of freehold building estate situate at Black Rock, in the parish of Rottingdean, just beyond Brighton borough boundary. The property possesses a frontage of about 3,135 feet to the main road leading from Brighton to Rottingdean, and is also intersected by the old turnpike road to Rottingdean, to which it possesses about the same frontage. The Brighton main sewer and the Corporation's water mains are laid throughout the length of the latter road. The land is especially adapted for the erection of moderate-sized detached and semi-detached residences, with gardens sufficiently large to allow of lawn-tennis, a class of house which it is almost impossible to find in Brighton, and much needed. The local rates are exceptionally low, being about one-third of the Brighton borough rates. The beautiful Downs in the rear of the estate afford delightful walks and rides, and there are golf links within a few minutes' walk. Great improvements have recently been effected at this end of Brighton, amongst others the extension of the well-known Madeira drive, which is within five minutes' walk of the property. The electric railway runs along the Undercliff to the same point, and is being extended past the estate to Rottingdean. There is a good omnibus service to all parts of Brighton.

At Ayr Mr. Hammond, electrical engineer, London, has just made a survey of the burgh with a view to the introduction of the electric light, and will submit a report to the Town Council.

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Wilkinson Bros., London	9,000	0	0
V. P. Freeman, Brighton	8,820	0	0
Playfair & Toole, Southampton	7,547	0	0
J. Longley & Co., Crawley	7,459	0	0
G. Lawson, Glasgow	6,530	0	0
B. COOKE & Co., Battersea (accepted)	5,900	0	0
J. Dickson, St. Albans	4,707	10	2

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S. & E. Bentley	19,491	0	0
S. Pearson & Son	12,800	0	0
Wilkinson Bros.	11,500	0	0
Pethick Bros.	9,954	0	0
V. P. Freeman	9,520	0	0
A. Kellett	8,992	0	0
J. Longley & Co.	7,789	0	0
J. Dickson	7,271	11	5
Playfair & Toole	7,164	0	0
B. COOKE & Co. (accepted)	6,500	0	0
G. Lawson	6,400	0	0

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S. & E. Bentley	35,362	0	0
S. Pearson & Son	35,000	0	0
G. Lawson	33,925	0	0
J. Longley & Co.	29,875	0	0
A. Kellett	28,540	0	0
Wilkinson Bros.	27,470	0	0
J. Dickson	26,429	0	0
Playfair & Toole	23,800	0	0
B. COOKE & Co. (accepted)	21,477	0	0

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J. Whiteham, Hull	548	0	0
W. ROBINSON, Bridlington (accepted)	440	17	0

BRISTOL.

For Building Schools at Fishponds, Bristol, in Connection with the Diocesan College. Mr. WILLIAM N. GOUGH, Architect, Bristol.

Brock & Son, Bristol	£2,585	0	0
Cowlin & Son, Bristol	2,473	0	0
W. Church, Bristol	2,389	0	0
A. J. Blaven, Bristol	2,350	0	0
Forse, Bristol	2,350	0	0
J. E. Davis, Bristol	2,320	0	0
J. Bastow, Bristol	2,310	0	0
Eastabrook, Bristol	2,275	0	0
E. Walters, Bristol	2,200	0	0
G. Humphreys, Bristol	2,189	0	0
Hatherley & Carr, Bristol	2,187	0	0
Browning, Fishponds	2,167	0	0
G. Downs, Bristol	2,076	0	0
H. J. ROSSITER, Bristol (accepted)	2,048	0	0

BROMLEY.

For the Erection of a Church and Adjoining Buildings in Free-lands Road, Bromley, Kent, for the Presbyterian Church of England. Mr. JOHN C. T. MURRAY, Architect, 13 Queen Anne's Gate, Westminster, S.W. Quantities by Messrs. W. H. BARBER & SON, Surveyors, 22 Buckingham Street, Strand, W.C.

D. Charteris, Westminster	£9,679	0	0
Higgs & Hill, Lambeth	9,644	0	0
Holloway Bros., Battersea	9,048	0	0
W. Johnson & Co., Wandsworth	8,986	0	0
J. Longley & Co., Crawley	8,973	0	0
S. J. Jerrard, Lewisham	8,933	0	0
T. Crossley & Son, Bromley	8,780	0	0
Duncan Stewart, Wallington	8,348	0	0
John Bentley, Waltham Abbey	8,171	0	0

CAMBORNE.

For Furniture for the Basset Road Board Schools, Camborne.

Wake & Dean	£171	12	6
T. Symons	170	0	0
J. Berriman	165	0	0
Educational Supply Company	164	17	6
H. Walmsley	160	0	0
Illingworth, Ingham & Co.	142	0	0
J. PENGILLY (accepted)	128	10	0

CHIPPING NORTON.

For Concrete Tank for Water Supply to Town. Mr. G. F. MACE, Borough Surveyor.

G. H. Wheeler, Abingdon	£759	0	0
J. S. Kimberley, Banbury	724	16	3
H. & C. Burden, Chipping Norton	650	0	0
W. Jenkins & Son, Leamington	563	16	8
R. STANTON, Evesham (accepted)	524	0	0

COMPTON GIFFORD.

For Road Works, Compton Gifford. Mr. R. H. WORTH, Surveyor.

Hermitage Road.

J. Shaddock	£455	17	10
W. Shaddock	337	10	4
Paynter & Davy	329	1	0
T. Shaddock	313	6	0
E. Duke	277	4	10
C. L. DUKE (accepted)	270	8	0

Lockyer Road.

J. Shaddock	200	12	8
W. Shaddock	165	3	0
T. Shaddock	150	3	1
Paynter & Davy	146	19	3
E. Duke	128	5	4
C. L. DUKE (accepted)	113	17	1

Connaught Lane.

W. Shaddock	521	18	9
J. Shaddock	515	4	6
Paynter & Davy	435	18	6
Wakeham Bros.	398	11	6
T. Shaddock	386	18	6
C. L. Duke	369	0	0
E. DUKE (accepted)	326	9	2

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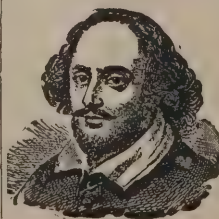
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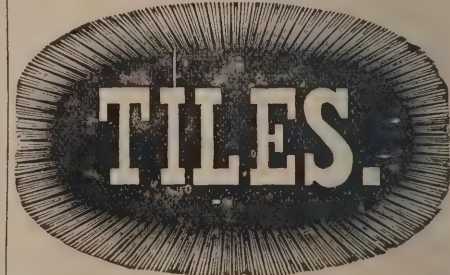
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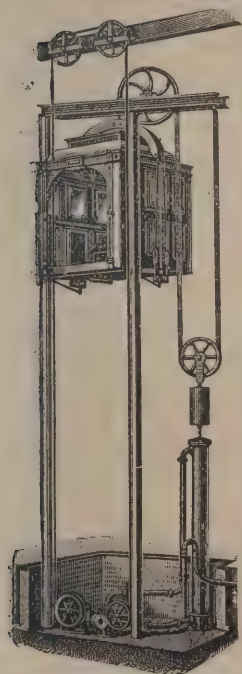
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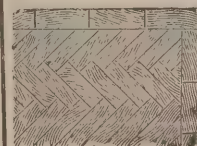
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Foster, Bedford	£1,175	0 0
Warton, Bedford	1,170	0 0
White, Bedford	1,151	0 0
Worrall, Northampton	1,142	0 0
Coleman, Bedford	1,115	0 0
Kemp & Son, Statonbury	1,097	0 0
Corby, Bedford	1,095	0 0
Fathers, Bedford	1,034	0 0
Hawtin, Northampton	1,030	0 0
Wingrove, Northampton	1,027	0 0
Fisher, Northampton	1,020	0 0
Branson & Son, Northampton	1,000	0 0
Heap, Northampton	997	0 0
Martin, Northampton	983	0 0
WOODFORD & SON, Northampton (accepted)	950	0 0

WORKINGTON.

For Building Block of Four Houses, Curwen Street, Workington, for Mr. T. S. Douglas. Mr. JAMES HOWE, Architect, Lorne Terrace, Workington.		
Lister, McCartney & Lister	£1,419	0 0
J. T. Wilson	1,406	13 0
J. Coulthard	1,400	0 0
L. Ferguson	1,335	0 0
J. MURCHIE (accepted)	1,323	10 0
S. McWhinney	1,223	10 0

WORSLEY.

For Villa Residence. Messrs. CAMPBELL & HORSLEY, Architects, Bank Chambers, Eccles.		
Young, Tinker & Young, Manchester	£518	15 0
Rawlinson & Son, Swinton	479	0 0
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Moore & Son, Eccles	464	4 5
W. WARD, Eccles (accepted)	460	0 0

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GODDARD, MASSEY & WARNER, Nottingham (accepted)	£4,161	3 10
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T. Morgan, Penygraig	169	10 0
W. E. Willis, Ystrad Rhondda	169	0 0
J. & T. PARRY, Ystrad Rhondda (accepted)	165	17 10
Architect's estimate	165	0 0

TRADE NOTES.

AT the fourth annual meeting of the Ulster District Council for the National Registration of Plumbers, held at the Belfast Town Hall, the Lord Mayor of Belfast presided, and in moving the adoption of the report said that it was satisfactory to note that the plumbing-work in Belfast had very much improved during the last three or four years, and he thought this was most creditable to the master plumbers and their workmen.

THE Aldershot Waterworks Company, which has for many years past obtained its supply by the coupled tube well system, is now about to erect a new pumping-station to supply the increased demands of the district, and Messrs. Le Grand & Sutcliffe, hydraulic engineers, London, have just completed a 10-inch artesian tube well 320 feet deep. This forms the second of a new series of coupled tube wells, and these two yield a supply of 300,000 gallons per day of ten hours, which will be ample to meet increased requirements.

THE contract for the new Public Hall, Warrington, was let this week to Mr. R. W. Collins, builder, Warrington. The cost will be about 5,000£, and is being defrayed by the gift of that sum by Mr. J. Charlton Parr to the Corporation. The site is near the present Gymnasium, Palmyra Square, and operations are expected to be begun forthwith. Mr. William Owen is the architect.

WE have received a large illustrated price sheet from the Edison & Swan United Electric Light Co., Limited, of 100 Victoria Street, S.W., showing beautifully-designed electroliers, standards, brackets, pendants, hanging lamps, portable lamps, ceiling fixtures, &c. The ornamental character of design is well maintained throughout, and there is something suitable for every requirement or purpose.

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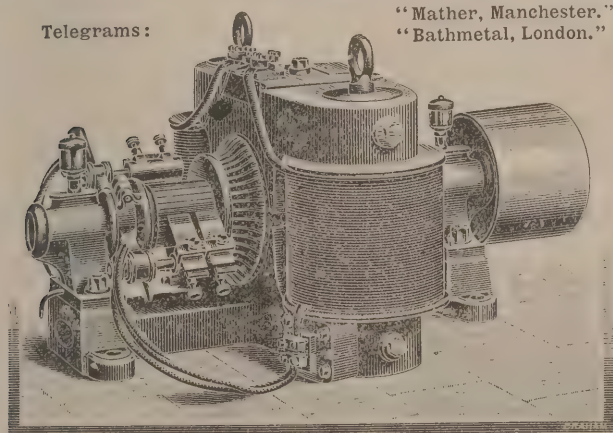
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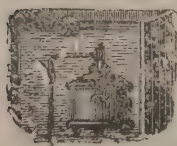
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BUILDING AND BUILDERS.

THE foundation-stone of the cemetery chapel at Hale, Altrincham, where the Altrincham Local Board are expending nearly 10,000 $\frac{1}{2}$., has been laid by Mr. Alderman Griffin, chairman of the cemetery committee. The chapel is being erected from the designs of Mr. W. Owen, A.R.I.B.A., of Manchester, Mr. John Matthews, of Nantwich, being the principal contractor. The new building, which will be entirely faced with stone, is in the Decorated Gothic style of architecture, and will comprise chancel, nave, large mortuary, vestries, &c.

THE inaugural dinner of the Wolverhampton Master Builders' Association took place on Thursday evening at the Star and Garter Hotel, when a numerous company sat down. Mr. Henry Gough occupied the chair, and amongst those present were Councillor Shepherd, Messrs. J. Bradney, T. Jones, T. Perry, B. Guest, G. Cave, W. Myring Skett, J. Jones, Herbert, Swift, Hallchurch, Carding, Hallett, R. Simpkins, and Gough, secretary. An excellent repast having been served, the loyal toasts were honoured in the customary manner. During the evening songs were rendered by Messrs. J. Orme and F. F. Sharpe. Mr. W. J. Bennett acted as accompanist.

At the meeting of the Warwickshire County Council a recommendation of the buildings committee was adopted, "That the plans for the new Petty Sessional Court-house at Nuneaton, police-superintendent's house, constable's house, cells, stabling, and accommodation for the Warwickshire School of Mining, prepared by the county surveyor, be approved, and that the surveyor be instructed to obtain tenders for the works from such builders as Alderman Haddon and Councillors Darlington and Satchell shall direct, to be submitted to the next meeting of the committee," an amendment, that the surveyor be instructed to advertise for tenders for the work, and submit them to the next meeting of the committee, being defeated.

At the meeting of the Partick Dean of Guild Court the following linings were passed:—The Scotstoun Estate Building Company, for the erection of seventeen cottages in Park Drive West, Park Drive South, and a new street fronting the North British Railway; estimated cost about 6,000 $\frac{1}{2}$. James M'Meekin, accountant; James Rankine, wright; W. & G. Kirkwood, plumbers; William Thompson, plasterer; James Foley, slater; and A. & J. M'Ewan, builders, for the erection of twenty self-contained houses in a street to be formed off Crow Road; estimated cost, 10,000 $\frac{1}{2}$.

VARIETIES.

MESSRS. P. & J. BAKER, oriental carpet importers, have removed to 3 Warwick Square, Newgate Street, where they have a splendid assortment of modern and antique carpets, some of the latter being as much as 300 years old.

MESSRS. ROMEIKE & CURTICE say the "Graydon gigantic wheel and recreation towers" that are now in course of construction at Earl's Court are the invention of Lieut. Graydon, and are making great progress under the supervision of the constructor, Mr. Walter Bassett Bassett, of Maudslay, Sons & Field. The foundations are in numerous parts delivered and work going up rapidly as seen from passing trains on the District and Metropolitan Railways.

At the meeting of the Royal Scottish Society of Arts, Mr. R. G. Hislop read a paper on an automatic safety hoist door, the advantage claimed for which was the automatic opening and closing of the intermediate doors by the action of the cage itself.

At the meeting of the Warwickshire County Council, Mr. W. Johnson called attention to the contracts for stone used by the roads and bridges committee, pointing out that whereas the payments for stone to owners in Warwickshire only amounted to 739 $\frac{1}{2}$., the amount paid outside the county was 1,561 $\frac{1}{2}$. He thought they ought, as far as possible, to do what they could for the employers and workmen in Warwickshire by purchasing stone within the county. Mr. C. Vero said that he was quite sure the desire of the committee and the surveyor was to study the interests of the county, and every facility would be given to test Warwickshire stone. If they found that it was suitable and durable, it would be purchased in preference to stone from other counties.

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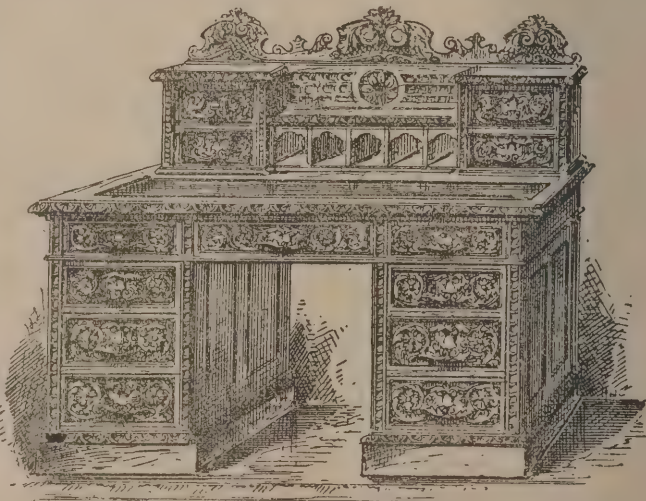
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AMONG the Polytechnic educational holiday tours a students' trip to Paris has been arranged for Whitsuntide, and will be of special advantage to art and architectural students. The party will leave Holborn Viaduct on Friday, May 11, at 8.15 P.M., and travel first saloon on boat and second class rail, *via* Dover and Calais. Three full days will be spent in Paris, and the party will arrive in London at 6 A.M. on Tuesday, the 15th. The fee, including hotel expenses, to bona-fide students of the Polytechnic, will be 2*l.* 10*s.*, and to others 2*l.* 15*s.* When one realises that the ordinary return ticket alone is 3*l.* 8*s.* 6*d.*, some idea is obtained of the special concessions that have been granted.

A SPECIAL fortnight's holiday tour to Lucerne has been arranged for building students and members of any of the art classes. The party will leave London on July 20, and will travel *via* Dover and Ostend, Brussels, and thence to Lucerne. Here the party will remain for one week, visiting all the points of interest in the district. The return journey will be *via* the Falls of the Rhine, by steamer to Cologne, thence to Antwerp for the Exhibition, and home. The party will be accompanied by Mr. C. F. Mitchell, M.S.A., and the fee to Polytechnic students for the fortnight will be 8*l.* 10*s.*

AT the meeting of the Hemsworth Board of Guardians, letters were read from the Public Works Loan Board agreeing to lend the Sanitary Authority 3,200*l.* for the erection of a hospital for the treatment of cases of infectious diseases, 5,000*l.* for Ackworth water supply, and 600*l.* for the extension of the South Kirby sewerage schemes.

THE Leeds Corporation have applied for sanction to borrow 50,000*l.* for the construction of public baths and washhouses, and an inquiry has been held by the Local Government Board.

THE late Mr. John Hill, of St. Margaret's, Streatham, has left a sum of 2,000*l.* for the parish of Newnham-on-Severn. The will directs that the first charge upon the 2,000*l.* is that there shall be provided a clock and chimes for the tower of St. Peter's parish church.

AN inquiry has been held at the Guildhall, Lincoln, into the application of the Town Council for sanction to borrow 27,215*l.* for purposes of street improvement and the formation of a new road, and for works of sewage disposal.

AT the Kersley Local Board Offices an inquiry was held as to the Board's application to borrow 20,000*l.* for works of sewerage and sewage disposal.

AT the meeting of the Aberdeen County Road Board it was agreed that in future contributions from county funds towards

the erection of bridges throughout the county shall only be given when the estimated cost of the bridge reaches 500*l.* It was also agreed that the county contribution shall in no case exceed one-third of the excess above 500*l.*

THE customary Architectural Association students' smoking concert was held at Coleman's Hotel, Covent Garden, on Friday last, April 20. A large number of members mustered on the occasion, and a very pleasant evening was spent under the divided chairmanship of Mr. Cole Adams and Mr. Baggallay, who were supported by Messrs. B. F. Fletcher, A. W. Earle and other visitors. The president, Mr. E. W. Mountford, who was to have presided, was unfortunately prevented from doing so at the last moment, to the regret of all present. An excellent programme was provided by the hon. secretaries, Messrs. E. Graham Simpson and S. Burton Lee, and the students' committee, and many thanks are due to those gentlemen who kindly contributed their services, especially to Mr. C. D. Imhoff, who, to the delight of all who heard him, presided at the piano.

PROGRESS OF ELECTRICITY.

AT the opening meeting of the session of the Institution of Mechanical Engineers, Professor A. B. W. Kennedy, F.R.S., the president, delivered an address on the practical electrical problems of the day. He first dealt with the use of electrical energy for power. As to the transmission of power to a distance, English engineers who wanted to work in this direction would have to study it in other countries. In several towns in the United Kingdom the use of water power for electric lighting would have to be seriously considered some day, but beyond these towns our generation was not likely to see any great development at home. On the other hand, the question of driving tools in a factory by electricity had recently come to the front. In some establishments the saving by the adoption of electricity seemed practically nil; in others, of large size, where no doubt a saving would occur, a considerable amount of capital would have to be spent in making the change. He feared that this would prove a more serious difficulty in the way of the success of the great Niagara scheme than any of those described by Professor Forbes. It was difficult to fix any money value for the convenience of getting rid of the huge mass of shafting, &c., filling the upper half of so many engineers' shops; and the cost of dynamos, leads and motors

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very greatly exceeded that of shafts and gearing. In cases where electrical energy could be obtained from public mains the comparison was quite different, although it was a question at what rate electrical companies—liable, as they were, to sudden increases in the demand for light, especially on foggy London days—could afford to supply power for other purposes. In regard to the driving of trains and tramcars the situation was by no means so favourable to the use of electricity as was sometimes supposed. Only 35 per cent. of the indicated horse-power of an electrical locomotive was available for pulling the train, against 80 per cent. in the case of a steam-engine. Electricity had forced itself upon the City and South London Railway because of its freedom from foul gases, and in the case of the Liverpool Overhead Railway steam was prohibited. On street tramways probably no form of steam car—even under the Serpollet system—would be generally endured. As to methods of getting the electrical current to the cars, overhead wires might be the best way in country districts, but he hoped that our cities would wait till a practicable underground system had been devised. Meanwhile, electricity was being hard pressed by the cable and compressed gas, of which the latter was far the more formidable rival. Dealing next with the question of public electric lighting, the President observed that the points demanded by the public were that the light should not flicker or go out, that it should be available at all hours, and that it should not be below the declared pressure, nor very much above it. The conditions under which such results were obtained were always varying, and were not only extremely complex in any one place, but were also altogether different in different places. After describing some of the more striking variations he had referred to, he said that some of them came most irregularly and without warning, and all of them very greatly affected both the method and cost of production. When a fog came on, sometimes the work to be done might increase in a few minutes by anything from 500 to 1,000 per cent. It was improbable that the fuel consumption per horse-power in electric-light stations could ever reach anything like so low a figure as had often been reached in first-class steamers, where the engines and boilers worked on continuously day and night at pretty much their most economical load. He considered at some length three points relating to the running of a lighting station—security, economy and efficiency of regulation—observing that to some extent the requirements of security and economy were more or less opposed. Dismissing the use of electricity for physico-

chemical processes as outside his own knowledge, he said that nevertheless, from what he did know, he could not doubt that in this direction electricity had a great future. In this section might be included the application of electricity to heating. So many active and competent workers were engaged on this matter that speedy success was greatly to be hoped for. Not only the difficulty of producing the heat, but also that of producing it in a convenient fashion, had been overcome to a very large extent. The commercial difficulty of producing heat cheaply enough to allow of its general use had not yet been overcome, and until that was done electrical heating, unfortunately, hardly came within our ken, except for very special purposes.

PAISLEY DEAN OF GUILD COURT.

At the meeting of this Court, Bailies Fisher and Robertson on the bench, an application was lodged on behalf of Duncan M'Nair, grocer, to take down the existing buildings at 33 Newton Street and 16 Maxwellton Street, and erect a four-storey tenement of dwelling-houses. The master of works, Mr. Moncur, said he had to take objection to the plans, in so far as the air space behind the tenement would not be in accordance with the requirements of the Act. Mr. John Adam, who appeared for Mr. M'Nair, said he wished to point out that the structure proposed to be erected would be a very handsome one, much in advance of the buildings in the district. So far as the objection was concerned, it was the 170th section of the Act which dealt with the case, and it was stated that the air space behind a tenement should be three-fourths of the area on which the tenement stood. Now, from the position of the site of his client, there would be splendid ventilation, and, from the position of ground behind it, there would be plenty of air space for the tenement. The clause stated that the air space behind a property should be "attached thereto," but did not state that it should belong to the proprietor. There might be plenty of space behind a building, and yet all the ground might not belong to the proprietor of the tenement. On the whole, he held that to refuse consent to the plans would be a straining of the clause, which, at its best, was very ambiguous, and he also submitted that a distinction should be drawn between buildings to be erected on a new line of street and the taking down and re-erecting of properties on existing sites. The matter was then postponed.



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NEW PUBLIC BUILDINGS IN KIRKCALDY.

AN extraordinary "boom" in building operations is, says the *Scotsman*, the most outstanding feature in Kirkcaldy industries at present. No less than four important structures of a public nature are either in process of construction or about to be begun, and several new streets and numerous private buildings are also in progress. Nearly all these new erections are situated in the landward part of the burgh, away from what may be called the old town or maritime Kirkcaldy, co-terminous with the sea beach. This latter, however, is still the business quarter, and some new shops and offices are begun, chiefly, as it happens, on the sites of old seventeenth-century houses. Of the four new fabrics of a public character already referred to, the most important, or the largest, at all events, is the Beveridge and Adam Smith Hall and Library, the site for which has been fixed at the junction of Bennoch Road and St. Brycedale Avenue, although the designs are not yet sent in. The second building is intended primarily for the Young Men's Christian Institute, but it will also be commemorative of Provost Swan, a name still held in honourable remembrance in Kirkcaldy. The work is now begun in a prominent position in the centre of the town, with an elevation to the High Street and also to the Kirk Wynd. The plan is by Mr. Washington Browne, and the Institute when completed will have much lightness and elegance, with a dash of picturesque, a prominent feature being a range of windows on the second floor surmounted by gables, which adds largely to the general effect. The internal arrangements include a restaurant in the basement and a billiard-room in the upper storey, the latter a somewhat unusual adjunct to such an institution. The other two structures are directly educational in character—the new high school for Dr. Scott, built on the site of the Burgh School, and an elementary school (Mr. Blackstock's) to take the place of the one vacated. The high school, for which the town is indebted to the munificence of Mr. Michael Nairn, will be one of the most complete institutions of the kind in Scotland, furnishing not only the usual general and classical curriculum, but fully equipped also as a technical school, with laboratories, workshops, and other appliances. The building, in a classical point of view, is a little peculiar in style. It may be described as a large, nearly four-square block of two floors, with a central division projecting considerably beyond the wings. The columns which formed the portico of the old school are now raised to an elevated position on this middle portion, the pediment being nearly on a level with the flat roof.

At present it has considerable dignity in appearance, and when the columns are all in position, the whole structure will gain in character and unity. The elementary school, which is also up and roofed in, has been designed by Mr. Cameron, of Edinburgh, and, although not an imposing work of art, seems likely to fulfil in large measure the requirements of a modern school. It is a long, double, one-storey building of red stone, crossed at right angles by what may be termed three transepts, each of these terminating on both sides of the school with a gable of considerable height, with large prominent windows. These gables, the numerous mullioned and transomed windows, and the high-pitched roof all tend to give individuality to the façade. The building, it is said, will provide accommodation for five or six hundred children. Kirkcaldy may thus, both in a moral and material sense, be said to be lengthening (or broadening) her cords and strengthening her stakes.

AMERICAN PATENT OFFICE.

THE annual report for the year 1893 of the United States Commissioner of Patents has been published. The ground is taken, says the *Scientific American*, that the race retains the power of great conceptions and that the World's Columbian Exposition will make itself felt in stimulating invention. Of recent criticisms passed upon the patent system, those complaining of the inconsiderate grant of invalid patents are treated as most germane to the question of administration of the office. The Commissioner upholds throughout the report the expediency of the office granting only valid patents. A classification division for systematising the records of the history of invention, making as far as possible the scientific and patent literature of the world accessible, is proposed. A salaried force of fifty-two employes is needed for this, some, however, giving but a part of their time to the classification work. The idea is to make the office search for novelty more thorough, and to give the office a higher standing upon the question of invention.

A study of eighty-one court patent cases, in which the patents were declared invalid, was made, and disclosed the fact that in twenty-six the references which defeated the patents were not shown to have been cited by the office, in twenty-nine a part were so cited, leaving twenty-six which were decided on office references. Again, in 988 court cases (1886-92),

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436 patents were sustained, and 532 were declared invalid in whole or in part. Of the latter, 428 were declared so by reason of some fault of the office, and 124 on new evidence. The results of a law firm's examination of fifty claims in ten patents held that thirty-five were invalid. The Commissioner cites the above, and he feels that they and their like indicate the necessity for a more thorough search by the office. By classification and indexing the library and records in general, the Commissioner hopes to effect an improvement in the search operations.

Recently three primary examiners resigned. The cases they had passed to issue were re-examined, and in 150 cases the applications were withdrawn from issue upon the ground that patents, if granted for them, would be void. This fact also is cited in the report to emphasise the importance of the classification of records and publications.

Various other points are spoken of. The office hereafter will make photographs of the drawings of patents in those cases where changes in the drawings are required or permitted, and will make the photographs part of the files of such cases. This is an excellent rule, as giving a full record of the original application. Precedence is to be given from the outset to actions upon the merits of applications; requirements in matters of form are to come after the other has been acted on, and after patentable matter has been found. Division of applications is only to be insisted on when an attempt is made to put several distinct inventions in one patent.

The *Gazette* now publishes the claims and principal drawings of patents which expire just before the date of the *Gazette*. This innovation, the Commissioner believes, will be a benefit to the public, partly as giving present subscribers in a sense the benefits of the *Gazette* of seventeen years ago.

The Patent Office exhibit at the World's Fair is alluded to. It has, as far as possible, been kept intact, and is now on exhibition in the Patent Office.

Legislation is recommended in several directions. The price of copies of patents, the Commissioner believes, could in many cases be advantageously lowered. The limitation of the term of American patents to the period fixed by the expiration of foreign patents for the same invention, the Commissioner would have changed, so that an American patent for full term could be granted if applied for within six months of the date of application in any foreign country. Legislation in the direction of establishing a patent bar is also recommended.

The business of the office for the year 1893 shows total net

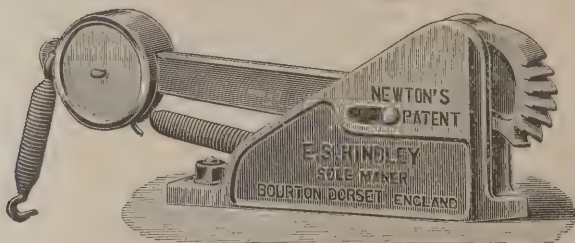
receipts of 1,242,871.64 dols. against an expenditure of 845,403.36 dols. under the appropriation, with approximately 295,635.09 dols. additional, giving a balance in the office's favour of 101,833.19 dols. There were 38,473 applications for patents, including 1,000 applications for designs and 120 for re-issue. Twenty-three thousand six hundred and seventy patents were issued, and 99 reissued. The patents issued and reissues granted during the year were less than those in 1885, 1889, 1890 respectively. Up to January 1, 1894, 521,700 patents have been granted by the United States, against 817,362 by all other countries. The year 1890, with 26,292 patents and reissues granted, remains the banner year of the office.

An exhaustive report upon the scientific library of the Patent Office is included as an appendix to the Commissioner's report. This gives the history and present condition of the library its scope and the condition of its indexing. An earnest plea is made for more money, and the need of further expenditure for its maintenance seems very clearly shown. During the year over thirty-one thousand journals and articles have been indexed. An appropriation of but 2,500 dols. was allowed for purchase of books and periodicals and for transportation. The present effort is to make an adequate card catalogue with cross references. Within a few months it is hoped that the catalogue of about 100,000 cards will be thrown open to the public.

We cannot let the occasion pass without expressing our appreciation of the ability shown in the report. In some ways it is an innovation, the present Commissioner holding very definite views of his own upon the subject of the administration of the office, and expressing them very clearly. Much of his work is worthy of high commendation, although we cannot agree with him in all his views. The report, curiously enough, illustrates the great difficulty and virtual impossibility of the Patent Office making an adequate examination into the novelty of an invention—an examination which the Commissioner wishes to have a *sine qua non*, in the fullest degree of adequacy, for the issuance of a patent.

WE understand that Mr. Harper Twelvetrees, of Dale Street, Manchester, is now fitting up the laundries at the Corporation Baths, Oldham, and also at the Corporation Baths, Bury.

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SOME OF THE PRINCIPLES OF SANITARY BUILDING.*

THE philosophy or science of sanitation embraces so wide an area that it is impossible within the limits of a popular lecture to do more than indicate the elementary principles by which it is bounded. An intelligent knowledge and application of these principles, however, tend to the welfare, happiness and enjoyment of life. The various details of sanitary science so overlap and are so interdependent, that it becomes exceedingly difficult to dilate on one without necessarily trespassing on others. So far as possible I propose to confine my observations in the present address to the hygienic considerations connected with building works, and to illustrate them by means of the exhibits to be found for the most part in this building.

I wish, however, at the outset to remark that by calling attention to any particular exhibit I do not mean thereby to express predilection for it, or to suggest that there are not others equally as valuable for the purpose intended. I allude to some simply as illustrating a type of the material or article suited to accomplish a particular sanitary purpose.

Our progenitors, in pardonable ignorance, worshipped as deities, sometimes with love and sometimes with fear, the then supposed elements—earth, air and water. What more calculated to inspire awe and thankfulness than the work of Mother Earth, repaying with bounteous gratitude labour expended, providing sustenance for man and food for beast? What more terrible than her vengeance when, in return for neglect, she substitutes want for amplitude, famine and misery? So with air, without which life becomes impossible, without which fire could not be obtained, warmth created, nor food prepared; or water, the absence of which is felt in acute suffering, and for the want of which humanity perishes.

We now know that these so-called elements are simple mechanical mixtures of certain simple gases forming the essentialities of our lives, and which demand of us intelligent comprehension, careful use and scientific sanitary application. Properly treated, we recognise these as the best of friends, the most willing and obedient of servants, the kindest of help-mates, but we are forced to acknowledge that when we ill-use them they become enemies to be feared, masters to be dreaded, foes to be avoided.

Now the whole crux of sanitary work may be summed up in one plain English word, "cleanliness." Impurities, whether allowed to exist in the air we breathe, the water we drink, the soil we rest on, the houses we dwell in, the clothes we wear or the body we live in, make for uncleanness, and want of cleanliness is want of sanitation.

Impure surroundings, defilement of soil, tainted atmosphere, polluted water, may not be the *causa causans* of specific disease, but in this nineteenth century experience unquestionably proves that they create a well-favoured nucleus for the growth, propagation and nourishment of most of the ills which flesh is said to be—but should not be—heir to.

Happily it is now mere matter of history, but it may be well to recall to your memory that the serious illness of His Royal Highness the Prince of Wales, the deplorable sacrifice of the lives of our soldiers in the Crimean War, the visitations of cholera and zymotic diseases which have, and do, invade us from time to time, have all undeniably been traced to neglect of sanitary precautions. "It is an ill-wind that blows no one any good," and it is probably due to these circumstances and the practical good sense of Englishmen that we have recognised the evils that bad sanitation engenders, and that we have come to the conclusion "that it is better to prevent than to cure."

If any proof were wanting of the beneficial effects arising from due regard to sanitation I could mention many convincing facts. I will content myself with quoting from Lord Playfair, who tells us that the annual death-rate in London was as follows:—From 1660 to 1680, it was 80 per 1,000; 1681 to 1690, 42.1; 1746 to 1755, 35.5; 1846 to 1855, 24.9; 1871 to 1880, 23; to-day about 19 to 20 per 1,000; and when you recollect the density of population (nearly 5 millions) as compared with 200 years ago, these facts must speak volumes to you.

Dr. Longstaff tells us that London far exceeds in population not only Paris, but Scotland, Switzerland, and even our antipodean colonies. It has double the population of Norway or Servia, nearly double that of Denmark and Greece. Its inhabitants are three times as numerous as those of New York or Berlin. It contains more people than Paris, Berlin and Brussels taken together, while it nearly doubles the united inhabitants of New York and its neighbouring cities of Brooklyn, Hoboken and Jersey; and Greater London added, it exceeds that of Sweden and is fast approaching Ireland. An appalling statement is made that the city is still gaining at the rate of 50,000 a year, 1,000 a week, 150 a day.

Wherever sanitary amendments have been introduced a decrease in the mortality of the people has uniformly followed. In the city of Salisbury the mortality fell from 28 per 1,000 to 17 per 1,000, and the death-rate from phthisis alone was reduced by no less than 49 per cent. If this be calculated you will at once see the number of lives spared, the sickness alleviated, and the poverty avoided.

I need not labour this more. I take it for granted that no person claiming intelligent appreciation can or will question the permanent advantage and the absolute necessity for sanitary considerations in our everyday life.

I can tell you little that is new, but I propose to direct your attention to those salient matters to which I have referred, and in the order in which I have placed them—earth, air and water—merely, however, adding that the complicated necessities connected with our building form only a fringe of the subject, that drainage and plumbing are not, as it is thought, "the Alpha and Omega" of hygienic considerations, important as they are, for our clothing, our personal cleanliness, our physical condition, the freedom from disease and non-adulteration of our food, whether raw, cooked or manufactured; care for public sanitation, such as roads, open spaces, overcrowding, factory regulations as carried out by municipal authorities—these all and many more are essential to the hygienic welfare of the community and to the production of those conditions which make life long, enjoyable and free in a large measure from the misfortunes of poverty and consequent anxiety.

The legacy of insanitary conditions which has been bequeathed to this generation has stimulated our inventive faculties and produced keen competition, so that if we avail ourselves wisely of opportunities offered we can select our materials to suit our various requirements, and at the same time our pockets. However, our one governing principle must be that by which the Vicar of Wakefield selected his wife, viz. he chose her, as you may remember, "as she did her wedding gown, not for a fine glossy surface, but for such qualities as would wear well."

Just a word as to drainage. Owing to faulty construction of sewers, such as bad gradients, decaying brickwork, saturated surroundings, it becomes easier for us to prevent than to avoid inevitable mischief which must arise if the interiors of our houses are placed in direct communication with the sewers. The exhibition is full of suggestions and materials for carrying this into effect, and I am glad to record that, after twenty-five years' hard work, this part of sanitary work has become recognised by the powers that be, and that from the Local Government Board downwards measures are taken to prevent the foul air of sewers from penetrating from the bowels of the earth to the interior surfaces of our dwellings. The whole matter lies in a nut-shell. Cut off all connection with the sewer by means of an efficient syphon trap (a real, not an illusive one), with proper cleaning cap, run your drain-pipes in straight lines with proper falls thereto, and interpose an intercepting chamber. Take care to introduce air to this, and put glazed open pipes to receive the soiled water before it enters the syphon; wherever there is a change in the direction of the pipes put an inspection-chamber, or chambers, so that the works can be easily examined. There is no such thing as finality, and you must not anticipate that any arrangement will last perfect for ever; therefore the system should not only be inspected and re-inspected, but cleansed and amended if necessary periodically. Pipes should be of best tested earthenware or strong and heavy iron. Samples are to be seen in this exhibition.

Drainage is immediately connected with plumbing works; for all this kind of work the best material is the cheapest. Soil-pipes should never be of less weight than 7 lbs. lead pipe, or strong cast-iron, barfed, or coated with Angus Smith composition; they should be open at top, and should be the means of thoroughly ventilating the whole system. W.C.'s are of many types; those that are self-cleansing are the best—their names are legion. To point out merits or defects would occupy time, and would weary without perhaps interesting you. It is perhaps scarcely necessary to add that pan closets and D traps are not permissible.

I must not be tempted to do more than thus briefly epitomise these subjects, which might fairly form the subject of another lecture. I mention them to show that they have not been forgotten. You will see that earth, air and water are all so intimately incorporated with my subject that I cannot well separate them in the following remarks, but if you will favour me with your attention you will note that they follow each other in logical sequence.

Now, as to foundation or texture of site upon which we have to build. Obviously this is one if not the most crucial of considerations equally applicable to all kinds and descriptions of building construction. With your permission we will dwell a little time upon the discussion of this important subject, particularly as it is one whose defects cannot easily be remedied if once adopted. Dr. Parkes points out that soils affect health by the air and water in the soil, its solid constituents, its conformation, and presence or absence of vegetation. A little local

* A paper read at the National Building Exhibition by Mr. H. H. Collins, F.R.I.B.A., F.S.I., and Fellow of Sanitary Institute of Great Britain, &c.

geological knowledge will assist us much, and this may be supplemented by direct local observations. Railway cuttings may be visited with advantage, excavations examined and records of them obtained, wells observed and useful information as to fluctuation of depths be sought for, and lastly, by sinking trial holes to 10 or 15 feet below surface of original level of the soil. The soils to be dealt with will probably be gravels or sandy, or those containing much sand and a small proportion only of clay.

Stoney clays and peaty soils absorb and retain moisture, and are scorched by summer heats because heat causes clay to contract and prevents access of air. Damp lands are of course cold by chemical evaporation of their moisture carrying off heat.

Clay soils are cold and damp and, Dr. Parkes tells us, engender rheumatism and catarrhs.

Sands favour great heat unless covered by grass; they radiate heat, and therefore the air over them is hot by day and night, and heat, you know, is a powerful factor in production of malaria and many diseases.

Here let us pause just to suggest one of the practical remedies for avoiding the evils which the above considerations and our own experience show to exist. Obviously the first thing to do is to drain our damp and ungrateful soils, such as clay soil and sand soils full of water, which lie on the impermeable soil beneath. I have already mentioned some well-worn vital statistics as to marvellous improvements to health of homes and localities where drainage and water supply have been duly attended to, but the physical results to the soil where works of this nature have been executed may be worthy of your attention. It has been found that the mean annual temperature of arable land has been raised nearly a degree by drainage, and, that the temperature of hill pasturage has been similarly affected. That during sudden falls of temperature and protracted cold, the cold passes more quickly and completely through undrained than from drained lands. That when the temperature of the air is higher than that of the soil, the drained land receives more benefit from the higher temperature than the undrained, less of its heat being lost by evaporation; so also superfluous rain and sleet soon run away from drained land. Thus by draining land you see we procure that which nature is always (and with success) striving to obtain, viz. equilibrium; that is, to maintain the soil at a comparative equal temperature. Undrained land is liable to continuous fluctuations, for when saturated with warm rain-water its temperature is temporarily raised, and when with melted snow it is temporarily lowered, and these alterations are as bad for the land as those who have to dwell on its surface.

According to Buchan the temperature of drained land has been sometimes raised 30 degs. over undrained land, often 20 degs. and frequently 150 deg., and he says the beneficial effect has been as great as if the land had been transported 100 to 150 miles southward.

But the soil has yet another dangerous attribute. It is one of nature's scavengers. Through its interstices runs the high road to disease. It is the conductor of air and water, and it influences not alone the atmosphere and life of its surface, but likewise considerable depths of its interior. Mr. Baldwin Latham has made the subject "the ground water" in the soil his own, and he has irrefragably proved that to its appearance or not may be traced many of the various zymotic diseases which from time to time become unpleasant and dangerous visitors amongst us. Ground water we can see and appreciate, but it is accompanied by its equally dangerous companion, ground air, which is invisible to sight, although its good or bad effects are equally manifest.

Professor Pettenkofer, of Munich, has given convincing outlines of the effects of ground air in its relation to the soil which I will try and epitomise for your benefit.

Adopting a rubble soil, gravel or sand, upon which we build some of our best and heaviest structures, as an example, he takes a measured bottle and packs it slowly and compactly with gravel. He then fills it with water, and finds that at least one-third of the contents of the bottle has been occupied by air, and of course the water has now taken its place, proving that a gravel foundation consists of two parts of gravel and one-third part of air, and this air, as we shall presently see, is in direct contact with the house which stands on its surface. He shows that sand, clay, stone, &c., are possessed of similar qualities, and by way of additional proof points out that various stones are used as filters. When a soil has pores partly filled with air and partly with water, it is called damp. When all passages of air are filled up with water, the degree of humidity is called ground water. Air and ground water are in continual circulation. To show you this he fills a cylinder with gravel, and by connecting it with a manometer he blows gently on the surface of the gravel; the liquid in the manometer begins to move; by blowing directly on the gravel and allowing the air to pass out freely the flame of a candle is extinguished. Air is thus proved to the senses to move freely through porous soils. Difference of temperature and diffusion

produce the same movements. Now, if air and water can thus travel and circulate underground, it is clear they can carry with them impurities, and if the house is in contact with the soil, and the air of the interior is warmer than that of the exterior, it will pump into the house the impure air, which has had impurities dissolved in it through the solvent action of the water and decayed organisms in the soil. There is no lack of instances of this kind at home and abroad where infected ground air and water have carried disease and misfortune into many and many a home; unless the ground be pure its emanations cannot be. The Caterham fever was caused by the water supply being contaminated. In the Swiss case of Lausanne, some miles existed between the source of the disease and locality affected. Dr. Hime relates how a man was seized with a serious illness, nature and cause being inexplicable. The sisters who nursed him were taken with the same symptoms. A friend who visited him said there was an escape of gas; this was derided by attendants and doctors, &c. At length an inspector of the gas office made an examination and confessed to having found an escape, but could not discover the source. The patient left the house and recovered. No sooner had he left the house than the fire was let out and the windows thrown open; then his neighbour was seized with the same symptoms. He too recovered by a rapid flight. At the end of some days a further examination discovered an escape of gas from the main pipe, which ran down the centre of the street some 20 feet away. The coldness of the weather had necessitated large fires in the house, and the increased heat developed a current of air from the ground to the house, the gas being sucked up with it. When the patient had left, the house cooled down and the current was diverted into the apartment of his neighbour. Similar instances have been related by Mr. Rogers Field, notably in the case of the Duchess of Connaught, &c.

Not only have the decayed vegetation and other organisms in soils to be taken into account, but we must recollect that we have to deal with made ground from which pure gravel has been removed and impure rubbish substituted, and filled with material peculiarly calculated to create mischief, such as vegetable refuse, decayed paper, wood, oyster shells, bones, rotten cloth, egg shells, &c. Now, if gases and air are insidious in their progress, water is none the less so, and prepares the food to contaminate the air. Distance is no deterrent, neither vertical nor lateral. Professor Geikie relates that in sinking deep wells leaves and other plants have come up with the first gush of water from depths of 400 feet. These organic remains, he tells us, were comparatively fresh, and were supposed to have travelled in underground channels from hills 150 miles distant and to have been three or four months on their subterranean journey. Even fresh fish have been brought up from depths of 170 feet. This may afford some explanation of the importation and propagation of cholera. So with dust in air. Tyndall discovered dust in the high Alps, and Geikie calls attention to the following statement, that during an eruption of one of the volcanoes in the island of Iceland, a fine impalpable dust fell in such quantities between Orkney and Shetland Islands that vessels sailing there required to have deposits shovelled off the decks every morning. The crops in Caithness proved a failure owing to the quantity of volcanic matter which fell on the ground, the distance from Caithness to Iceland being 600 miles. Many other instances can be given. In 1835 a similar circumstance occurred from a volcano in Guatemala, the fine ashes of which were carried 800 miles from the emission, and Darwin, in the "Voyage of the *Beagle*" in 1845 found that the atmosphere of St. Jago was associated with a fall of dust so impalpable and fine that it rested in the air as a haze of light fog. He found that the dust must have originated 1,000 miles away from the adjacent coast of Africa; it had been four days on the journey and had travelled 200 miles a day.

I could multiply these anecdotes *ad infinitum*. Now, rain in its descent takes up air, and consequently any impurities which may be contained in it. Water, when it has passed through soil, is impregnated with various substances, and this can be readily seen by evaporating the water and examining the deposited remains left at the bottom of the evaporating vessel. It is common knowledge that carbonic acid, mineral waters, sulphuretted hydrogen, carbonates of lime, soda and magnesia and chlorides are found. Then you have also ferruginous or chalybeates medicinal water, as at Bath; sulphur and magnesia water, as at Harrogate; carbonates of sodium, &c., at Buxton, Vichy, Carlsbad and Wiesbaden water, &c.

If I have wearied you with emphasising this part of my address it is because I conceive it to be most important to sanitary construction. You will see by the diagram taken from Dr. Pettenkofer's classic on cholera the result of sixteen years' close study and experience of ground water in Munich, and you observe that just as the ground water sank in the gravel soil of Munich so did fever rise. Pettenkofer points out that it would be incorrect to suppose great porosity of soil allows everything to flow through it; unfortunately, though it does allow of a flow of ground water, it also acts as a filter, which

retains things which it would be a blessing to have removed far away.

There is active and uninterrupted communication between the air of our houses and the ground beneath them. When, therefore, organic matter liable to putrefaction becomes deposited in the ground it is just like a dead body which we bury and leave to decompose. The more contaminated, the more impregnated the soil of a place is, the more does it favour outbreaks of typhoid fever and cholera. What is necessary to be done is here also to prevent fluctuation, or rather to obtain an even fluctuation, and so keep the ground water all the year round at the same level—at a level 15 feet below the surface (De Chaumont says if it is 5 feet it is persistently unhealthy), to prevent infiltration of organisms into the soil, and this can be done, as it has been done, by effective drainage and proper sanitary administration. A clay soil resting on a gravel foundation, through which ground water never rises sufficiently high to reach the clay, is unsusceptible to cholera. Mr. Ernest Hart has designated the preventable disease of cholera, in a very able and pleasantly-written paper in the *Nineteenth Century*, as being "a filth disease carried by dirty people to dirty places." This terse epigrammatic sentence is applicable to most of the zymotic diseases with which we are infested. Sir Charles Cameron, in his recent address at Portsmouth, corroborates these statements; he says, "to soil-pollution I attribute the prevalence of typhoid fever." We should be as particular with respect to the purity of our soil under our houses as we are with regard to the purity of air which surrounds them. He mentions that in Dublin during the last ten years 1 person in every 164 living on clay soil had typhoid fever, whilst 1 in every 92 living on gravel soil contracted the disease. This is occasioned when the soil becomes dry, and is more frequently the case with loose gravels than with impenetrable clays. Now the lesson I would ask you to learn from the above brief facts is that it is absolutely necessary, after proper drainage, to hermetically close down and so prevent all access of ground air to the house by amply covering the whole of the site with at least 6 inches thick of good hard concrete, composed of clean washed ballast gravel and Portland cement, and to float the surface with a coating of cement.

Most of the by-laws of the principal towns demand something of this kind, as also those of the London County Council, but the material used is singularly inefficient both in quantity and quality.

Having, however, sealed down the ground air and water we must proceed a step further; we must prevent any contact of our dwelling with adjacent ground. Various ways are open. Thus, we can put an open and wide area round our house, building the walls with hard bricks set in Portland cement. We can put a dry area similarly constructed and properly drained and ventilated.

We can build our walls hollow, or put between their outer and inner surface an impermeable material, such as hygienic rock cement or Seyssel asphalte. Or we can line vertically to a sufficient height above the soil with best Seyssel asphalte about 1 inch thick, and put on in two layers; or if we are much pressed by economical considerations, then we may use granolithic cement or a good Portland cement, at least 1½ inch thick, floated in to an even surface, preferably laid on a double course of tiles breaking joint. But we have not yet got a quite sure foundation for our house. We have to prevent what is scientifically known as capillary attraction, or what is popularly described as the rising of damp in and round the walls of the house. Capillary attraction (so called from the hair-like tubes) is caused by an automatic suction dependent on temperature, atmospheric pressure, and formation of the material through which it passes. A familiar example is a piece of cotton, which will empty a vessel. The model shows that it acts in direct proportion to the areas of the tubes through which the water, &c., passes. Ample appliances are at hand. We can use hard slates (bad absorbers of damp) in two layers breaking-joint, and set in cement (and this we can apply to rectify the defect in existing walls by cutting through the wall, underpinning with the slate courses). We can use a 7 lbs. to the foot superficial lead course, very desirable with stone walls. We can employ blue bricks of best hard and impermeable character. Or we can avail ourselves of asphalte (not pitch or other squeezable material) 1 inch thick. Or, lastly, we can insert one of the numerous glazed earthenware damp courses, of which this exhibition is singularly deficient, but of which Doulton and Cliff manufacture numerous kinds. A word of caution: never allow any of the so-called patent feltings, waterproof compositions, inferior asphaltes, such as pitch, &c., to be used. The former invariably rot and occasion settlements in the buildings, or become quite useless in a few years; the latter, if of any use at all, have no lasting qualities. Sanitary work must be well done or it is not sanitary.

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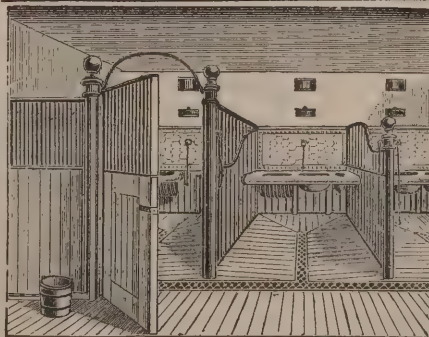
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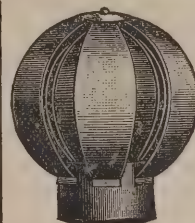
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water, damp, or impure air, we proceed to enclose the same and form a house or other structure, carefully proportioning our foundation so as to afford a broad base for our walls, and we calculate the weights to which we may subject the specific soil upon which we are about to build. We recognise that if we do not insure stability to our structure we shall insure hereafter shakes and settlements, and this when perhaps it is too late to remedy means insanitary construction.

Now the primary functions of our enclosures are:—1. For shelter against heat and cold. 2. For the admission of properly tempered air. Let us glance at the philosophy of the subject in order that we may correctly understand our work. Heat is propagated by conduction, by radiation, and by reflection. Our walls act as our clothes; and, indeed, the walls of the house are the principal garments of the body. Many garments afford sufficient warmth—thick walls sufficient heat. All bodies are more or less porous; those least so are of course the densest. Now various bodies possess different facilities for conduction of heat. Dense bodies are good conductors; their particles being closest together easily communicate heat to each other. Porous bodies are imperfect conductors; stone transmits heat comparatively rapidly, brickwork does so less, and plaster less still, and glass stands somewhat intermediate.

Radiant heat passes directly through air without heating it; it is absorbed by walls, &c., and is again radiated to the air until equilibrium is established. The radiant and absorbent powers of materials are equal to each other. The heat received from the sun is an example of radiant heat, which travels 95 millions of miles through space. Reflected heat does not heat the body upon which it impinges, but sends it back from whence it came. Another effect of heat is evaporation, which by abstracting heat causes great cold or absence of heat.

Familiar examples of good conductors are metal instruments, which conduct heat so quickly that we are obliged to use wooden handles, which are bad conductors, in order to hold them. Metal tea-pots and kettles have wooden or porcelain handles for same reason. Water is a bad conductor, can be heated from top, and takes long time to conduct heat below its surface. Glass is a bad conductor. We may heat a rod into fusion, and hold one end in our hand whilst so doing. So with clay, terra-cotta, &c., and plaster. Wood beams char long before they burn, and we enclose good conductors, such as iron, &c., with plaster, the latter being a bad conductor. Paper may

be rolled round smooth brass bars and placed over gas; the heat is conducted away so quickly that the paper is not even discoloured; placed round wood the paper would be quickly discoloured, being so bad conducting power of wood. Bad conductors are, however, good radiators, and this is why newspapers are used as coverings to the bodies with such good results.

If water can be absorbed or pass through walls, so can air, because air is 770 times lighter than water. It is very easy to make a watertight compartment, but very difficult to make an airtight one.

[Here was shown and explained Pettenkofer's experiment showing air passing through mortar and brick cylinders.]

Water is a bad conductor, as shown by above experiment. Sandstones are so porous as to allow water to pass easily through them. As the pores of the materials are filled with water they become impervious to air, therefore airtight walls are synonymous with wet walls.

Suppose that 100,000 bricks are used in a building, each weighing 10 lbs, then there will be 10,000 gallons of water to be got rid of before the wall can be said to be dry and the house habitable.

Damp and wet walls impede ventilation, prevent diffusion of the gases through their pores being sealed. They disturb the heat economy of our bodies by abstracting heat in the one direction, by radiating our heat towards them; they absorb heat by evaporation; they are better conductors of heat than dry walls, just as are wet garments, and consequently raise our heat losses by a one-sided and increased radiation. Therefore diseases caused by cold are frequent in damp houses, such as rheumatism, catarrh, Bright's disease, &c. Superfluous heat must be got rid of by evaporation into and by the air; the capacity of the air for receiving vapour depends on its temperature, on the quantity of water it already contains and on the velocity with which it travels over the surface of the wall.

Time must be given before a new-built house ought to be occupied, and regulations should be made to prevent occupation until its hygrometrical conditions are such as to warrant its being inhabited. A wall may appear to be dry—why is it that oftentimes after inhabitation damp appears? Pettenkofer shows that damp spots arise from the precipitation of water from the air on the walls. He remarks that the inhabitants of houses besides giving off water and vapour from their lungs and skin do so by numerous household manipulations, such as cooking, washing, cleansing, &c. Then if the air of the

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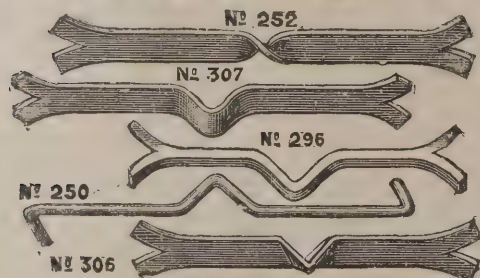
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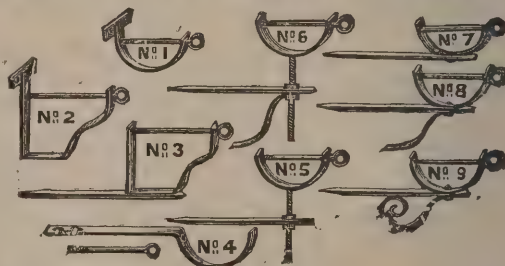
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house is already saturated with water in proportion to its temperature, a small degree of cold is sufficient to produce dew or a precipitation from the vapour, as we see it on window panes or varnished papers. The porous wall can, however, imbibe a good deal, and in old houses we may see windows, &c., sweating whilst the walls seem perfectly dry. The walls go on condensing water till their pores are full and all air expelled, then not slowly or gradually but all at once numerous damp spots appear. The walls have just lost enough of the building water to allow air to occupy part of their pores. Optically they seem dry. Very little water is required to choke their pores, and wherever this appears damp spots break out. A fire is a good cause. The heat from it begins by heating places nearest to it, and by evaporating water saturates the air of the room, but at a distance from the fire the walls being cold the vapour of the air condenses. Dew falls, and if the pores of the walls still contain quantities of building water they begin to overflow.

What are the functions of walls? The removal into the open air of the watery vapour, caused and developed by the occupants of the house, to pass it through them and to allow it to evaporate on their outer surfaces. Porous materials can, therefore, only make dry dwellings. A workmen's building was once constructed of iron slag; as soon as the workmen inhabited it damp began to manifest itself, until at last it became so wet as to be uninhabitable. The only way to quickly dry the house is as I have said; and to do this, to heat all stoves and allow continual passage of warm air through the rooms or thorough ventilation. Walls must be kept clean; porous walls can absorb into their interstices organic and other impurities, which decay and cause the walls of houses, hospitals, &c., to become sources of disease.

We must of course use the materials we have at hand, but we must select and apply them according to the teaching of sanitary science. First we must obtain a good, dense and evenly-grained stone, or a hard, well-burnt, dense brick, for our walling, and we must take care to cement them together with good mortar. We thus provide good conductors and ventilators for our dwellings. But as the outer side of our walls may become impregnated with water, or may be cooled by evaporation or heated by sun, we must temper these effects by covering them with an imperfect conductor, such as plaster, and a good radiator, such as paper, again over this. If the walls be cold and damp, without these precautions we have the water evaporated and condensed on the surface, a not infrequent nuisance, due to neglect of these considerations. And if we varnish or polish

our walls, a similar condition arises and from a similar cause. To graduate conduction and to keep our walls dry and warm, we must make them of sufficient thickness. A wall may have sufficient stability; and yet be a most unhealthy one. In fact the walls themselves must be clothed as we clothe our bodies, and for the same reasons. The various Building Acts of Parliament in this country have been designedly and admittedly drawn not from a sanitary standpoint, but to insure stability and prevention of fire, and clearly no walls in an inclement and variable climate such as ours should be permitted of a less thickness than 14 inches thick.

A well-built thick brick wall is, therefore, a good one, and brick is a desirable material to employ; it is dry, admits a considerable amount of spontaneous change of air, and it absorbs and radiates heat. Of course there are many forms and various constructions of walls, hollow, glazed brick, terra-cotta, &c., to explain which would require more time than is at our disposal, but the above remarks apply to the construction of all, and many examples are to be found in this exhibition. We have now only to finish our wall. We have kept his feet dry. We have protected his body by proper construction and material, and we have now only to shield his head from inclemency of weather. To do this, we must cope it with hard, sound, blue bricks built in cement, and must not forget in such case to throw the water from its surface by tile creasings or other damp-proof projections, else by saddle-bricks, or by hard, not porous stone coping, properly weathered and throated. We may weather cement the top, or lastly may project the eaves of the roof over the walls when Acts of Parliament will allow of our so doing.

Having built our walls and enclosed our space, we must now cover it in by roof or flat covering, and the same principles which apply to walls will equally so to roofs. We want above all a dry covering impervious to wet and cold, a covering which will keep us warm in winter and cool in summer, again seeking for that equilibrium of temperature so essential for the preservation of health and sanitary construction.

We have an abundant choice of materials—good homogeneous slate which must be free from argillaceous properties, else it will soon absorb wet and decay; tiles of dense quality, well pressed; either of these materials should be laid with ample lap and on good seasoned boarding and wood fillets. To prevent conduction of heat a non-conducting substance should be inserted between the boarding and covering. Lead or zinc laid on asphalted felt or paper to proper falls makes



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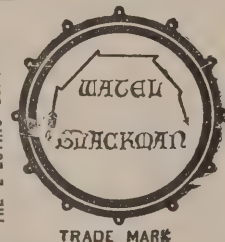
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a very good covering, but care must be taken that they are not only of good quality but of requisite thickness, and so laid as to allow of expansion and contraction. Lead should not be less than 6 lbs. to the foot, of well-milled and soft quality, and zinc should be of Vieille Montagne manufacture, weighing not less than 21 ozs. to the foot superficial. The boarding should be laid the way of the lead or zinc. We may have flat roofs formed of steel or iron joists filled with breeze cements and covered with Seyssel or Val de Travers asphalte. Inferior asphalte must always be avoided, it invariably develops into a leaky covering. We may also employ Portland cement coverings laid on a double course of tiles, breaking joints, but this covering is not to be recommended except on economical grounds. It would be impossible to furnish more than these outlines for your guidance, but study and experience will fill in the detail; rest assured, however, that to make even a tolerably perfect sanitary house, each portion must and will demand equal attention and precaution.

(To be continued.)

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IT has been recommended that the ventilation should be altered by (1) the substitution of silent-running open fans, or propellers, of similar form to those already in use in the building for the coke fires, which are now kept continually burning at the base of the various shafts in the towers; (2) the filling of the present steam pipes with water, and the heating and circulation of the water by means of the steam; (3) the utilisation of Tobin tubes in the committee-rooms for the purpose of securing a more equable diffusion of the fresh air admitted through the floor; and (4) the formation of extract shafts under the side galleries in the legislative chamber, with the object of purifying the air breathed by members sitting on the back benches and by the occupants of the various galleries.

THE IRON AND STEEL INSTITUTE.

THE programme of the Institute meeting to be held at the Institution of Civil Engineers on May 2 and 3 has just been issued. Mr. Windsor Richards will preside. Some of the papers to be read and discussed will excite great interest in the iron districts. Professor J. O. Arnold, in a paper on the "Physical Influence of Certain Elements upon Iron," will attack some of the theories of Mr. Roberts-Austen; Mr.

William Hawdon will describe an entirely new departure in the construction of blast-furnaces; and Mr. Jeremiah Head will point out the growing importance of Scandinavia as a source of iron-ore supply. Mr. D. Selby-Bigge will discuss the uses of electricity in the way of replacing steam and other motors in the iron and steel industries. Mr. G. J. Snelus will explain a new French process, a sort of Bessemer process on a small scale. An important paper on the relations between the chemical constitution and ultimate strength of steel will be read by Mr. W. R. Webster; and Mr. J. E. Stead and Mr. H. K. Bamber will respectively discourse on the microscopic examination of iron and steel and the analysis of steel.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

6996. Robert F. Dampier, for "Improvements in and connected with windows."

6997. Henry George Hellier, for "Improvements in sash-fasteners, applicable to windows and doors."

7000. Albert Thomas Butler, for "Improvements in window frames."

7084. Walter Vaughan, for "Improvements in or connected with water or other liquid tap-fittings."

7154. George Herbert, for "Improvements in scales."

7337. James Fred. Tonkin, for "Improvements in door locks."

7355. Nimrod Simmons, for "A new and improved detachable joint for water-pipes, soil-pipes and sewers."

7356. Nimrod Simmons, for "A new and improved detachable flushing-valve and water-closet attachment."

7407. Edward Morley, for "Improvements in fire-escapes."

7449. Max von Koppelow, for "Improvements in safety locks."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

CONTRACTS OPEN.

ABERAMAN.—May 10.—For Building Police Station. Mr. Mansel Franken, County Offices, Westgate Street, Cardiff.

ABERDEEN.—May 7.—For Additions to Crathes Castle. Messrs. Brown & Watt, Architects, Aberdeen.

ALTON.—For Building Church Schools. Mr. J. Hall-Gibbons, Architect, 40 City Road, Birmingham.

BALLYMACARRETT.—May 8.—For Building Dispensary. Messrs. Young & Mackenzie, Belfast.

BAMBURGH.—May 9.—For Restoring Chancel of Parish Church. Messrs. Hicks & Charlewood, Architects, Newcastle-on-Tyne.

BARKING.—May 8.—For Erection of Disinfecting House, with Disinfecter, Additions to Engine-house, Erection of Engineer's Cottage, and Construction of Barge Berth and Timber Framing to Wall of Town Wharf. Mr. C. J. Dawson, Surveyor, East Street, Barking.

BARNSELY.—May 9.—For Building Four Houses, Shops, Stable, &c. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

BATLEY.—May 7.—For Building House. Mr. John H. Brearley, Architect, Commercial Street, Batley.

BELFAST.—May 9.—For Building Gate Lodge, Woodvale Park. The City Surveyor.

BETHNAL GREEN.—May 17.—For the Supply and Delivery of Guernsey Granite Pitchings. Mr. F. W. Barratt, Surveyor, Vestry Hall.

BIRMINGHAM.—May 19.—For Additions to Workhouse Laundry. Mr. W. H. Ward, Architect, Paradise Street, Birmingham.

BRENTFORD.—May 8.—For Erection of Workhouse Infirmary. Mr. W. Stephens, Union Offices, Isleworth.

BRISTOL.—May 28.—For Building Board School. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BURY ST. EDMUNDS.—May 11.—For Erection of a Post Office. Postmaster, Bury St. Edmunds.

CARLTON.—May 9.—For Building Board School for Infants. Messrs. Senior & Clegg, Architects, 15 Regent Street, Barnsley.

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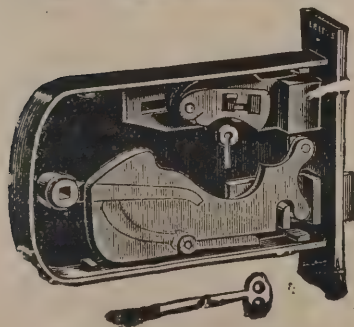
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CHESHUNT.—May 5.—For Drainage and Water-Supply Works to Six Villas. Mr. James Bunce, Turner's Hill, Cheshunt, N.

CHISWICK.—May 16.—For Sewering and Making-up Prebend Gardens, St. Mary's Grove, Gordon Road and Eunice, Road. Mr. Arthur Ramsden, Vestry Hall, Tottenham Green, N.

CLAY CROSS.—May 8.—For Building Board Schools. Messrs. Rollinson & Son, Architects, 13 Corporation Street, Chesterfield.

CLAYTON.—May 5.—For Building Eight Scullery Houses. Mr. Sam Spencer, Architect, 344 Great Horton Road, Great Horton.

DARLINGTON.—May 9.—For Stations and Buildings for Railway Extension. Mr. Ernest E. Meek, Secretary, Darlington.

DEWSBURY.—May 9.—For Building Residence. Mr. W. Crawshaw, Architect, Market Place, Batley.

DOWLAIS.—May 5.—For Building Church, Pengarnddu, and at Pontclown. Mr. E. M. B. Vaughan, Architect, Cardiff.

DUBLIN.—May 7.—For Additions to Institution for Imbeciles, Palmerstown. Mr. G. P. Beater, Architect, 17 Lower Sackville Street, Dublin.

EAST COWES, I.W.—May 8.—For Sinking Well, 135 Feet deep, in Brickwork and Cast-iron Cylinders, and Building an Engine House; for Supplying and Fixing an Oil Engine, Three Throw Pumps and other Machinery. Messrs. Lemon & Blizard, Castle Lane, Southampton.

EAST STONEHOUSE.—May 10.—For Additions to Police Station. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

ESKDALE.—May 14.—For Building House. Mr. John Butler, Architect, Barrow.

FULHAM.—May 9.—For Making-up and Paving Turneville Road. Mr. J. P. Norrington, A.M.I.C.E., Surveyor.

GALASHIELS.—May 14.—For Building Post Office. H.M. Office of Works, Edinburgh.

GLOUCESTER.—May 4.—For Erection of a Waggon-repairing Shop for Midland Railway Company. Mr. James Williams, Secretary, Midland Railway, Derby.

GODALMING.—May 7.—For Building Technical and Art School. Mr. Samuel Welman, Borough Surveyor.

HOOLE.—May 11.—For Repairs to Workhouse. Mr. R. C. Davies, Architect, 24 Newgate Street, Chester.

HUNSTANTON.—May 10.—For Building Detached Residence. Messrs. George Fill & Co., Architects, 1 Queen Street, Norwich.

ILFORD.—May 8.—For Construction of Swimming and Slipper Baths. Mr. John W. Benton, 3 Cranbrook Road, Ilford.

IPSWICH.—May 22.—For Additions to Board School. Mr. T. W. Cotman, Architect, Northgate Street, Ipswich.

JACOBSTOW.—May 9.—For Building Board School. Mr. O. B. Peter, Architect, Launceston.

LAKENHAM.—May 5.—For Building Four Dwelling-houses. Messrs. George Fill & Co., Architects, 1 Queen Street, Norwich.

LEWISHAM.—May 8.—For Kerbing, Tar Paving, Metal-ling and Channelling Works. Mr. Edward Wright, Board of Works Offices, Catford, S.E.

LEWISHAM.—May 8.—For the Supply of Road Material. Mr. Edward Wright, Board of Works Offices, Catford, S.E.

LIVERPOOL.—May 9.—For Taking Down and Rebuilding Warehouse. Mr. T. Houghton, Secretary, Euston Station, London.

LLANGADOCK.—May 10.—For Repairing Church Tower, &c. Rev. Wm. Rees, Vicarage, Llangadock, R.S.O.

LLANGFNI.—May 22.—For Erection of County Buildings. Mr. J. L. Griffiths, Clerk of the Peace, Holyhead.

LLWYNPIA.—May 12.—For Building Church and Hall. Mr. E. M. B. Vaughan, Architect, Cardiff.

NEWBURY.—May 7.—For Construction of Cattle Shed. Mr. E. A. Strickland, Borough Surveyor.

OULTON BROAD.—May 5.—For Building Temperance Hotel and Boarding House. Messrs. George Fitt & Co., Architects, 1 Queen Street, Norwich.

PORTLAND TOWN.—May 7.—For Painting, Colouring, &c., at St. John's Relief Station, Culworth Street. Mr. H. T. Dudman, Guardians' Offices, Northumberland Street, Marylebone Road, N.W.

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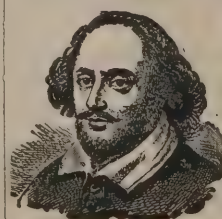
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POOLE.—May 15.—For Drying Closet for Hot-Water Supply to Baths. Mr. H. F. J. Barnes, Architect, Towngate Street, Poole.

PORTSMOUTH.—May 16.—For Building Workshops at Schools, for the Guardians, and Electric Fittings for Offices. Messrs. Rake & Cogswell, Architects, Prudential Buildings, Portsmouth.

RAWTENSTALL.—May 7.—For Construction of 3,127 Lineal Yards of Pipe Sewer. Mr. Henry A. Cutler, A.M.I.C.E., Borough Surveyor, Rawtenstall.

SHEFFIELD.—May 4.—For Building Board School, Bole Hill. Mr. W. J. Hale, Architect, 13 St. James Row, Sheffield.

SOUTHWARK PARK.—May 22.—For the Erection of Public Conveniences. Mr. H. de la Hooke, Clerk to L.C.C., Spring Gardens, S.W.

SOWERBY BRIDGE.—May 17.—For Additions to Christ Church. Messrs. Horsfall & Williams, Architects, Halifax.

SPALDING.—May 8.—For Erection of Two Corrugated Iron Roofs at Gasworks. Mr. H. H. Hawey, Clerk to Spalding Improvement Commissioners.

STANNINGLEY.—May 7.—For Building House and Premises. Mr. H. Hodgson, Architect, 27 Kirkgate, Bradford.

SUTTON, SURREY.—May 21.—For External Repairing and Painting Main Building of Brighton Road School. Mr. Church, William Street, Woolwich.

SWANSEA.—May 22.—For Building Board School. Mr. G. E. T. Laurence, Architect, 181 Queen Victoria Street, E.C.

SWINDON.—May 21.—For Building Technical Schools. Mr. T. B. Silcock, Architect, Milsom Street, Bath.

UCKFIELD.—May 19.—For House and Additions to Grammar School. Mr. H. Curtis Card, Lewis.

WANDSWORTH.—May 9.—For Cleansing and Painting Works at Infirmary. Mr. W. C. Poole, 2 Belleville Road, Wandsworth Common.

WAR DEPARTMENT.—May 5.—For External Painting of Chelsea Barracks, External and Internal Painting of Hounslow Cavalry and Infantry Barracks. Colonel R. Athorpe, R.E. Office, 41 Charing Cross.

WAR DEPARTMENT.—May 9.—For External and Internal Periodical Painting and Colouring, &c., of Royal Artillery Barracks, Army Service Corps Barracks, Royal Military

Academy, and Herbert Hospital in the Woolwich R.E. District. Colonel W. H. Rathborne, Commanding R.E., Woolwich.

WATERLOO.—May 14.—For Additions to Town Hall. Mr. F. Spencer Yates, Surveyor to the Local Board, Town Hall, Waterloo.

WEST HAM.—May 8.—For Paving of Seven Streets and the Construction of 1,000 Yards of Stoneware Pipe-Sewers. Mr. Fred. E. Hilleary, Town Hall, West Ham.

STOURBRIDGE SCHOOL OF SCIENCE AND ART.

A SCHEME has been suggested at Stourbridge for the erection of a new school of science and art in the town. The Worcester-shire County Council have promised 600*l.* towards the outlay on the school if at least an equal sum is subscribed locally. It is thought undesirable to spend any money on a building on an objectionable site, but the endeavour may be made, if possible, to erect a school in a better position. Rough plans have been prepared for very complete accommodation for science and art teaching in Worcester Street. These involve an estimated expenditure of 7,000*l.*

TENDERS.

BENFLEET.

For Additions to Schools, South Benfleet. Mr. CHAS. A. NICHOLSON, Architect, Beaumont Street, Marylebone.

White, Bow	£357	5	9
Thorp, Leigh	320	0	0
Multon & Wallis, Gravesend	299	10	0
Rous, Crays	299	0	0
Holmes & Berry, Southend.	295	0	0
Hibbards, Hadleigh	295	0	0
Harrison, Islington	280	0	0
Watts, S. Benfleet	275	15	0
Baylis, Forest Gate	268	10	0
TREDALE, 3 King Street, W. (accepted provision- ally)	247	0	0

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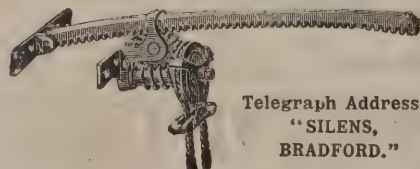
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Mason.

Heap & Harrison, Cleaver Street Station	£1,385	10	0
T. Smith, Kidrow Lane Station	1,165	5	1
G. Read & Son, Cog Lane Station	927	9	11

Joiner.

G. Smith & Son, Burnley, Cleaver Street	269	10	0
G. Smith & Son, Kidrow Lane	209	10	0
G. Smith & Son, Cog Lane	209	0	0

Slater.

W. Stanworth, Burnley, Cleaver Street	55	0	0
W. Stanworth, Kidrow Lane	35	18	10
W. Stanworth, Cog Lane	35	14	0

Plumber and Glazier.

J. Brooks, Cleaver Street	107	0	0
R. Roberts, Cog Lane	64	16	7
Collings Bros., Kidrow Lane	58	19	3

Plasterer and Painter.

T. S. Radcliffe, Bridge End, Burnley, Cleaver Street	83	15	7
T. S. Radcliffe, Kidrow Lane	73	3	4
T. S. Radcliffe, Cog Lane	65	3	4

For Building Offices in Parker Lane and Saunder Bank, for the Corporation. Mr. F. S. BUTTON, Borough Surveyor.

Accepted Tenders.

Smith Bros., excavator, mason and brick-layer	£1,560	0	0
Clegg Bros., carpenter and joiner	829	18	2
J. Shoesmith, plumber and glazier	244	0	0
J. Shuttleworth, plasterer and painter	119	11	6
O. Whittaker, slater	42	4	4

CARDIFF.

For Formation of Roads and Sewers, Nottingham and Lincoln Streets, Canton, Cardiff, for the Canton Property Co., Limited. Messrs. VEALL & SANT, Architects, Cardiff.

F. ASHLEY (accepted)	£547	18	0
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Lowest of Eleven Tenders received.

CARLISLE.

For Erection of a Salvation Army Citadel and Shops (first portion), for the Carlisle Citadel Buildings Company, at Annetwell Street, Carlisle. Mr. ALEXANDER GORDON, 101 Queen Victoria Street, E.C., and Mr. J. WILLIAMS DUNFORD, M.S.A., F.I.Inst., 1000 Queen Victoria Street, E.C., Joint Architects.

R. G. Bryce, Carlisle	£3,300	0	0
G. Hill, Carlisle	3,284	0	0
Beaty Bros., Carlisle	3,125	0	0
Laing, Carlisle	3,028	0	0
J. Beaty, Carlisle	3,010	0	0
J. & R. Bell, Carlisle	2,989	0	0
J. H. Read, Carlisle	2,959	0	0
Martin & Co., Croydon	2,753	0	0
T. MORGAN, Wood Green (accepted)	2,700	0	0
Architect's estimate	2,850	0	0

CHESHUNT.

For Works of Sewerage, Goff's Oak, for the Cheshunt Local Board. Mr. SAMUEL TOWLSON, Surveyor, Turner's Hill, Cheshunt.

Laing & Son, Adelphi	£2,540	0	0
Wilkinson Bros., Finsbury Park	2,479	0	0
T. Rowley, Tottenham	2,085	0	0
Cooke & Co., Battersea	1,975	0	0
Munday & Son, London	1,851	0	0
G. Jackson, Plaistow	1,790	0	0
G. Osenton, London	1,785	0	0
Fry Bros., Greenwich	1,758	0	0
Killingback, Camden Town	1,677	0	0
Wimpey & Co., Hammersmith	1,674	0	0
J. Dickson, St. Albans	1,653	0	0
T. Adams, Wood Green	1,645	0	0
J. Neave, Forest Hill	1,639	0	0
G. Bell, Tottenham	1,614	0	0
W. Lawrence, Waltham Abbey	1,599	0	0
W. Nicholls, Wood Green	1,591	0	0
W. Griffiths, Kingsland Road	1,550	0	0
M. E. KITTINGHAM, Reading (accepted)	1,517	0	0
D. H. Porter, London	1,490	0	0

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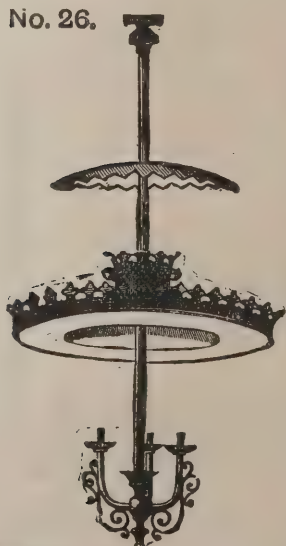
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Akers & Co., South Norwood	£249	0	0
W. Smith, Croydon	240	0	0
H. Baker, Thornton Heath	238	15	0
P. R. Hubbard, Croydon	225	0	0
Bryan & Son, South Norwood	221	0	0
J. W. Trappitt, Beddington	217	0	0
T. Barton, Croydon	216	0	0
Bulled & Co., Croydon	203	0	0
Huntley Bros., Croydon	178	0	0
A. BULLOCK, Croydon (accepted)	170	13	4

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For Manufacture, Delivery, Setting to Work and Maintaining Sewage-Pumping Machinery, Two Boilers and other Work, for the Eastleigh Local Board. Mr. H. J. WESTON, Engineer, 24 Portland Street, Southampton.

Easton, Anderson & Goolden, London	£1,094	0	0
R. Warner & Co., London	828	10	0
G. Waller & Co., Southwark	742	18	0
Tangyes, Limited, Birmingham	690	0	0
Pratchitt Bros., Carlisle	687	5	0
GODDARD, MASSEY & WARNER, Nottingham (accepted)	679	3	0
Woodhouse & Rawson, Kidsgrove	600	18	0

ECCLESHALL.

For Building Stores in Fawcett Street and Bellefield Street, for the Eccleshall Industrial and Provident Society, Limited. Mr. JAMES HALL, Architect, Paradise Square, Sheffield. Quantities by Architect.

Accepted Tenders.

J. Morton, Sheffield, bricklayer and mason	£870	0	0
C. H. Gillam, Sheffield, carpenter and joiner	368	15	0
J. Rule, Sheffield, plumber and glazier	78	0	0
Unwin & Son, Sheffield, plasterer	59	0	0
Ellis & Wetherill, Sheffield, slater	40	0	0
J. Clark, Sheffield, painter	28	10	0

ERDINGTON.

For Building Infirmary at Workhouse, Erdington, near Birmingham, for the Guardians of Aston Union. Mr. COOPER WHITWELL, Architect, 1 Cannon Street, Birmingham.

W. Bloore	£10,700	0	0
J. E. Moorhouse	10,572	0	0
S. Surman & Sons	10,475	0	0
J. Harley & Son	10,449	0	0
J. Mallin	10,240	0	0
J. Bowen	9,997	0	0
W. Robinson	9,995	0	0
T. Mills & Son	9,970	0	0
G. Trentham	9,890	0	0
R. M. Hughes	9,871	0	0
B. Whitehouse	9,768	0	0
J. Moffatt & Sons	9,700	0	0
W. LEE & SON, Aston (accepted)	9,640	0	0
W. Hopkins	9,600	0	0
T. Johnson	9,497	0	0
Gowing & Ingram	9,133	0	0

FERNHURST.

For Alterations and Additions to Fernhurst Board School, near Haslemere, Sussex.

Harding Bros., Shottermill	£181	18	0
B. Slade, Fernhurst	160	10	5
F. Gale, Fernhurst	159	0	0
W. CHASE, Fernhurst (accepted)	152	5	0

Frinton-on-Sea.

For Building Eighteen Houses, for Mr. R. P. Cooper. Mr. W. G. GILLINGHAM, Architect, Frinton-on-Sea, Essex.

Girling & Coe	£4,954	0	0
J. Dobson	4,822	0	0
Bell & Son	4,360	0	0
E. West	4,350	0	0
Ellis & Turner	3,950	0	0
H. LINZELL (accepted)	3,619	0	0
Architect's estimate	3,760	0	0

FROME.

For Building Farmhouse on the Orchardleigh Estate. Mr. B. VAUGHAN JOHNSON, Architect. Quantities by Messrs. TUCKER & HUNTLY, 33 Argyll Street, W.

C. Wibley	£1,224	10	0
J. T. Seward	1,116	10	0
J. VALLIS, Frome (accepted)	1,110	0	0

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For Restoration (Partial) of Ledbury Church. Mr. PEARSON, R A, Architect.
Highest Tender £5,250 0 0
BUNNING & SON, London (accepted) 3,062 0 0
Six Tenders received.

LIVERPOOL.

For Supplying and Fixing Mahogany Fittings in Saloon of s.s. *Heraclides*, for Messrs. H. P. Houston & Co., Liverpool. Mr. T. CLARKE, Architect.
S. J. WARING & SONS (accepted) £2c8 0 0

LEYTON.

For Forming, Sewering and Making New Roads on the Belmont Park Estate, High Street, Leyton. Mr. W. A. BURR, Surveyor, 65 Chancery Lane, W.C.

	Aberdeen Curb.	Norway Curb.
Griffiths	£1,919 0 0	£1,835 0 0
Jeffreys & Marshall	1,710 0 0	1,624 10 0
Hollingsworth	1,392 19 2	1,323 19 2
Bell	1,358 0 0	1,278 0 0
Harvey	1,268 0 0	1,220 0 0
Adams	1,265 0 0	1,229 0 0
Jackson	1,222 0 0	1,122 0 0
Reeves	1,218 0 0	1,168 0 0
Porter	975 0 0	925 0 0

ADAMS (Amended Tender) (accepted), £1,160.

LONDON.

For Pulling-down and Rebuilding Nos. 125 and 127 Newington Butts, Walworth, for Messrs. Mathews. Mr. F. A. POWELL, F.R.I.B.A., Architect. Quantities supplied by Mr. WALTER WEST.

Burman & Son	£3,240 0 0
Tyerman	3,230 0 0
Mills & Son	3,188 0 0
H. L. Holloway	3,100 0 0
J. O. Richardson	3,100 0 0
Josoyne & Young	3,045 0 0
W. & H. Castle	2,995 0 0
Downs	2,950 0 0
Smith	2,818 0 0

LONDON—continued.

For Pulling-down Old Police-station in Judd Street, Euston Road, and Rebuilding a New Police Station on the Site. Mr. JOHN BUTLER, Architect. Quantities by Mr. W. H. THURGOOD.

Higgs & Hill	£9,999 0 0
Perry & Co.	9,696 0 0
Hall Bros.	9,693 0 0
Dove Bros.	9,477 0 0
Scrivener & Co.	9,460 0 0
Grover & Son	9,417 0 0
Smith & Son	9,400 0 0
Ansell	9,380 0 0
Lathey Bros.	9,274 0 0
Kilby & Gayford	9,098 0 0
Chessum & Sons	8,995 0 0
Lawrance & Son	8,887 0 0
J. O. RICHARDSON, Peckham (accepted)	8,829 0 0

For Building New Bakery in Brewery Road, Caledonian Road. Mr. W. EGERTON, Architect. Quantities supplied.

Mowlem & Co.	£7,742 0 0
Holliday & Greenwood	7,597 0 0
Houghton & Son	7,492 0 0
Williams & Son	7,429 0 0
Gregar & Son	7,190 0 0
Kirk & Randall	7,164 0 0
J. O. RICHARDSON (accepted)	6,929 0 0
Battley, Son & Holness	6,924 0 0

For Pulling-down No. 141 Rye Lane, Peckham, S.E., and Erecting Shops and Flats thereon. Mr. MANNING, Architect.

Allen & Sons	£2,865 0 0
Elliott	2,800 0 0
Maides & Harper	2,675 0 0
Moody	2,612 0 0
Battley	2,597 0 0
Smith	2,586 0 0
J. O. Richardson	2,548 0 0
RODWELL (accepted)	2,485 0 0

For Alterations and Additions and Sanitary Works at Princes Road, Bermondsey, S.E. Mr. R. W. HOBDEN, Architect.
J. O. RICHARDSON, Albert Works, Peckham, S.E. (accepted) £330 0 0

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For Additions to Female Infirmary, Kingston Union.	Mr.
W. H. HOPE, C.E., Architect. Quantities supplied.	
Rochelle, Gover & Smith	£8,126 9 11
Yerbury & Sons	8,000 0 0
Turtle & Appleton	7,853 0 0
Cooke & Co.	7,617 0 0
Tompsett & Kingham	7,236 0 0
Wall & Co.	7,198 0 0
Allen & Sons	7,125 0 0
Gaze	6,980 0 0
Judd	6,958 12 6
Oldridge & Sons	6,949 0 0
J. O. Richardson	6,929 0 0
Dorey & Co.	6,871 0 0
Lane & Son	6,730 0 0
Botterill & Son	6,517 0 0
LORDEN & SON (accepted)	6,487 0 0
Jobbins	6,282 0 0
Jackson	5,454 0 0
For Alterations and Additions at Nos. 225, 228 and 230 Old Street, City Road, E.C., for Messrs. Alexander Lefever & Co.	
Gould & Brand	£1,763 0 0
Patman & Fotheringham	1,717 0 0
F. & H. F. Higgs	1,599 0 0
Earden & Co.	1,595 0 0
Appleby	1,504 0 0
J. O. Richardson	1,433 0 0
Thomas	1,421 0 0
Jarvis	1,235 0 0
LORDEN & CO. (accepted)	975 0 0
For New Amersham Grove Sunday School. Mr. GEORGE BARNES, F.R.I.B.A., Architect, 4 Great Winchester Street, E.C., and New Cross, S.E.	
Higgs	£1,801 0 0
Holloway	1,730 0 0
Nightingale	1,728 0 0
Houghton	1,703 0 0
J. O. Richardson	1,701 0 0
Gorham	1,686 0 0
Battley, Son & Holness	1,579 0 0
Coxhead	1,543 0 0
Scott	1,539 0 0
Leng	1,420 0 0

LONDON—continued.

For Alterations at No. 186 Rye Lane, Peckham, for Messrs. Dansie Brothers. Mr. E. J. STRAVENS, Architect.	
J. O. Richardson	426 0 0
Ham	390 10 0
Simpson & Co.	315 0 0
King & Son	250 0 0
Tunbridge	200 0 0
For Building Old Farm House Beerhouse, Battersea Park Road, S.W. Mr. W. J. INGRAM, Architect.	
White & Co.	£691 0 0
J. O. Richardson	628 0 0
Fabey & Son	590 0 0
Nightingale	583 0 0
Rouse	557 0 0
Sparks & Sons	545 0 0
Hibberd Bros.	521 0 0
Williams & Richards	513 0 0
Knight	507 0 0
Howlett	505 0 0
Mid-Kent Building Co.	478 0 0
For Erection and Completion of a New Sorting Office at Cherry Orchard Road, East Croydon, for H.M. Office of Works. Mr. JOHN TEBB, Architect. Quantities supplied by Mr. CHAS. W. STEPHENS.	
J. O. RICHARDSON, Peckham (accepted)	£1,589 0 0
For Alterations and Additions to No. 132 Rye Lane, Peckham, S.E., for Mr. West. Mr. W. BURRILL, Architect.	
Reynolds	£610 0 0
Gregory & Co.	498 0 0
J. O. RICHARDSON, Peckham (accepted)	458 0 0
For Heating Junior Mixed School and a Pupil Teachers' School, Burghley Road, Highgate Road, with Warming Apparatus on the Low-pressure Hot-water System.	
Maguire & Son	£482 5 0
Perkins & Son	480 0 0
Wenham & Waters	411 0 0
Jenkins & Son	410 0 0
R. Crane	381 0 0
G. Davis	375 0 0
Fraser & Fraser	374 0 0
Fraser & Son	372 0 0
Purcell & Nobbs	342 15 0



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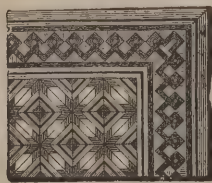
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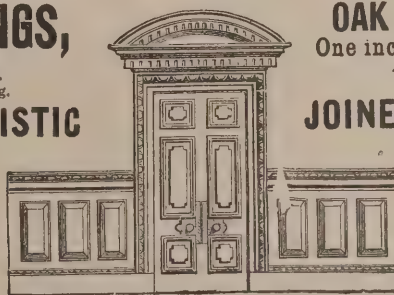
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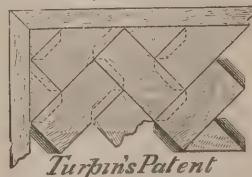
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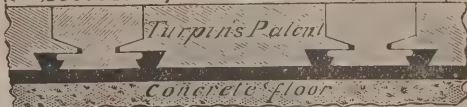
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For Enlargement of the Ecclesbourne Road School, Essex Road, Islington, by 400 Places, and the Provision of a Laundry Centre in Connection. Mr. T. J. BAILEY, Architect.

		A.
T. Boyce	£8,002 0 0	£150 0 0
Foster & Dicksee	7,689 0 0	170 0 0
S. J. Jerrard	7,558 0 0	157 0 0
McCormick & Sons	7,341 0 0	131 0 0
Reed & Son	7,350 0 0	175 0 0
Yerbury & Sons	7,325 0 0	225 0 0
E. Lawrance & Sons	6,945 0 0	170 0 0

For Construction of the Waterloo and City Railway.

Parry & Co.	£445,829 0 0
Pauling & Elliott	328,114 0 0
Pearson & Co.	253,170 0 0
W. Scott & Co.	245,555 0 0
J. T. Firbank	245,184 0 0
Price & Willis	230,835 0 0
J. MOWLEM & Co. (accepted)	229,064 0 0

For Works in Erection of Wardrobe and Needle-rooms, &c., at the Forest Gate School, Forest Lane, near Stratford. Mr. G. E. HOLMAN, Architect, 109 Bow Road, E.

Belham & Co.	£1,953 0 0
Jarvis & Son	1,837 0 0
C. L. Cole	1,831 0 0
Tinfield	1,780 0 0
Edmunds	1,742 0 0
T. H. Craig	1,598 0 0
J. Holland	1,597 0 0
T. White & Son	1,515 0 0
W. Watson	1,490 0 0
J. Pappin	1,395 0 0

For Works at Board School, Wilmot Street, Bethnal Green. Mr. T. J. BAILEY, Architect.

		A
S. & W. Pattinson	£5,269 0 0	£10 0 0
A. Reed & Son	5,213 0 0	8 0 0
Killby & Gayford	5,120 0 0	8 0 0
D. Charteris	5,112 0 0	7 0 0
E. Lawrance & Sons	4,847 0 0	8 0 0

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MAIDENHEAD THICKET.

For Building New House, Heathcourt Estate, Maidenhead Thicket, Berks, for Mr. Arthur Lawrence. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, S.W., and High Wycombe.

Bottrill, Reading	£1,535 0 0
Lovell, Marlow	1,533 0 0
Gibson, Wycombe	1,468 0 0
Simonds, Reading	1,462 0 0
Hunt, Wycombe	1,439 0 0
Flint, Wycombe	1,437 0 0
Reavell, Windsor	1,425 0 0
Smith, Lane End	1,398 5 0
Tucker, Reading	1,398 0 0
Martin, Maidenhead	1,385 0 0
Wellicome, Marlow	1,350 17 0

PARKSTONE (DORSET).

For Erection of Shelter, for the Parkstone Burial Board. Mr. H. F. J. BARNES, Architect, Poole.

J. Street, Parkstone	£227 10 0
Baker & Percy, Parkstone	170 10 0
W. Gray, Poole	153 10 0
HUXTABLE, Bournemouth (accepted)	145 0 0

PENYGELLI.

For Additions to Boys' School, Tabor Hill, Penygelli, for the Bersham U.D. School Board.

W. E. Samuel, Wrexham	£1,398 0 0
J. Hughes, Wrexham	1,300 0 0
W. Owen, Wrexham	1,275 5 2
W. Rogers, Wrexham	1,265 0 0
J. Whittingham, Wrexham	1,258 10 0
Harrison & Griffiths, Coedpoeth	1,172 0 0
E. Bird, Adwyrclawdd	1,150 0 0
E. Bradshaw, Gwersyllt	1,140 0 0
S. Moss, Coedpoeth	1,125 7 7

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For Dredging Channel between Lifeboat House and Public Baths, and Works in Connection with the Preparing of a Mooring Place and Dock for the Fishermen, for the Trustees of the Port of Poole.

H. C. Brixey, Newtown, Poole	£655 10 0
T. C. RIGLER, Longfleet, Poole (accepted)	395 0 0

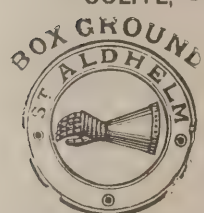
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Stevens	£2,495	0	0
Cowley & Drake	2,475	0	0
Turner & Co.	2,377	0	0
Gladwell	2,376	0	0
Dove & Co.	2,370	0	0
Waterman	2,339	0	0
MOODY, Folkestone (accepted).	2,295	0	0

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Forse	5,060	0	0
Clarke	4,995	0	0
Walters	4,982	0	0
Love	4,895	0	0
Brock & Son	4,790	0	0
Cowlin	4,763	0	0
Wilkins	4,669	0	0
Hatherly & Carr	4,587	0	0
Eastabrook	4,573	0	0
Humphry	4,489	0	0
Davis	4,475	0	0
Perrott	4,297	0	0
ROSSITER (accepted).	4,225	0	0
Downes	4,139	0	0
G. H. Wilkins	4,098	0	0

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For Construction of Roads and Sewers at Stratford, for the
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JACQUES, Architects, 2 Fen Court, E.C.

G. Wilson, Walthamstow	£459	0	0
D. H. Porter, Queen Victoria Street	389	0	0
T. Adams, Wood Green	335	0	0
J. JACKSON, Plaistow (accepted).	325	0	0

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W. B. Shephard, Penarth	£1,845	0	0
D. G. Price, Penarth	1,475	0	0
W. Williams, Pontypridd	1,350	0	0
Morgan & Groom, Cardiff	1,249	0	0
T. Bevan, Penarth	1,207	0	0
E. WILLIAMS, Whitchurch (accepted)	1,154	6	6

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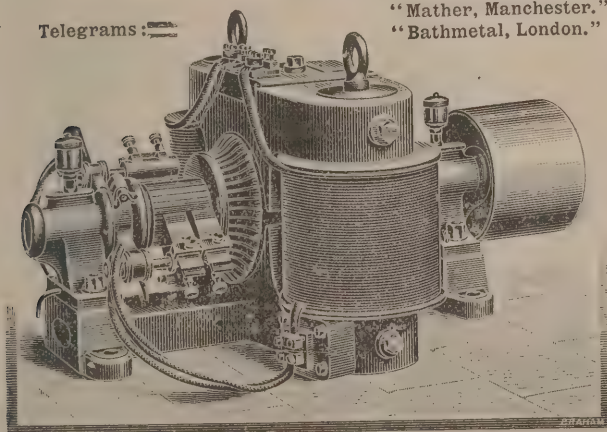
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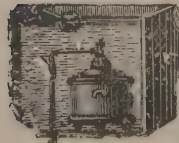
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J. WILLIAMS, Swindon (*accepted*).

TIVERTON.

For Reseating and General Alterations, Congregational Chapel, Tiverton. Mr. S. DEERING, Architect.

Carpentry, Painting and Decorating.

P. Pyle	£545	0	0
J. Deering & Sons	501	0	0
GRATER BROS. (<i>accepted</i>)	463	0	0

Mason's Work.

Deering & Sons	47	0	0
S. Manning	37	10	0
GRATER BROS. (<i>accepted</i>)	36	0	0
W. Gibbons	27	0	0

Smith and Ironmonger.

C. Nott	114	0	0
R. ELLIS (<i>accepted</i>)	112	0	0

TURRIFF.

For Building Dwelling-house and Shops, Turriff. Mr. WM. TEUNON, Architect, Fife Street.

W. Duguid, mason.

W. Teunon, carpenter.

J. Gillespie, slater.

J. Gibson, plasterer.

C. Duthie, plumber.

The total cost of the building is close on 900/.

WEST HAM.

For Construction of Band Stand in Canning Town Recreation-ground, Beckton Road, Custom House, for the West Ham Town Council. Mr. LEWIS ANGELL, Borough Engineer, Town Hall, Stratford.

Tawney, Plumstead	£275	10	0
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W. H. Lascelles & Co, Bunhill Row	270	0	0
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Hearle & Farrow, Cable Street	247	0	0
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G. Sharpe, Stratford	215	0	0
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T. E. Keen, Plaistow	195	0	0
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CO-OPERATIVE BUILDERS' SOCIETY (<i>accepted</i>)	190	0	0
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White & Son, Bow	189	18	0
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WORSBOROUGH.

For Building Girls', Boys' and Infants' Schools, with Out-buildings, Boundary Walls, and Master's House, at Worsborough Dale. Messrs. SENIOR & CLEGG, Architects, 15 Regent Street, Barnsley.

Accepted Tenders.

Higham & Porter, excavator, mason and bricklayer	£3,280	9	3
Exors. of W. Hammerton, carpenter and joiner	1,182	10	0
J. Snowden & Son, plumber and glazier	260	0	0
E. Fleming, slater	248	0	0
W. Guest, plasterer	132	10	0
W. Todd, painter	43	0	0

WE are asked to state that Messrs. Heelis & Wrightson, surveyors, of 26 Budge Row, Cannon Street, E.C., prepared the quantities for the Masonic Hall, Newcastle-on-Tyne, also for the Leyton Public Offices and Technical Institute, which was omitted in error when the tenders were forwarded.

TRADE NOTES.

MR. C. G. ROBERTS'S patent automatic horizontal rain-water separator, to which we have often drawn attention, was reserved "for further practical trial" by the judges at the Portsmouth exhibition of the Sanitary Institute in 1892. After rigorous trials they have recently awarded a medal to Mr. Roberts's invention.

THE master joiners of Newcastle, Gateshead and Tyneside have decided to grant an advance of a halfpenny per hour to the wages of the operatives.

AT St. Helens a threatened strike in the building trade has, it is said, been averted. The demands of the joiners have been referred to arbitration. The painters' dispute had previously been settled.

THE wife of Colonel Helsham-Jones, Redlands, Surrey, has presented a new eight-day turret striking clock with large external dial to Birstwith village in memory of the late Mrs. Greenwood, of Swarcliffe Hall, near Harrogate, which has been erected outside the village schools, Birstwith, the clock having been made and erected by Messrs. W. Potts & Sons, clock manufacturers, Guildford Street, Leeds.

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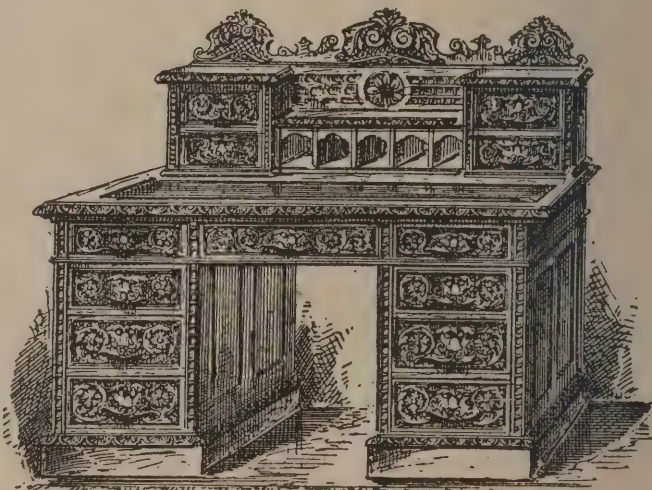
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Without Drawer and Pigeon-holes on Top, £10 10s.

THE contractors, Messrs. Eckersley, Godfrey & Liddelow, for the Piræus-Larissa Railway have sent a protest to the Greek Government, in consequence of the action of the Government with regard to the railway. The contractors, on the reasons upon which the forfeiture of their rights was sought to be based, say:—"These pretenses are both unproved and untrue. The stoppage of the work was not brought about by us, but by the Government. We never in any way declared to the Government that we had not the means to carry on the work, and our company neither is nor was bankrupt." The contractors now demand from the Greek Government the return of the caution-money of 2,000,000 francs in gold, the retentions made on work executed amounting to about 2,150,000 francs, damages for contingent profits, and various payments for material and rolling-stock, &c.

BUILDING AND BUILDERS.

THE report of the sub-committee appointed with regard to the Northern Hospital and the David Lewis Trust has been adopted by the finance committee of the Liverpool Corporation. The report recommends the Corporation to grant to the committee of the Northern Hospital a piece of land at the north-east end of Gibraltar Street, also a strip of land situate between the site of the present hospital and the Lancashire and Yorkshire Railway, and that the Corporation contribute 15,000*l.* towards the rebuilding of the Northern Hospital.

THE Glasgow city engineer has prepared a plan for the proposed People's Palace on the Green. From the designs, which have met with the approval of the committee of the Town Council appointed to consider the question, it appears that the Palace will consist of a front building, containing two large reading-rooms, a museum, and a picture gallery; and at the back there will be an extensive glass-covered winter garden. A site has been secured to the south-east of Greenhead Baths, and the principal front will face the London Street entrance to the Green. The total cost is estimated at 19,000*l.*

PLANS for a proposed addition to the infirmary are being prepared by Mr. Wild, architect, for the Penistone Board of Guardians.

IT is proposed to pull down the old drill-hall at Kirkgatehead, Irvine, and utilise the site for the erection of a hall in connection with the parish church.

ILLUSTRATIONS.

THE WEIRD LADY.

WEST-COOMB, SUSSEX.

WAREHOUSE, BIRMINGHAM.

VARIETIES.

THE Sheffield and Yorkshire Navigation Company have signed agreements with the Manchester, Sheffield and Lincolnshire Railway Company for the purchase of their water-ways. Immediate steps will now be taken to construct a ship canal from Sheffield to the sea, which has long been desired in the trading interests of the district.

AT Colne a Local Government Board inquiry has been held respecting the Local Board's application for sanction to borrow 11,500*l.* for gasworks purposes. It was stated that the Board purchased the gasworks in 1877, when the population of the town was 9,000, for 33,000*l.*, and had expended altogether 67,000*l.* upon the gas scheme. The works had been remodelled. The Board had provisionally accepted a tender for the new holders for 6,100*l.*, and as 2,500*l.* had been allowed for this purpose in the 11,500*l.* which formed the subject-matter of the inquiry, the Inspector reduced the gross amount by 1,100*l.*, allowing 6,400*l.* for the holder, and suggested that the Board should apply for the 1,100*l.* for certain works which they had contemplated to execute at the gasworks.

IT is reported that Lord Armstrong has purchased the Castle of Bamburgh, Northumberland, in order to restore it for a home for impoverished persons of cultivated tastes, and to endow it to the amount of 20,000*l.*

THE sub-committee of the finance committee of the Liverpool Corporation have presented a further report upon the scheme for the erection of a new hospital, to replace the present Northern Hospital, in connection with the bequest of the late Mr. David Lewis. They recommend the Council to make free grant of the site for the new hospital, and to contribute 15,000*l.* towards the cost.

ANXIETY is felt by the Leicester Corporation waterworks committee at a threatened water famine in consequence of the small rainfall. The reservoirs are 15 feet below the weir, and the deficiency amounts to some 580 million gallons. The

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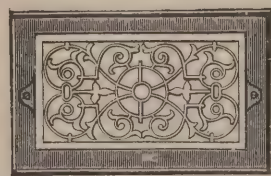
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water-supply for about six months has been cut off every night at eight o'clock, and although a fresh auxiliary supply of 400,000 gallons daily has been introduced, the stock of water is gradually diminishing. Several hundred workmen are now engaged completing pipes and temporary works from the site of a new reservoir which has been commenced, but the supply may have to be further largely reduced.

THE Birmingham City Council intend to borrow a sum not exceeding 34,000*l.* for the purpose of purchasing property in Woodcock Street and Little Ann Street, and for erecting 116 workmen's dwellings on the land so acquired.

THE extension of the Liverpool Electrical Overhead Railway to Seaforth has been inaugurated. The addition has cost 30,000*l.*

THE Fishery Board have agreed to vote a sum of 4,440*l.* towards the construction of a harbour at Collinston, a fishing village in the parish of Slains, and about a mile to the north of the mouth of the Ythan. The harbour is to be erected at a cost of 6,040*l.*, according to a design prepared by Mr. A. Melville, engineer, Aberdeen. The works will be carried out without delay.

THE waterworks committee of the Manchester Corporation have prepared their report for the year ended March 31. In reference to the Thirlmere works, it is expected they will be completed and ready for the delivery of the first instalment of water during the present year. Upwards of nine miles of hydraulic mains have been laid, and arrangements entered into for connections to 150 hoists, presses and other machines on private premises.

It is stated that Her Majesty's Office of Works, in which is vested the control of all the Crown lands abutting on Battersea Park, have entered into arrangements by which the site upon which the Albert Palace now stands, together with the small part of the grounds which has not been appropriated for other objects, will be disposed of for building purposes to a gentleman who has already erected residences in the immediate vicinity.

At the meeting of the Edinburgh Town Council the lord provost's committee reported completion of the negotiations with the North British Railway in regard to the proposed improvement of the Waverley Station and the rebuilding of the North Bridge. Lord Provost Russell said the great object of the Corporation had been to preserve the depth of the valley, while at the same time giving reasonable protection from the

weather to travellers. The railway company was not compelled to go on with these works. They had only got power to do so, and if they did begin they must complete the whole thing within seven years.

THE *Dundee Advertiser* says that while workmen were employed carrying out excavations in connection with projected alterations at Bullionfield, Invergowrie, they came upon a system of wooden piping under one of the oldest buildings. The pipes had been made by boring out the centre of straight trees, the hole being about 5 inches in diameter. The small end of each tree had then been fitted into the thicker end of the next. A length of the piping was cut out by the workmen, who found the wood to be in a good state of preservation. The line of pipes passes in an oblique direction through the present buildings, and seems to have no relation with them.

THE County Council have authorised the expenditure of 41,000*l.* for the improvement of Hanwell Asylum.

NEW CATALOGUES.

Horticultural Buildings.—"Photographs and Details of Horticultural Buildings and Heating Apparatus," by Messrs. Compton & Fawkes, of the Anchor Works, Chelmsford, is the title of a new catalogue published by Mr. B. T. Batsford, of High Holborn. In the preface it is stated that the catalogue contains photographs, sections, and a variety of details of a few of the large number of horticultural buildings which Messrs. Compton & Fawkes have carried out, and also particulars of heating apparatus, boilers, &c.; but they have hundreds of sketches of other buildings designed and executed by them, which they are always prepared to submit, as well as to meet clients in any part of the country, make surveys, give information or suggestions, and provide plans and estimates. Their experience, extending over many years, also enables them to design glasshouses which, while admirably suited to all horticultural requirements and containing the latest and most improved horticultural appliances, shall be in perfect architectural harmony with the adjacent buildings. Some out of many testimonials from clients will be found in the opening pages of the catalogue. About twenty-four excellent photographs are given of glass-houses, pavilions and winter gardens, as executed for various clients. As these have been photographed *in situ*, exteriorly and interiorly, the pictures are no mere bald reproductions, but are seen under actual condi-

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PATENT VENTILATING LIGHTS,
&c., &c.

VINCENT WORKS, WESTMINSTER, S.W.:

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Liverpool; 409 Keizersgracht, AMSTERDAM, &c

tions of use with the complimentary enrichment of their contents of rare plants, palms, flowers, &c. To many that part of the catalogue illustrating the sections of houses and varieties of glass-houses will be of practical value in conjunction with the previous picturesque views, and it is advantageous to see the good and effective buildings that can be had for a minimum of cost. Lesser details, moreover, have not been neglected, for instance, frames, plant protectors, lights, &c., also fittings for conservatories and greenhouses, iron gratings, staging of all kinds, lead glazing, &c. The important item of heating has also received ample attention, working plans of heating apparatus being shown, as well as apparatus, and among these details and illustrations of the patent horizontal tubular boilers, and the "Fawkes" improved slow-combustion apparatus for heating by hot water.

WE have received from Messrs. Hayward Brothers & Eckstein their new "Jhilmil" catalogue, descriptive of metal lath for fireproofing buildings, patented in Great Britain, the United States, Canada, New South Wales, Victoria, &c. A few weeks ago we referred to the merits of this system in a notice of the exhibit of Messrs. Hayward Brothers & Eckstein at the Building Exhibition. It is simply the substitution of iron or steel lathing instead of wood laths, the metalwork being of simple but peculiar design to furnish a perfect key for plaster—practically more than what is usually understood by the term "key," from the thorough incorporation of plaster or cement with the metal lathing into one homogeneous material. As a fire-resisting construction it is evidently more reliable than other heavier and more costly devices employed to render buildings, walls, ceilings, partitions, &c., fire-resisting, and moreover it can be used all over a building for floors, roofs, stairs, besides walls, leaving woodwork only necessary to be used for doors, window-frames, &c. It is about the lightest system of fireproofing that can be adopted, not costly in itself, and still less costly from time saved of labour in executing the job, and is also deserving of use from a sanitary point of view. We recommend our readers to consult the catalogue, as we have barely alluded to its merits and advantages, which are not to be judged of merely from the point of cheapness.

A summarised description of the manufactures of Messrs. Hayward Brothers & Eckstein will also be interesting to many as contained in their latest issued circular, giving information in regard of their variety of reflecting prism lights, &c., safety coal-plates, circular staircases, ventilating appliances, stable fittings, ornamental ironwork, &c. These we do not now

intend to refer to further, but would call attention to Hayward's patent cellar-flaps as one among other excellent specialties. These are glazed cellar-flaps, balanced so that they can be opened and shut gently without the exertion of any strength. A pair of glazed flaps are fitted in a guttered curb frame on three sides with movable bearing bar, for clearance of bulky packages if required. A hole is drilled and tapped in lowest front corner to attach pipe to drain. These flaps are balanced by springs in such a manner as not to reduce the opening through the gutter frame, and each pair of flaps is fitted with one guard bar, and a bolt through which a padlock can be passed. Checkered iron flaps are for use where light is not required; they are fitted in guttered curb frames, and each pair is fitted with guard bar, movable back bar, and bolt through which padlock can be passed.

Hot-water and Steam Heating.—We have received from Messrs. Lumby, Son & Wood, Limited, a catalogue of their wrought, welded and rivetted boilers for hot-water and steam heating. The catalogue is of handy and compact size, but nevertheless numbers nearly one hundred and fifty pages, dedicated to the illustration and description of these specialties, the illustrations amounting to perhaps three times as many as the number of pages. Their patent gold medal "Excelsior" boiler has won medals at every exhibition where shown. The following remarks given by Messrs. Lumby, Son & Wood may be of interest:—The large sale which this boiler has secured, comprising many thousands of boilers of every size, from 24 inches by 18 inches to 72 inches by 60 inches diameter, together with the universal approval wherever used, as shown by the numerous and valuable testimonials furnished by the most competent judges after years of trial, combine to place this boiler in the highest possible position for efficiency and economy both in fuel and amount of attention required. A saving of at least 25 per cent. in fuel alone is secured by the use of this boiler. In the construction of this boiler they believe that they have succeeded in combining all the requisite qualities of a thoroughly perfect boiler. It is made of best wrought-iron plates (5-16ths or 3-4ths or 1-2 inch thick, according to the size of the boiler), strongly and firmly welded together, and tested to a heavy steam or hydraulic pressure before leaving the works. The formation of this boiler is such that it gives the largest possible amount of heating surface, and receives the largest possible amount of the direct action of the fire on every point of its inner surface. It especially receives the most direct and intense radiant heat of



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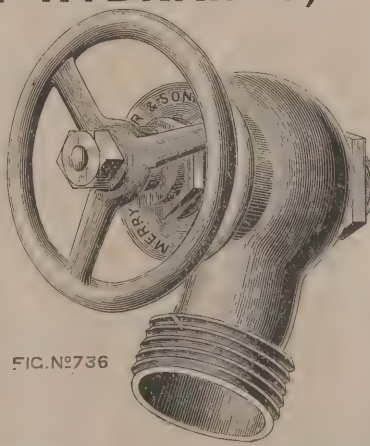
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the flame and heated gases upon its internal upper dome, thus greatly increasing and economising the heating power. The heated gases, &c., are compelled to pass through the smoke grating in the upper face of the boiler to pass down the front, under the midfeathers, and up the back of the boiler before they can reach the flue, thus travelling over the entire surface of the boiler, and exhausting all their available heating power before passing into the chimney. By these arrangements the greatest economy of fuel is secured, and it is confidently believed, if careful note of the consumption is observed, these boilers will be found to soon save their cost, as well as materially to decrease the labour required in attention thereto. The feeding-tube is through an aperture in the upper dome of the boiler, thus giving every facility for feeding from the surface, and, being independent of the smoke-flue, none of the usual annoyances from this source can arise. There being a large internal capacity for fuel, it may be left from twelve to twenty-four hours without attention, and the inner surface being smooth and straight, it is free from all liability of the coke lodging and leaving the fire hollow, an evil so frequently complained of in other boilers. The boiler, being circular in shape, will stand three times the pressure of horizontal or square boilers. This boiler is simple in construction, and has no complicated and troublesome flues to get out of order, hence its great durability. To the endless varieties of boilers illustrated we cannot do better than to advise an inspection of the catalogue, which contains incidentally much information in addition to quotations of price.

ART METALWORK.

MR. GEORGE WRAGGE, of Salford, has a reputation for his productions in art metalwork. The engraving is an illustration of the beautiful hammered iron railing for the head offices of the Yorkshire Penny Bank, Leeds (Messrs Perkin & Bulmer, architects), to whose designs this work has been made. In addition to the whole of the other metalwork, casements, door furniture, lightning conductor, &c., are being made by Mr. George Wragge for this building. Mr. George Wragge is also engaged at present in fixing his casements at the Higher Grade College, Huddersfield; Owens College, Manchester; Refuge Assurance Buildings, Manchester; new warehouse, Matthew Street, Liverpool; model cottages, Port Sunlight; Southport Infirmary; Glasgow Eye Infirmary; mansions at Eastbourne;

Kilbirnie, Ayrshire; Limpsfield Grange, Surrey; Oakworth, Yorkshire; Manor House, Ashby Folville, Leicestershire;



Abney Hall, Cheadle; Heverswood, Brasted, Kent; new house at Middleton; Albion Church, Ashton-under-Lyne; church at Limerick; several large houses outside Dublin and the mortuary chapel, Wigan.

THE Treasury have sanctioned a grant of 1,650*l.* to aid in the erection of a breakwater at Symbister, in the island of Whalsay, Zetland, N.B.

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SOME OF THE PRINCIPLES OF SANITARY BUILDING.

(Concluded from last week.)

WE have now "carcassed" in our building, but we have still several points for consideration. We must take care to preserve our roofs and walls from the enemies which will be continually attacking them—rain, wind and alternations of temperature, heat and cold. We must provide gullies to carry off surface water, and these, whether of metal, asphalt or other material, must be laid to proper inclinations, and have drips so as to prevent accumulations of water, or to spread the same over in thin layers, and with cesspits to be equal to carry off all the rain which may fall in time of storm; and to resist the action of the wind in blowing under or over the same, lead or cement flashings when metal is employed and filletings when asphalt is used, and these require carefully constructing at outlets. Having constructed our roofs and gutters we require to carry the water away from them and to safely discharge it at the level of the ground surface; this we do with either round or square rain-water pipes of lead, iron or copper manufacture. Care must be taken to avoid light materials for these; some are no thicker than paper, and are eaten through within a year or so after having been fixed. They should have ample heads, and should not be fixed with holdfasts against the walls; but should be disconnected from the same by projecting supports so as to leave a clear space of a few inches between the surface of the brickwork and themselves, and so prevent saturation of the brickwork. It is not wise to joint the pipes with any non-elastic putty, better to leave them with good sockets, so as to allow of contraction and expansion; leaky joints allow of water soaking into the walls, and when once the brickwork is thoroughly wetted it takes some time to dry out again. A word of additional caution—rain-water pipes should never under any circumstances be directly connected with the drainage. The water should be discharged through shoes into glazed earthenware channels, and from thence conducted to trapped gullies, which latter should be carefully jointed into the drainage system.

A smoky chimney is an intolerable nuisance, and produces an insanitary condition of things; care must therefore be taken in the construction of the same; they should be carried well up over roofs and shielded from reflex action of winds by chimney-pots of approved design; their interiors should be

rendered smooth with cow-dung parqueting, not with cement, which scales off under the influence of heat. They should be well built in thick brickwork or cement so as not to be cooled down and the heat which causes their ascensive power to be conducted away; it would be well for these reasons to keep them in the middle of the house if possible, and to cement their exteriors and not put architectural embellishments in such positions as may interfere with the wind getting away or forming eddies round them.

Having formed the shell of our structure we proceed to divide it up into rooms. Any cause which produces discomfort is insanitary in construction. Sound passing from one room to another is an intolerable nuisance, dirt is productive of vermin, an insanitary evil. Our partitions are necessarily somewhat thin. The best materials for their construction are good hard well-burnt stocks, blue, Welsh or Staffordshire bricks or iron uprights filled in each side with expanding metal and plastered over, and, if we can afford it, with slag wool laid in the hollow space. This arrangement prevents sound penetrating and damp arising. The usual practice is to use wood quarterings, sometimes filled in with sawdust; nothing is more insanitary. These partitions contain dust and air (partly stagnant); they are the happy hunting-ground of vermin, they readily allow sound to pass and they are easily burnt away. Partitions and walls should not be finished next floors with wood, but with cement skirtings, the simpler the better; the less resting-places for dust and the intrusion of filth and vermin the more sanitary the house becomes.

The space being divided into rooms, we must now floor and ceil them; we are actuated by the same philosophical considerations in so doing as we have before stated. We want non-absorbent materials, non-conductors; facility for cleansing and keeping clean.

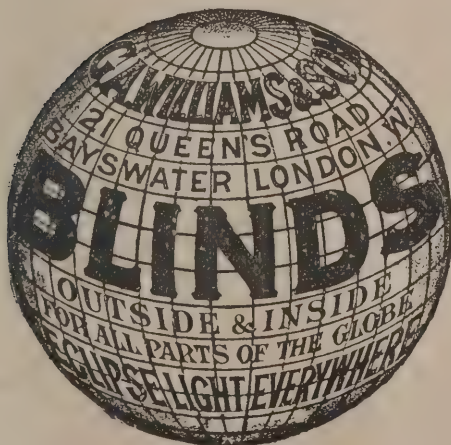
As with partitions, so with floors, the present practice in this country, from a mistaken idea of economy, is to construct our floors with wood joists with wide apertures between them, lath and plastered underneath, and covered above with soft wood boarding having imperfect joints. The thickness of such floors averages about 12 inches. The insanitary consequence of such construction is that dirty air filled with dust and dirt penetrates the plaster, fills the interstices between the joists, rises through the boarding and joints and permits sound to ascend, so that often voices, and even conversation, can be heard with distinctness in the rooms over. Take up a board in the floor of a house which has been built but a

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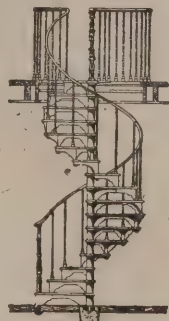
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little while, and you will see the dust clinging to plaster and the joists. Plaster allows dirt to filter itself through its substances, and the position of every joist can be discerned from this cause in many ceilings. Add to this that the wind passes with equal readiness, and sometimes with such velocity and force as to raise the carpets. Whilst corridors for beetles, rats and mice are carefully constructed for the incursion and playgrounds of these and similar pests, fire plays easy havoc, I need scarcely add. Putrefying filth fills up the joints formed by the shrunk joints of the boarding. Good sanitary construction would be consulted by the employment for the upper rooms of steel joists, the spaces between being filled in with salt-glazed terra-cotta bricks and coke-breeze concrete, or with some of the numerous patented fittings shown in the exhibition. The floors should be covered with a solid floor, having close joints carried closely up to walls and partitions. The thickness of these floors would average 6 inches, or half of the wood flooring, and it would be well for further prevention of sound if the wood were laid on asphalted felt or on slag wool. A word of caution in using slag wool—it must not be pressed into compact masses. You know as long as wadding is new it keeps the body warm, from its interstices being filled with the air which they contain; compress it and its efficacy departs; so with slag wool. The ceilings will be plastered in the usual manner, preferably with gauged plaster or Keene's cement on Portland cement grounds. The diminished thickness of wall and ceiling will allow a considerable saving in the height and consequent cost of building, so that economy will be really consulted whilst sanitary construction will be insured and danger from fire considerably abated. In the basement, except in sculleries and larders, wood-block flooring laid on bitumen should be used. Tiles and stone, being relatively porous, admit deposits of damp and abstract the heat of the body, whilst solid construction, as suggested, prevents the possibility of ground air or water permeating the house. In more costly-constructed dwellings parquet floorings could with advantage be adopted, and the bad usage of washing floors be abolished, "frottage" or cleaning with paraffin or bees-wax being substituted.

The construction of staircases should be also of concrete, with iron embedded. Stone, besides being cold, is certainly not fire-resisting, and as the object of a staircase is to give easy access to rooms, and egress to street, it ought not to be used in their construction—better to build them of solid wood than of the fragile and easily-combustible materials of which they are

generally formed. Care should be taken that they are well supported with fire-resisting arrangements.

As regards our window-space it should be proportioned to our rooms, and as the retention of light as well as heat is of great importance to the comfort of our homes, enhancing as it does the cheerfulness of our homes, due attention should be given to this detail of sanitary construction. Air in contact with surfaces of glass easily cools; when the walls of our rooms are comparatively warm the glass of the windows is cold, and is often found covered with condensed vapour of the air, and even frozen on its surface. Sir Douglas Galton suggests that adequate light in our climate is not obtained with less than 1 square foot of window surface to about 100 cubic feet of the contents of the room. Light, we know, is considerably modified and affected through the medium in which it passes, and glass is no exception; the thicker it is (if clear) the better. Thin glass is a good conductor of heat. Double windows are of great service, both in retaining heat and preventing sound. The nervous system is much endangered by draught and noise, and when this occurs I consider it is an unsanitary building.

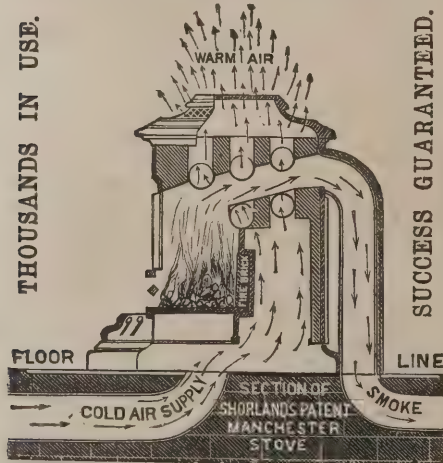
In conclusion, be it remembered, it is not sufficient to simply build well if we place our building in impure surroundings; this will surely negative all our efforts to secure sanitary work. Pure air prevents the decay of organic bodies, and Dr. Angus Smith draws this syllogistic inference therefrom. He says, "If these bodies do not putrefy it is because the air is pure; if pure air does not allow of putrefaction, and if putrefaction is connected with disease, then pure air will prevent all those diseases which are capable of being carried through the means of air." We must, therefore, as far as possible endeavour to secure a sufficiency of air and light around and between our buildings. We must above all avoid overcrowding, either in building or in occupation of the buildings when erected. Overcrowding invariably occasions increased sickness and mortality. Pure air and undimmed sunshine are two of the best prophylactic agents known. Delicate vegetable organisms suffer in proportion to the deterioration of the atmosphere in which they are placed, and you may be quite sure that when this occurs the same deleterious influences are at work affecting your own health, sapping your own energy and laying the foundation for future illness.

Let me caution you as to boiling and filtering your water. A simple filter can be always made with an ordinary flower-pot.

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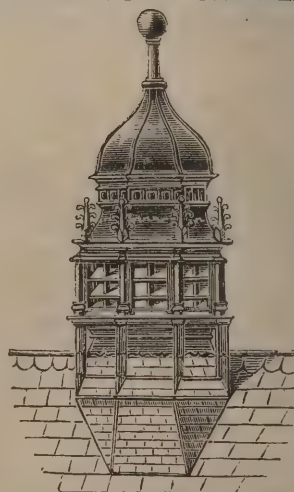
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makes perfection, but that perfection is not a little thing." If I have succeeded in awakening in you an interest in the subject I shall be well contented and amply rewarded. It is a subject which well repays a little time and study, and which, when understood and applied, tends much to insure not alone our own happiness, but that of others who are near and dear to us. I dismiss the subject with the Latin aphorism which runs thus, "Non est vivere sed valere vita" ("Life is not merely to live, but to have good health"), and if you wish this, you must deserve it by making it part and portion of your everyday existence to preserve all your environments sweet, pure and clean, so that the soil on which you rest is undefiled, the air in which you live is unpolluted, the water which you drink is uncontaminated, and the food which sustains you is not only well selected and cooked, but kept from all morbid and improper influences.

CONTRACTING IN GLASGOW.

THE annual general meeting of the Glasgow Master Wrights' Association was recently held, when Mr. Archibald M'Farlane was elected as president, Messrs. A. Forbes and J. Herbertson, vice-presidents, and Mr. J. L. Selkirk, secretary. At the request of the directors, Mr. Wm. Howatt, president of the Institute of Measurers, attended, and delivered an address on measuring, past and present. He referred to some changes affecting the question of measurement which had taken place during the last fifty years in the construction of dwellings. There was now less similarity in the style and detail of work, and more variety in the fittings. Bedrooms were in most tenements made smaller than formerly, but the labour of their construction was the same. A comparison was drawn between the minute detail with which buildings were now measured and the simpler and shorter modes formerly adopted. From examples given it appeared that though the cost of a tenement had only increased 12 per cent. since 1840, the number of items or separate charges in a complete set of schedules had increased by 128 per cent. This great advance in the measurer's work had arisen from several causes. Labour now bore a larger proportion in the cost of a building than it did fifty years ago, and therefore it was expedient that the contractor should have separate and distinct charges for special labour in place of including such labour with the material. The keenness of competition had made it imperative that the party offering should have as much information regarding the

exact nature of the work which he would be required to perform as it was possible to supply. In pricing schedules contractors had now more rates to apply, but there was less calculation necessary to discover the rates. Less was left to hazard, and there was less need of studying plans. It was possible, however, that the elaboration of detail in measuring might have had effects not so beneficial. It had perhaps assisted to increase the keenness of competition, and to cut down prices quite as much as to induce excellence in the work executed. It may also have been instrumental to some extent in putting one contractor upon the same level with another, even although the two might be at the opposite poles as regards experience, capability and commercial position. Mr. Howatt concluded by expressing the hope that the negotiations about to be entered upon by a joint committee of architects, measurers and wrights for the framing of a standard mode of measuring wright-work might speedily be brought to a successful and happy termination.

REGISTRATION OF PLUMBERS.

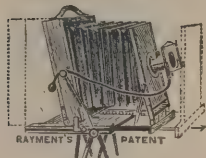
THE quarterly Court dinner of the Plumbers' Company was held at Fishmongers' Hall, Sir Stuart Knill, master, presiding. Among the company were Sir John Leng, M.P., Sir J. Crichton-Browne, M.D., Mr. W. P. Byles, M.P., Brigade-Surgeon Myers, Mr. Brudenell Carter, Alderman W. Lees McClure, J.P. (Lancashire County Council), Alderman R. Hind, J.P., Colonel Bristow, Dr. E. B. Forman, L.C.C., Dr. J. G. Glover, Dr. Reginald Dudfield, Mr. N. H. Helme (Lancashire County Council), Mr. Philip Wilkinson (renter warden), Mr. Charles Hudson (chairman, Board of Examiners), Mr. A. à Beckett, Mr. S. S. Hellyer and Mr. George Jennings.

The Master, in proposing the loyal toasts, said that on all occasions when health was in question the Queen manifested her interest in the subject. It was to the Prince of Wales specially that the Plumbers' Company owed the spirit with which its members had thrown themselves into the work of registration. His Royal Highness's illness, brought on by bad domestic arrangements and want of scientific knowledge in plumbing, first determined them to devote their efforts to the improvement of sanitation.

Mr. W. H. Bishop, past master, proposed "The Houses of Parliament," and in the course of a few remarks expressed the hope that the Plumbers' Registration Bill would pass into law within a short time.

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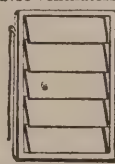
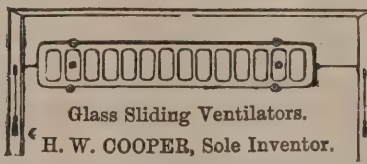
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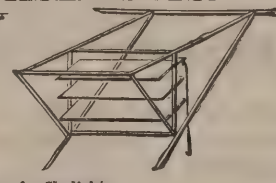
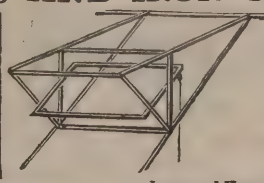
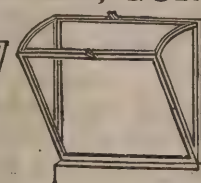
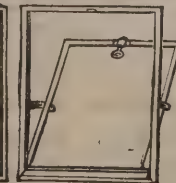
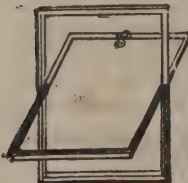
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Sir John Leng, in responding for the Houses of Parliament, said he trusted that all present were supporters of the Bill to which reference had been made that evening. From his position on the opposite side of the House he could bear testimony to the assiduity and the diligence with which Mr. Knowles, into whose charge the measure had been put, attempted to engineer it through the House of Commons. He had not succeeded, however, and few of our amateur legislators, of whom he (Sir J. Leng) was one, did succeed. The fact was that the whole arrangements at Westminster were entirely a work of contrariety. Unfortunately that was a result of our system of party government. He trusted that one of the earliest things which would be done would be to alter the rules of procedure, so that it would be really possible to pass such a measure of great public importance as the Plumbers' Registration Bill.

Mr. Byles, M.P., in proposing the toast of "Municipal and County Authorities," said that his own knowledge of local government was chiefly connected with a large borough corporation in the North of England—the borough of Bradford. He had found there a great community of over 200,000 souls, which was extremely well managed by a voluntary body of its citizens elected from year to year. He had always thought—with the vanity which characterised Northerners—that the people of Bradford were considerably in advance of the benighted citizens of the Metropolis. It might not be un-instructive to show how the matter struck a Northerner. He came to London and he found that much vaunted County Council. After referring to what had principally struck him, he proposed the toast, coupling it with the name of Alderman McClure, of the Lancashire County Council.

Alderman W. L. McClure, in acknowledging the toast on behalf of his fellow representatives of municipal and county bodies, thanked them for the honour they had done them.

The Master, in proposing "The Medical Profession and Sanitary Science," said that one great object which the Plumbers' Company had in view was to prevent the necessity of going to doctors. It seemed therefore rather a contradiction that he should rise to propose the health of the doctors. That, however, he had risen to do, and he could say that that great profession was at one with the Plumbers' Company in endeavouring to dissipate those fumes of typhoid which arose from bad plumbing. Its members were also great assistants in the work which the Plumbers' Company had undertaken. It was therefore with the greatest pleasure that he remained in

Rome to take part in the great Medical Congress which recently met there. The medical profession, especially in England, was one to which all ought to look with the greatest respect. By plumbers particularly were they honoured and respected. It had throughout their work assisted them most thoroughly, and he might say that if it were not for the assistance which, both by word and by deed, they had derived from the medical profession they would scarcely be able to carry out their work. It was, however, sanitary science to which more immediately perhaps they looked in their registration and class work. Their efforts had been directed to giving a certain knowledge of sanitary principles to those who worked in the craft over which they, as a Company of the City of London, had the honour of presiding. It was to sanitary science that they especially looked, and the people generally looked, for protection against the ills of bad drainage and other troubles from which they had been long suffering. He might say that the result, so far as plumbers were concerned—that was to say, the result of the study of theoretical and practical plumbing—was an enormous improvement in the position and the studies of their men. They had endeavoured to establish classes throughout the country for scientific and practical plumbing, and in taking upon themselves that work they had paid their respect and homage to sanitary science. He took it that that great study which they were endeavouring to introduce among their own men was a reverence which they, like all men, delighted to pay to that great science of sanitation. He gave them the toast most heartily and most cordially, and he coupled with it the name of one who from the first had devoted himself to what he knew to be a necessity of the present time—the work which they had specially undertaken. He gave them the name of a gentleman known by all in his profession and in connection with sanitary science, the name of Sir James Crichton-Browne.

Sir J. Crichton-Browne, in replying, said that the labours of the Plumbers' Company had largely conduced to the benefit of the public health. It was dealing with matters which peculiarly appertained to an age in which large towns were extending their arms in all directions like huge octopi, and facilitating more and more the spread of malignant diseases. It was the pride of the medical profession that it was always striving to restrict its field of operations, and in that work it found the Plumbers' Company one of its greatest aids.

The Master, in proposing "Our Guests and those who work with us to promote Technical Education and Sanitation," said

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that the Plumbers' Company were there themselves as guests in one sense, because they had no hall of their own and were always forced to go to hotels or public places of that kind. They, therefore, had every reason to be grateful to those who allowed them the use of that magnificent hall. He especially owed a debt of gratitude to the Fishmongers' Company. He happened to be alderman of that ward as well as Master of the Plumbers' Company, and he was proud to reckon among his children the Worshipful Company of Fishmongers. Though children, they were perfectly independent of himself, and it was entirely owing to their kindness that the hall was placed at the disposal of his Company. There were present many guests whom it was their delight to honour. In connection with that toast he wished to propose the name of a gentleman who represented there the Prime Warden and Court of the great Company in whose hall they were then assembled—Mr. J. A. Travers.

Mr. J. A. Travers, warden of the Fishmongers' Company, in responding, said that he much regretted that the Prime Warden was unable to be present. He thanked Sir Stuart Knill for the extremely kind manner in which he had referred to the little service the Fishmongers' Company had been able to render his Company, and assured him that all that he had said should be conveyed to the proper quarter. At the same time, he felt that there was a corresponding advantage in having the Plumbers' Company in their hall, in the fact that plumbers would surely not venture to trust themselves in a building which was not in a strictly sanitary condition.

Sir John Leng proposed "The Plumbers' Company." He thought that all would agree with him that the evening would be incomplete if they did not drink in a more special manner to the health of their hosts, the Plumbers' Company having at its head a master who had just filled the highest civic position in the country.

The Master, in acknowledging the toast, said that he hoped as the Master of the Plumbers' Company, to have increasing opportunities of sacrificing himself in the interests of its work.

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THE HEALTH OF RANGOON.

EVERYONE who has the welfare of Rangoon at heart will be pleased to learn that so competent an authority as Dr. Grant, the professor of hygiene at the Madras Medical College, prophesies in his recent work on hygiene that Rangoon will take the lead of all Indian cities in healthiness. In his book on "Indian Hygiene" he devotes a considerable space to the importance of proper sewerage systems. Rangoon is the only city in the Indian empire which can boast of a scientific system of drainage which fulfils all the requirements of sanitarians; but in Rangoon, as we all know, this system is only applied in part as yet. The following is Dr. Grant's account of the history of sanitation in Rangoon:—"Previous to 1873 the land was honeycombed with cesspools, and the drinking-water correspondingly polluted. Thereafter the cesspools were closed by order and the night-soil collected by carts and thrown into the river. This horrible system obtained till 1890, when

the Shone system was adopted at a cost of more than 20 lacs of rupees. With thorough conservancy of dry refuse, a good water supply, and efficient subsoil drainage supplementing the effect of such a system of sewage removal, there is little doubt that this great and rapidly increasing city will take the lead in healthiness from her more backward and poverty-stricken Indian neighbours."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 7496. George Harling, for "Improvements connected with sliding windows or window-sashes."
- 7525. James William Pitt, for "Improvements in chimney cowls."
- 7547. William Bewick Quelch, for "Improvements in sash-windows."
- 7572. Emil Hollandes, Charles James Leather and Carl Bencke, for "An improvement in door-locks."
- 7580. Roger Threlfall, for "A new or improved method of hanging window-sashes, for the purpose of facilitating the removal of same when necessary for cleaning, painting or repairing."
- 7632. George Adams, for "Improvements in sashes and sash-fasteners."
- 7654. Thomas Sherwood Smith and Arthur Harold Smith, for "A cheap and improved method of raising and lowering window-sashes and other objects."
- 7665. Samuel Trueman Potter, for "Improvements in and relating to sash-windows."
- 7732. George Webb, for "An improved method in the construction of revolving-cowls for chimneys."
- 7847. Thomas Powditch Inge, for "Improvements in sash-fasteners."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

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TENDERS, ETC.

* * *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

CONTRACTS OPEN.

BARNSELY.—May 16.—For Building Three Shops and Houses. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

BETHNAL GREEN.—May 17.—For the Supply and Delivery of Guernsey Granite Pitchings. Mr. F. W. Barratt, Surveyor, Vestry Hall.

BIRMINGHAM.—May 19.—For Additions to Workhouse Laundry. Mr. W. H. Ward, Architect, Paradise Street, Birmingham.

BODMIN.—May 19.—For Building Residence, School Buildings, &c. Mr. William J. Jenkins, Architect, Bodmin.

BRADFORD.—May 21.—For Building Higher Grade Board School. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

BRIGHTON.—May 11.—For Providing and Fixing Cast-iron Fences, Entrance Gates, &c., round Recreation Ground. Mr. F. J. May, C.E., Town Hall, Brighton.

BRISTOL.—May 15.—For Additions to National Schools. Mr. William L. Barnard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

BRISTOL.—May 28.—For Building Board School. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BURY ST. EDMUNDS.—May 11.—For Erection of a Post Office. Postmaster, Bury St. Edmunds.

BUXTON.—May 30.—For Construction of a Storage Water Reservoir. Mr. Joseph Hague, C.E., Town Hall, Buxton.

CAMBERWELL.—May 15.—For Construction of an Underground Convenience. Mr. O. S. Brown, Works Department, Vestry Hall, Camberwell.

CAMBERWELL.—May 15.—For Extension of General Works Connected with the Sewers and Drains of the Parish. Mr. C. William Tagg, Vestry Hall, Camberwell.

CAMBERWELL.—May 15.—For Paving various New Streets. Mr. C. W. Tagg, Vestry Hall, Camberwell.

CHESHUNT.—May 19.—For Building Six Villas. Mr. James Bunce, Turner's Hill, Cheshunt.

CHESHUNT.—May 21.—For Alteration of and Addition to Reservoir. Mr. A. Collingwood Lee, St. Mary's Hill, Cheshunt.

CHISWICK.—May 16.—For Sewering and Making-up Prebend Gardens, St. Mary's Grove, Gordon Road and Eunice, Road. Mr. Arthur Ramsden, Vestry Hall, Tottenham Green, N.

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DYNAS POWIS.—May 28.—For Building Villa. Mr. W. H. Dashwood Cople, Architect, 1 St. John's Square, Cardiff.

EASTBOURNE.—May 24.—For Building Police Station and Cottages. Mr. W. C. Field, Borough Building Surveyor, Town Hall, Eastbourne.

ELTON.—May 24.—For Extension of All Saints Schools. Mr. D. Hardman, Architect, Silver Street, Bury.

ESKDALE.—May 14.—For Building House. Mr. John Butler, Architect, Barrow.

FLEETWOOD.—May 19.—For Building Electric-Lighting Station. Mr. Joseph Tildsley, Town Hall, Fleetwood.

GALASHIELS.—May 14.—For Building Post Office. H.M. Office of Works, Edinburgh.

GAYTON-LE-MARSH.—May 14.—For Building Chapel and Schools. Mr. J. H. Andrews, Gayton-le-Marsh.

HOLMFIRTH.—May 21.—For Additions to Police Station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

HOOLE.—May 11.—For Repairs to Workhouse. Mr. R. C. Davies, Architect, 24 Newgate Street, Chester.

IPSWICH.—May 22.—For Additions to Board School. Mr. T. W. Cotman, Architect, Northgate Street, Ipswich.

LLANGFNI.—May 22.—For Erection of County Buildings. Mr. J. L. Griffiths, Clerk of the Peace, Holyhead.

LLWYNPIA.—May 12.—For Building Church and Hall. Mr. E. M. B. Vaughan, Architect, Cardiff.

NEWNHAM-ON-SEVERN.—June 9.—For Additions to National Schools. Mr. W. Spence, Architect, Cinderford.

NEWPORT.—For Completing Tower of St. John's, Maindee. Messrs. Seddon & Carter, Architects, St. Mary Street, Cardiff.

OLD PITSLIGO.—May 16.—For Additions to Manse. Messrs. Ellis & Wilson, Architects, 181A Union Street, Aberdeen.

PENDLETON.—May 17.—For Additions to Schools. Mr. Tom Cook, Architect, 39 Victoria Buildings, Manchester.

PONTYPOOL.—May 15.—For Building a Club. Mr. A. H. Babbidge, George Street, Pontypool.

POOLE.—May 15.—For Drying Closet for Hot-Water Supply to Baths. Mr. H. F. J. Barnes, Architect, Towngate Street, Poole.

PORTRUSH.—May 17.—For Building National Schools and Residence. Mr. Henry Seaver, Architect, 128 Royal Avenue, Belfast.

PORTSMOUTH.—May 16.—For Building Workshops at Schools, for the Guardians, and Electric Fittings for Offices. Messrs. Rake & Cogswell, Architects, Prudential Buildings, Portsmouth.

PUDSEY.—May 17.—For Building Residence. Mr. C. S. Nelson, Architect, 10 Park Row, Leeds.

SOUTHAMPTON.—May 22.—For Building Engine House, &c. Mr. W. Matthews, Waterworks Engineer, Southampton.

SOUTHEND-ON-SEA.—May 16.—For Heating with Hot Water New Technical School and Institute Buildings. Mr. W. Y. Hobbs, Clarence Road, Southend.

SOUTHWARK PARK.—May 22.—For the Erection of Public Conveniences. Mr. H. de la Hooke, Clerk to L.C.C., Spring Gardens, S.W.

SOWERBY BRIDGE.—May 17.—For Additions to Christ Church. Messrs. Horsfall & Williams, Architects, Halifax.

STOCKTON.—May 21.—For Building Infants' Department to Board School, Mill Lane. Messrs. Weatherill & Whipham, Architects, 59 High Street, Stockton-on-Tees.

SUTTON, SURREY.—May 21.—For External Repairing and Painting Main Building of Brighton Road School. Mr. Church, William Street, Woolwich.

SWANSEA.—May 22.—For Building Board School. Mr. G. E. T. Laurence, Architect, 181 Queen Victoria Street, E.C.

SWINDON.—May 21.—For Building Technical Schools. Mr. T. B. Silcock, Architect, Milsom Street, Bath.

TOXTETH PARK.—May 15.—For Supply of Portland Cement. Mr. John Price, A.M.I.C.E., Boar's Yard, Lark Lane, Toxteth Park.

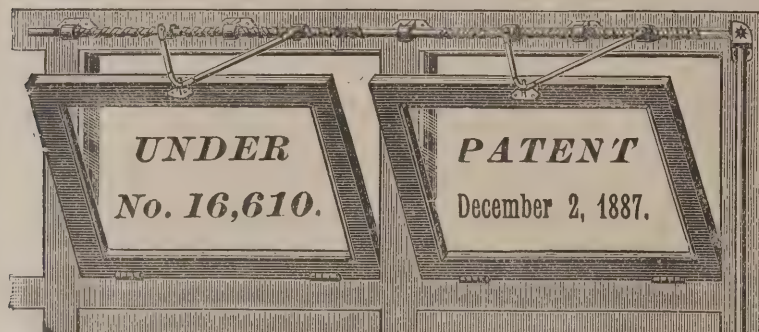
UCKFIELD.—May 19.—For House and Additions to Grammar School. Mr. H. Curtis Card, Lewis.

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WIMBLEDON.—May 15.—For Construction of a Surface Water Outfall, the Erection of an Ejector Station, Air and Rising Mains, and a Short Length of Sewer. Mr. C. H. Cooper, A.M.I.C.E., Broadway, Wimbledon.

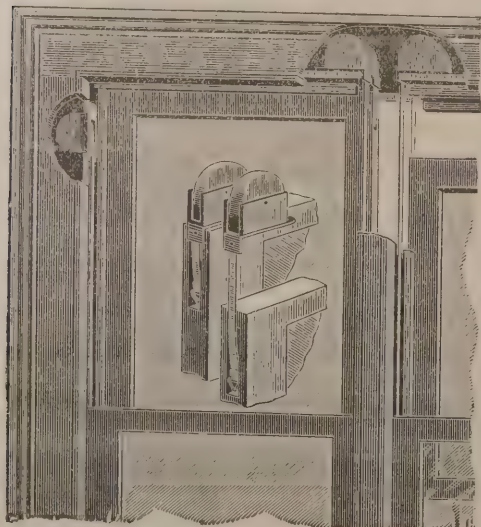
WARENFORD.—May 19.—For Alterations to Church. Mr. Mr. George Reavell, jun., Architect, Alnwick.

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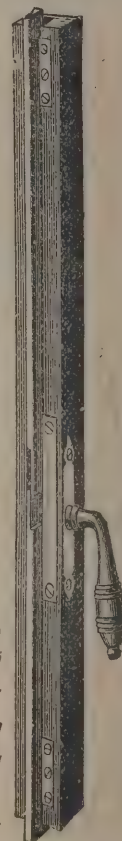
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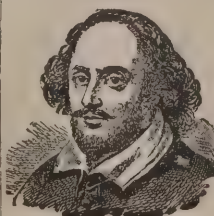
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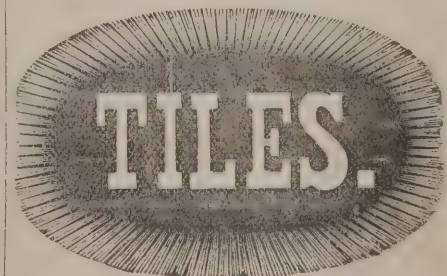
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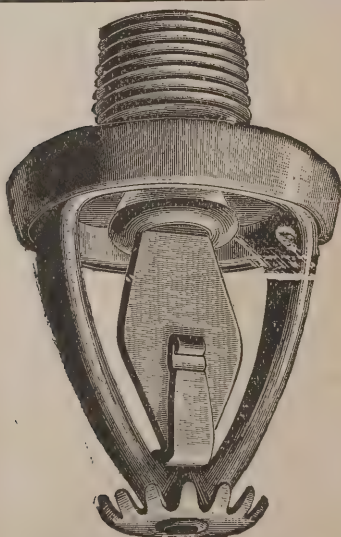
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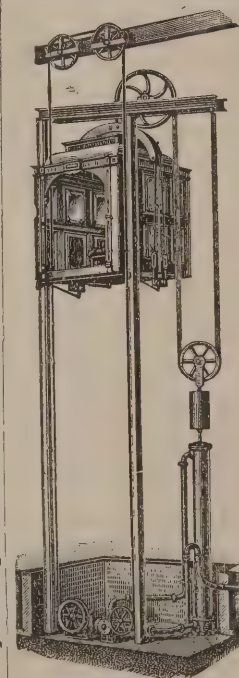
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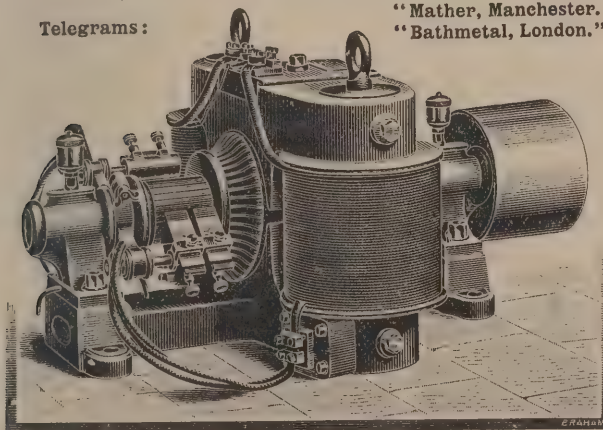
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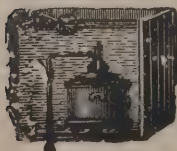
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FENTRE.			
For Construction of Sewers. Mr. W. J. JONES, Surveyor.			
<i>Cwmpark.</i>			
D. Evans & Sons, Penygraig	£3,198	14	7
R. J. Mathias, Pontypridd	1,874	19	0
W. Jones, Porth	1,720	11	6
W. CHAPLIN & CO., Porth (accepted)	1,628	16	10
<i>Eirw.</i>			
W. Chaplin & Co.	71	14	8
D. Evans & Sons	69	4	6
W. JONES (accepted)	51	3	11
<i>Upper Eirw and Britannia.</i>			
D. Evans & Sons	151	12	3
W. Jones	120	16	3
W. Chaplin & Co.	117	12	6
T. STREET, Pentyrch (accepted)	101	9	5
<i>Porth.</i>			
W. Chaplin & Co.	39	8	10
D. Evans & Sons	36	17	6
W. Jones	30	7	3
<i>Clydach Vale.</i>			
D. Evans & Sons	46	6	6
W. CHAPLIN & CO. (accepted)	40	18	0

PONTYCYMMER.			
For Additional Accommodation for 352 Children at the Ffaldau Schools, Pontycymer, for the Llangeinor School Board. Mr. PHILIP J. THOMAS, Architect, Bridgend.			
J. Rees, Ynysybwl	£4,700	0	0
W. Lissaman, Merthyr	4,655	0	0
T. Roberts, Pontycymer	4,450	0	0
P. Gaylard, Bridgend	4,425	0	0
F. Small, Barry	4,270	0	0
C. James, Porthcawl	4,000	0	0
RATTRAY & JENKINS, Ogmores Vale (accepted)	3,863	0	0

READING.			
For Works to Sewage Pumping Engines at Blake's Lock. Mr. ARTHUR E. COLLINS, Borough Engineer.			
Pollitt & Wigzell, Sowerby Bridge	£75	10	0
Wood Bros., Sowerby Bridge	66	0	0
Mather & Platt, Limited, Manchester	66	0	0
Teague & Chew, Cinderford	54	10	0
Lancaster & Tonge, Pendleton	49	12	0
Phillips & Son, Reading*	47	0	0

* Recommended for Acceptance.

PRESTON.			
For Building House at Wrigan House Farm, Sharoe Green Lane, Fulwood, for the Guardians of Preston Union.			
Turner, Broughton	£619	17	6
Fazackerley, Ashton	618	13	4
T. Strickland, Penwortham	610	0	0
Swarbrick, Ashton	600	0	0
Baldwin, Preston	600	0	0
T. Baines, Preston	599	16	4
Lucas, Preston	594	16	6
M. Shorrocks, Preston	588	10	0
J. Counsel, Preston	586	15	9
J. Marland, Preston	585	15	8
CARTER BROS., Preston (accepted)	567	0	0

RUSHDEN.			
For Building Factory at Rushden, for Messrs. Austin & Bond. Mr. H. H. PACKER, Architect, Wellingborough.			
W. Penn, Wollaston	£1,750	9	10
H. Dorman, Wellingborough	1,625	0	0
F. Henson, Finedon	1,620	0	0
H. Lovell, Rushden	1,598	0	0
T. Swindall, Rushden	1,590	0	0
C. Bayes & Son, Rushden	1,570	0	0
H. Sparrow, Rushden	1,550	0	0
T. Chapman, Finedon	1,515	0	0
H. Knight, Rushden	1,495	0	0
T. Willmote, Rushden	1,485	0	0
T. & C. Berrell, Rushden	1,436	0	0
R. MARRIOTT, Rushden (accepted)	1,380	0	0
T. Fishburn, Kettering	1,325	0	0

WALTHAMSTOW.			
For Erection of Shops and Appurtenances at St. James's Street, Walthamstow, for the Proprietor of Everett's Stores. Mr. J. WILLIAMS DUNFORD, M.S.A., F.I.Inst., Architect, 103C Queen Victoria Street, E.C.			
Holland	£1,879	0	0
Barton	1,840	0	0
Wall	1,587	0	0
Groome	1,497	0	0
Morgan	1,496	0	0
Herle & Farrow	1,487	0	0
E. FULLER, Walthamstow (accepted)	1,455	0	0
Architect's estimate	1,475	0	0

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SMETHWICK.

For Enlargement of Cape Schools, for the School Board.

HARLEY & SON, Smethwick (*accepted*) . . . £3,079 0 0**SUNK ISLAND.**

For Embankments and Reclaiming Land, Sunk Island, and Brick Culvert, for H.M. Office of Woods and Forests. Mr. G. BOHN, Engineer, Imperial Chambers, Hull.

E. Tempest, Manchester	£22,062	0	0
W. Binns, Bradford	17,857	4	3
S. & W. Pattinson, Sleaford	17,750	0	0
Crossley, Tilburn & Co., Edinburgh	15,455	2	7
J. Moffat, New Ferry, Birkenhead	14,619	1	4
A. Kellet, York	13,393	0	0
G. Lawson & Sons, Glasgow	12,331	0	0
J. Harman, Hull	12,056	18	9
J. Pearson, Hull	11,028	6	6
B. Robinson, Hull	11,000	0	0
J. SANGWIN (<i>accepted</i>)	9,677	4	7
J. Dickson, Filey	9,693	0	0
Engineer's estimate.	10,007	4	3

WALSALL.

For Supplying and Erecting at Pleck Gasworks, Walsall, Two Lancashire Boilers, 24 Feet Long and 7 Feet Diameter, for the Corporation.

E. DANKS, Oldbury (*accepted*) . . . £450 0 0**WANSTEAD.**

For Boundary Walls and Fencing, Cobbold Road, Wanstead, for the School Board. Mr. JOHN T. BRESSEY, Surveyor, 70 and 71 Bishopsgate Street Within, E.C.

C. F. Hewlitt, Forest Gate	£475	15	6
Co-operative Builders' Society	473	10	0
A. E. Symes, Stratford	470	10	0
Hearle & Farrow, Cable Street	464	0	0
J. S. Davis, Hackney	457	18	0
J. Catley, Leytonstone	454	0	0
A. Reed & Son, Stratford	447	0	8
T. White & Son, Bow	438	15	11
T. Renton, Stratford	382	19	0
C. H. Binney & Co., Ilford	379	0	0
Surveyor's estimate	382	3	1

WELLINGBOROUGH.

For Building Shop in High Street, for Mr. William Pendered. Mr. EDWARD SHARMAN, Architect, Croyland Abbey, Wellingborough.

W. Goodman	£389	10	0
H. Dorman	379	0	0
W. Stevens	355	0	0
Hacksley Bros.	352	19	0
J. Underwood	342	0	0
G. BROWN & SON (<i>accepted</i>)	338	0	0

WRAGBY.

For Building Wesleyan Chapel, Schoolroom, Classrooms, &c., at Wragby, Lincolnshire. Mr. JOHN WILLS, Architect, Victoria Chambers, Derby.

Walter & Hensman, Horncastle	£1,437	5	0
M. Otter & Co., Lincoln	1,435	0	0
R. Mawr, Louth	1,397	11	10
A. B. Wright, Lincoln	1,387	0	0
S. Sherwin, Boston	1,382	0	0
M. Hatcliffe, Horncastle	1,343	0	0
T. Wilkinson, Cleethorpes	1,320	0	0
J. M. Thompson & Sons, Louth (<i>accepted</i>)	1,247	0	0

WROTHAM.

For Building New Farmhouse, near Wrotham, Kent. Mr. ST. PIERRE HARRIS, Architect, 1 Basinghall Street, E.C., and Orpington.

Somerford & Son, Clapham	£1,095	0	0
Stebbing & Pannett, Sidcup	1,045	0	0
CATLETT, Belvedere (<i>accepted</i>)	1,010	0	0

At the meeting of the Carnarvon Town Council reports by Mr. Baldwin Latham, C.E., on the water supply and sewerage system of the town were considered, and the sanitary committee's recommendation adopted, that the Local Government Board be appealed to for sanction to loan 3,000*l*. Touching Mr. Latham's report on the discharge of sewage into the old harbour, the sanitary committee reported that in their opinion the engineer's report failed to prove that the present system of sewerage was dangerous to the public health, and in this they were supported by the unanimous opinion of medical men of the town and by the reports of their own officers.

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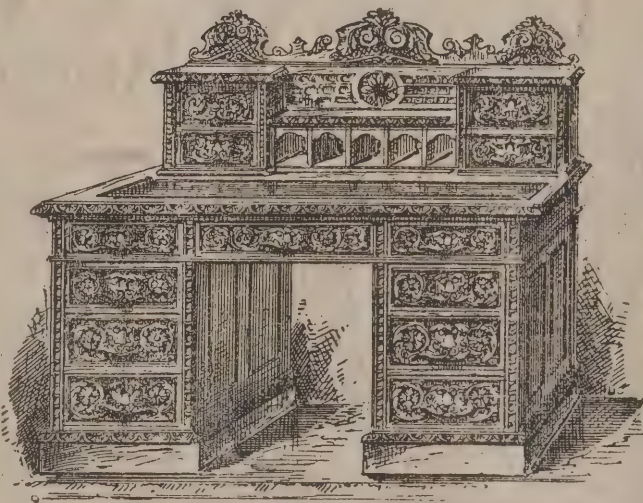
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440.—English Carved Oak Writing Table, Leather Top, on Casters, £15 10s.

Without Drawer and Pigeon-holes on Top, £10 10s.

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THE ROYAL COLLEGE OF MUSIC, SOUTH KENSINGTON.

THE MARKET PLACE, SAFFRON WALDEN.

LANGLEY, PUTNEY HEATH.

RED BRANCH HOUSE, WIMBLEDON.

TRADE NOTES.

WE hear that Mr. John Grundy has purchased the whole of the valuable stock and patents of the Helios and Calorifer stoves from Mr. Heim, of Vienna, and Oxford Street, London, W. The premises, 95 and 97 Oxford Street, will be open until June 24, and architects and builders are invited to pay a visit of inspection, as the stock, which is very valuable and purchased for 4,000*l.*, will be sold at greatly reduced prices. We may be sure that Mr. Heim's patents, which have already been so much appreciated, will become even more successful in Mr. John Grundy's hands and under his management.

THE Higher Grade School for Girls, Chester, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A LARGE clock has just been erected in the parish church, Southmolton, North Devon, at the cost of Mr. A. F. Terrell-Shapland. It shows the time on one 7-inch dial, chimes the Cambridge quarters upon four bells, and strikes the hours. Messrs. John Smith & Sons, Midland Clock Works, Derby, have carried out the work.

WE invite attention to Braby's galvanised iron sanitary manure guards and cages, manufactured by Messrs. Frederick Braby & Co., of Euston Road, which, in accordance with sanitary regulations of the London County Council, have to be used in all stables. It appears that these goods are galvanised after manufacture. They are extra strong, made on strong wrought-iron frames:—Half-round top-rail, 1½ inch by ¾ inch; flat bar at bottom, 1½ inch by ⅜ inch; standards, ½ inch, and covered with corrugated diamond wire lattice, 1½ inch mesh by 10 B.W.G. Others are also made in the same strong manner, and fitted on four cast wheels to suit purposes where something portable is required instead of a fixture.

ELECTRICAL.

AT the quarterly meeting of the Hull Town Council a report was presented by the electric-light committee. The Chairman of the committee stated that they spent 1,631*l.* to produce a return of 2,510*l.*, and after paying all costs of working, there was a balance of 888*l.*, from which 750*l.* went to pay interest, leaving a profit of 138*l.* In the first quarter there were 42 users, in the second 50, in the third 64, and in the fourth 148. They commenced by supplying 3,790 eight candle-power lamps, and ended the financial year with supplying about 9,400. During the 11½ months 74,600 units were used.

THE newly-formed Leeds and County Unionist Club in Park Row, Leeds, has been opened, Messrs. Smith & Tweedale being the architects. The entire building is to be illuminated by electric light, Messrs. Woodhouse & Rawson, of Bradford, having put in the necessary fittings.

AT the meeting of the Iron and Steel Institute, Mr. D. Selby Bigge, in course of a paper on electricity for iron and steel industries, said at present he did not see his way to working blast-furnaces by electricity, but he would seek the aid of blast furnaces in generating electricity, considering that, after a waterfall, a Cleveland furnace was the next best friend to those desirous of generating power economically. There was no difficulty whatever in carrying out the winding, hauling, pumping, drilling, lighting and ventilating of mines electrically.

THE Bury Town Council have approved of plans, &c., for a scheme of electric lighting, and resolved to apply for powers to borrow 25,000*l.* for the purpose.

THE Derby Town Council have decided to hold an electric-light exhibition, commencing on May 14, and Sir Frederick Bramwell has consented to give a lecture in connection with the exhibition in the Guildhall on May 16. The Local Government Board have sanctioned the borrowing of 5,000*l.* for extensions in connection with the electric lighting of the borough.

THE docks and quays committee of the Mersey Docks and Harbour Board recommend the Board to construct a jetty at the south-east side of the Duke Street Bridge, East Float, Birkenhead, and to provide there hydraulic cranes, weighing machines, electric light, &c., at an estimated cost of 7,500*l.*

AT the meeting of the Bath City Council a report was adopted from the municipal buildings committee recommending the acceptance of the tender of Messrs. Wyndham & Waters,

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Chicago Exhibition, 1893.

MAW & CO., LIMITED, have obtained Highest Awards for Tiles, Mosaics, and Architectural Faience

of Croydon, for the electric-light wiring in the new building, at a cost of 245*l*, the lowest of six tenders. It was stated that they could make a contract with any company for the electricity.

At the quarterly meeting the York City Council adopted the minutes of the electric-lighting committee, reducing the tenders for consideration at a special meeting to the following:—The Brush Electrical Engineering Company, Limited; the Electrical Construction Company, Limited; Messrs. C. A. Parsons & Co., and Siemens Brothers & Co., Limited.

VARIETIES.

THE dedication of the east window at St. Andrew's Church, Colworth Road, Leytonstone, will take place on Sunday, by the Bishop of St. Albans. It has been erected to the memory of the late Mr. Mark Bean, by his widow. He was interested in every branch of the building trade in the neighbourhood during the whole of his lifetime. The window, which is three lights, is in the style of the thirteenth century, and has been designed and executed entirely in the studios of Messrs. Young & Marten, stained-glass artists, of Stratford, the two side-lights being scenes from the life of St. Andrew in five subjects, and the centre window in three subjects, the Nativity, Crucifixion, and Ascension of Our Lord.

AMONG the unopposed Bills ordered for report in the House of Lords is the Talycafn Bridge Bill. By this Bill a company is formed with a capital of 25,000*l*, for the construction of a stone and iron bridge over the Conway at Talycafn, and road approaches, to take the place of the existing ferry. An arrangement has been made with the Llandudno Commissioners whereby their water-pipes will be carried over the bridge, to obviate the danger to the pipes laid in the bed of the river.

At the meeting of the Rochdale Town Council the minutes of the paving, sewerage and scavenging committee were approved, in favour of erecting more precipitation-tanks at their sewage works at Roach Mills to deal with the whole of the sewage, and to ask the Local Government Board for borrowing powers to the amount of 15,000*l*. for additional lands and works required for sewage disposal.

THE *Leeds Mercury* says:—With a river to be crossed and deep gullies to be spanned, the inhabitants of Newcastle are subject to several portages, or taxes for the repair of bridges. The Byker Bridge, within the city, belongs to a private com-

pany. It is an old brick structure, about the purchase of which by the Corporation there has been years of squabbling. A House of Lords committee recently stopped procedure by the Corporation for leave to rent a railway foot-bridge over the same valley, to give parties an opportunity of coming to terms, the committee stating the figure of 112,000*l*., which the company offered to sell at a few years ago, when 107,800*l*. was the maximum of the Corporation. The bridge originally did not cost more than 90,000*l*. The shareholders of the bridge have now agreed to sell their property at the price named, and the Council have resolved to purchase it.

THE North British Railway Company are to pay to the Edinburgh School Board a sum of 1,500*l*. as wayleave for tunnelling under the High School in connection with their Waverley Station scheme.

At the meeting of the Cheltenham Town Council memorials were received on the Spa revival movement. No definite scheme for a spa was, however, as yet before the Council, though a most favourable report of the quality of the mineral well waters has been received from Professor Thorpe. It was resolved the borough surveyor should submit his present views with regard to the erection of baths and a spa as suggested by the Medical Spa Society at an early date, with an approximate estimate of the expense.

THE Tynwald Court, Douglas, has approved of plans for the erection of a bridge across Douglas harbour, at a cost not exceeding 16,500*l*.

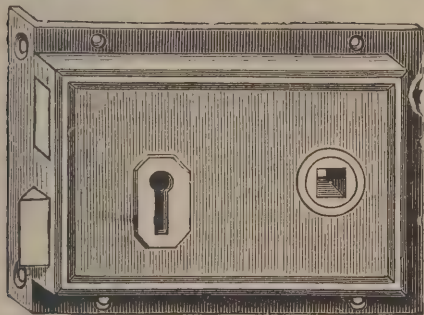
THE York City Council have authorised the estates committee, in view of the freeing of Lendal Bridge from toll in August next, to engage the services of Mr. Max Am Ende, Westminster, engineer and specialist in iron structure, to make an examination of the bridge and report thereon.

At Sutton Coldfield an inquiry has been held inquiring into the application of the Corporation for sanction to borrow 3,500*l*. for works of sewerage and 1,000*l*. for the provision of a depot.

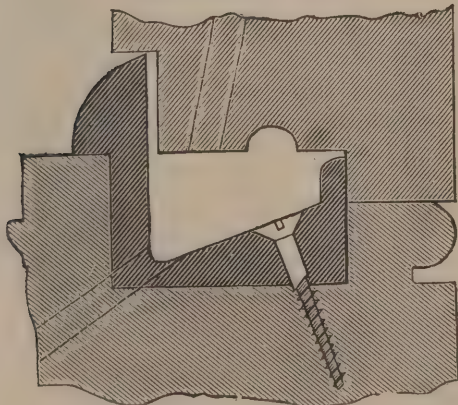
A LOCAL GOVERNMENT BOARD inquiry has been held at Salford with reference to a proposed loan of 14,000*l*. for purposes of sewage disposal (including the provision of a steamship for the removal of sludge to sea) and 10,230*l*. for street improvements.

A TEXTILE hall, which has been built by three of the local trade unions interested in the textile industries, has been opened at Bury.

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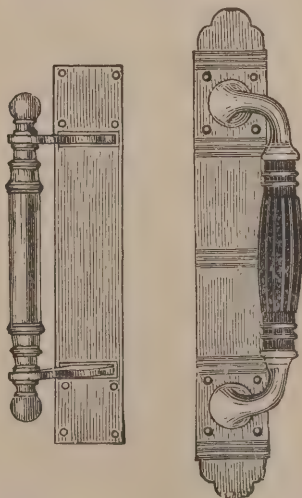


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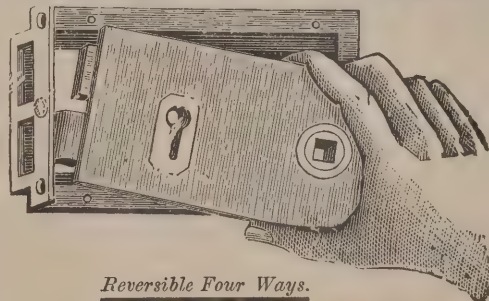


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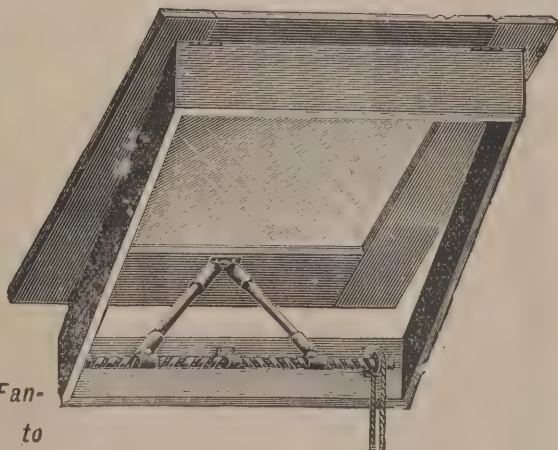
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THE *Birmingham Post* says:—The scheme for converting Birmingham into an inland port like Manchester is being pushed forward with increased vigour now that the Manchester Ship Canal is an accomplished fact. The Severn Commissioners have practically completed the dredging of the river and constructed suitable docks at Worcester, enabling vessels of 400 tons burden to come direct from Bristol to Worcester without breaking bulk, and a number of Midland capitalists, including the spirited Earl of Dudley, have inaugurated a project for converting the Birmingham and Worcester Canal into a ship canal, allowing steam vessels 135 feet in length, 21 feet in beam and 8½ feet in draught to come to the Midland metropolis. The engineering difficulties are somewhat complicated, as they involve the raising of the tunnels in the neighbourhood of Birmingham and replacing the existing locks with an inclined waterway. The estimated cost is 600,000*l*.

THE *Carlisle Journal* says:—Another furnace has been lighted by Messrs. Charles Cammell & Co. at Workington. Out of five furnaces built four are now in blast. About 100 additional men will be employed.

THE Cleethorpes Local Board are about to expend 4,500*l*. upon new drainage works, and an inquiry into the matter has just been held by Mr. Arnold Taylor, Local Government Board inspector.

LONDONERS who cannot escape to the country next week may find some compensation at the Aquarium, where at intervals of about five minutes new performances can be seen. Daily there will be over ninety "turns," and monotony will be avoided.

THE construction by the Bute Dock Company of a new dock and works at Cardiff, which will involve an expenditure of 750,000*l*., has just been sanctioned by a committee of the House of Lords.

THE Local Government Board have given sanction to the Rawdon Local Board to borrow 4,446*l*. for land on which to erect sewage purification works, and 11,000*l*. for the intended sewerage of the township.

AT the meeting of West Sussex County Council at Horsham it was reported that the further plans prepared by Sir Arthur Blomfield relating to the reduced lunatic asylum, having accommodation for 450 patients, with administrative capacity for 600, had been considered by the committee, and were recommended for approval by the Council. As regards the cost of the buildings, it was impossible to say what it would

be until the quantities were taken out and tenders obtained from contractors. So soon, however, as the complete drawings were ready, the surveyors appointed to take out the quantities would at once begin their work. Approximately, the committee put the total cost at 153,797*l*. 6*s*. 2*d*.

PUMPING BY OIL ENGINES.

OIL engines are gradually coming into use for pumping purposes in country mansions and large establishments where steam-power is not provided, and Messrs. Merryweather & Sons have recently constructed a pump of new design, driven by a small oil engine, for a gentleman's house in Canada. This pump is built on the lines of the firm's small steam fire-engines, being entirely of gunmetal, with valves of the London Fire Brigade pattern, and is fixed in an A frame. The oil engine is of the vertical type, and runs at high speed, driving the pump by means of a belt and pulley direct. A friction clutch is fitted to the pump pulley, so that the pump can be stopped and started without stopping the engine. The quantity of water delivered is 2,000 to 3,000 gallons per hour, so that an hour's pumping per day will provide a plentiful supply for most mansions at a far less cost for fuel and attendance than that of a small steam or gas engine. The average cost per brake horse-power for the oil fuel used is about sixpence per ten hours pumping. Such an engine does not require heavy foundations, a few baulks of timber bolted together being amply sufficient, while the cost compares favourably with other systems.

ST. BARTHOLOMEW'S, SMITHFIELD.

A MEETING of the restoration committee of the Norman church of St. Bartholomew-the-Great, West Smithfield, was held on the 3rd inst. to consider the critical condition of the lady chapel buildings and of the fifteenth-century crypt beneath. The effort made last year left the committee with only 800*l*. towards completing the work, which will cost about 3,500*l*. The committee decided that the remains of the fifteenth-century work are so valuable that they must make sure of preserving what they can with the money in hand, and with that object they propose to begin at once on the westward bay of the chapel. The crypt is under the eastern portion,

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and the restoration of this is most urgently called for by the need in the neighbourhood for a mortuary chapel, to which purpose it is proposed to place the crypt when restored. The work of last year in the transept seems to have given universal satisfaction. It has already toned down wonderfully with the new work. The committee have therefore decided to appeal for further funds at once, in hope that sufficient help may be given to warrant their progressing with this work at the same time.

IMPROVEMENT OF THE SEVERN.

THE Gloucester Corporation Bill, which seeks power to obtain an additional water supply, has been considered by the police and sanitary regulation committee of the House of Commons, Mr. Kenrick presiding.

Mr. Martin, engineer to the Severn Commissioners, said the Westgate Bridge was a stone arch with a span of 88 feet, but it had a headway only of 78 feet at low summer level, and that headway was only obtained in the centre of the bridge, which sloped rapidly on either side, so that at the side of the river there was only a headway of 5 feet. In addition to being awkwardly constructed, the bridge was approached by almost the most difficult bend of the river, which was very much narrower there than it was higher up, where it joined the western channel, and where the waters discharged into the Channel. The course of the river was extremely winding at this bridge. In times of flood and tides the headway was considerably decreased, with the effect that the vessels he had described—vessels which stood 14 feet out of the water—were blocked for sixty days per annum. The *Emilie*, of Cardiff, a type of vessel well suited to the trade of the river, had been unable to get under the bridge. There was a strongly expressed desire in Cardiff, Worcester, and, he believed, Birmingham, for the removal of the Westgate Bridge, so as to improve the navigation. The Gloucester Corporation were opposed to the conversion of the bridge into an opening bridge. There would be no appreciable engineering difficulty in carrying the water main under the river instead of across the bridge. He estimated that under the most favourable circumstances the extra cost would be about 750*l.*, and then something would have to be added for contingencies. The work would certainly not cost 2,000*l.* or 3,000*l.*, as estimated by the engineer of the Gloucester Corporation. In cross-examination, the witness

said the cost of tunnelling under the bridge for a 14-inch main would be about 750*l.*, but it would be impossible to give an accurate estimate, as tunnelling under a river was a risky thing. He did not think a tunnel was absolutely necessary, but he thought it was probable. That was the principal way in which the *status quo* would be effected. Re-examined: His father estimated that to make the bridge swing would necessitate the expenditure of 11,000*l.* odd. By the Chairman: The Severn Commissioners had a scheme before them for the improvement of the bridge, but at present they had no funds with which to carry out the work. It was not likely the improvement would be long postponed, as there was considerable feeling, and it was very probable that the funds would be raised and the Commissioners requested to do the work. There was not a great deal of traffic over Westgate Bridge, and therefore not much inconvenience would result if the bridge were made to swing.

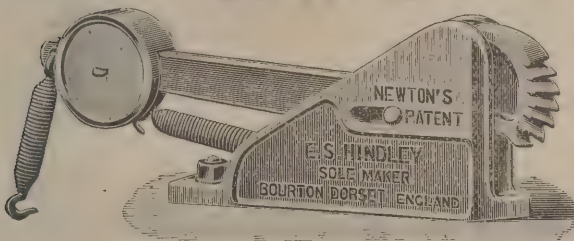
Mr. Leader Williams, chief engineer to the Manchester Ship Canal, said he had a great acquaintance with the Severn. There was now a 10 feet navigation, and the only obstacle to getting larger vessels up the river was the existence of Westgate Bridge. The Severn Navigation had been of great value in keeping down the railway rates from Cardiff to Birmingham and the Midland districts. In cross-examination by Mr. G. B. R. Fitzgerald, and in reply to the Chairman, witness said he had a distinct preference for the tunnel under the bridge. As an engineer, independent of cost and other circumstances, he would rather carry the main under the river than over the bridge. A swing-bridge would accommodate vessels which would require from 20 to 25 feet. He thought the Gloucester Corporation should pay for the improvement of the bridge.

Captain Pomeroy, dock master at the Bute Docks, Cardiff, said the Cardiff Chamber of Commerce had discussed and passed resolutions in favour of the improvement of the navigation of the river Severn. This great waterway was, to everybody's regret, simply destitute of traffic. His company had subscribed 3,000*l.* towards improving the navigation, and he had been sent on a tour of inspection, and what he had seen had simply astounded him. The principal obstacle to the navigation of the river was the Westgate Bridge, which in the interest of navigation should be constructed into a swing-bridge.

Mr. Thomas Thompson, a director of the Barry Dock and Railway Company, said the Bill very seriously interested his company, and he had been deputed to give evidence against it.

The committee, after a few minutes' consultation in private,

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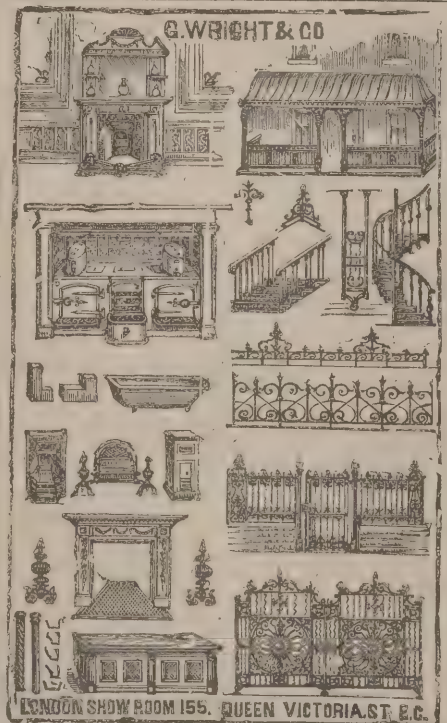
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passed the Bill, but laid it down that the pipes over the West-gate Bridge should be laid down in such a way as not to interfere with the navigation of the river. Any alterations to the bridge should be made at the expense of the Severn Commissioners if they desired to make any alteration.

GRIMSBY DOCK EXTENSIONS.

AMONG the extensions of the Grimsby Fish Docks, to be carried out by the Manchester, Sheffield and Lincolnshire Railway Company, will be the construction of an entirely new approach to these docks, which will open out a large amount of building land. The present route to the fish market will be entirely abolished, and a handsome thoroughfare, 50 feet in width, will lead direct to the fish pontoon and docks from Riby Square, forming practically a continuation of Freeman Street, now the principal street in the town. The new dock works proper include an additional lockpit at the fish docks (there are already two), with piers, and a "gridiron" for repairs; new dock basin, the enlargement of No. 1 fish dock, the enlargement of No. 2 fish dock to over double its present size, the erection of two new coal-drops, the building of stone quays, and the extension of the fish pontoon. It is estimated that the total works will triple both the quay space and fish market accommodation, and will cost nearly a quarter of a million of money.

SHREWSBURY ABBEY CHURCH.

A FURTHER considerable stage towards the complete restoration of the fine old abbey church at Shrewsbury has just been reached by the addition of a new nave roof and clerestory. The work, which has been carried out as the gift of an anonymous donor, has been under the direction of Mr. J. L. Pearson, R.A., from whose plans the new chancel was built in 1887. The nave, originally a fine structure of twelfth-century date, had during a long course of years undergone many transformations. The aisle-roofs had been so far lowered as to leave the bold Norman arches of the triforium exposed externally. These arches had been walled up and windows of poor character inserted, the ancient nave-roof had wholly disappeared, and

consequently these inserted windows were needed for light. The ancient clerestory had now been rebuilt, and a new oak roof of high pitch put on the nave to continue on the high-pitched roofs of the restored choir and transepts.

NULLIFYING AGREEMENTS.

THE case *Gibb & Co. v. Vivian* occupied the attention of the official referee, Mr. Ridley, Q.C., the greater portion of last week. The action was taken to recover a balance of 900*l.* for work done at No. 24 Eaton Square, Belgravia. The plaintiffs, who are builders, of West India Dock Road, E., entered into a contract to make various additions and alterations to the above house for 1,100*l.*, and the action was to recover for extra work beyond that amount. Mr. John A. Gill Knight, architect, who measured and valued the extra work, was called on behalf of the plaintiffs, and Mr. Humphries Davies acted as surveyor for the defendant. The case turned principally upon the validity of the original contract, and in the end the referee entered judgment for the plaintiffs for 1,850*l.* and costs, being 75*o*l. beyond the contract sum, holding that the parties had by their subsequent action rendered the agreement entered into null and void.

BUILDING IN JERUSALEM.

ACCORDING to report of the British Consul at Jerusalem, buildings of various kinds continue to be erected in the vicinity of Jerusalem, and the city is fast outgrowing its former limits. On the western side houses have increased so rapidly within the last few years that quite a large suburb has arisen where formerly fields and vineyards existed. Every available piece of land is now being bought up by private persons or by benevolent societies and missions, and already the name of "Modern Jerusalem" has been given to this new quarter. The latest enterprise suggested is the placing of a steam launch and lighters on the Dead Sea. If this were done, the produce of Moab, which is a country rich in cereals, fruit and cattle, could then be ferried across in a few hours in the lighters in tow of the steam launch, instead of having to be conveyed by caravans round the north or south end of the Dead Sea, entailing a journey of from four to five days.

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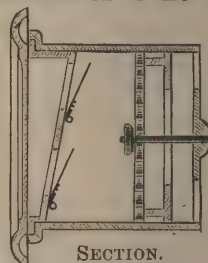
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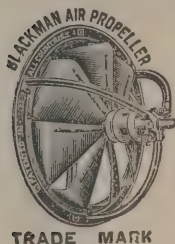
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THE IRWELL AT SALFORD.

A MEETING of the Mersey and Irwell joint committee was held in Manchester on Monday, when it was resolved to prosecute the Salford Corporation for pollution of the river. At the meeting the following statement by Sir Henry Roscoe was read:—

At the last meeting of the joint committee, held on April 2, a report was presented by me on eighteen samples of sewage effluents, two of which came from Salford and were of a very noxious character, and the analytical results placed them at the bottom of the list which you will find in the printed proceedings of the committee. Alderman Walmsley is reported in the daily press as having taken objection to the results and challenged their authenticity, and further stated that he was not at all satisfied with the way in which a good many of the proceedings were carried on. I wish, first, to make a few remarks on the strictures which have been published in the press by Mr. Carter Bell, the analyst to the borough of Salford. In a letter to the newspapers of April 3, 1894, Mr. Bell impugned the accuracy of the above analyses of the Salford effluent, and made statements which will not bear chemical criticism. Mr. Carter Bell, whilst finding fault with my analyses, violates in his own words "the very rudiments of analytical chemistry," for he makes the statement that "every tyro in the science is aware that the application of the acid permanganate test to a water containing salts of iron is utterly fallacious." He knows perfectly well that it is only when the iron is in the ferrous state that this objection applies; he also knows that the salts of iron which were employed for some time previous to the date of his letter, and on the dates when the samples were collected, were not ferrous but ferric salts. These facts are sufficient to condemn the line of argument which Mr. Bell has thought fit to take. As a matter of fact, I did ascertain before applying the oxygen test whether or not ferrous iron was present, and in every case I found none. Mr. Bell further stated that "the amount of oxygen absorbed from an acid solution of potassium permanganate in the case of the clear chalybeate stream which runs through Buxton would be much greater than the amount absorbed under like conditions by the Salford effluent." This statement is incorrect, for, as Mr. Bell knows, the amount of iron in the ferrous state which must be present in the chalybeate water of Buxton in order to give the same results as the Salford effluent would be 33 grains of ferrous oxide per gallon, whereas

a sample of the Buxton stream collected by the deputy-clerk a few days ago was found to absorb less than one-tenth grain of oxygen from an acid solution of potassium permanganate per gallon. In order to show the fallacy of Mr. Bell's arguments I will suppose that the Salford effluent contained 11 grains of ferrous oxide per gallon—a plainly absurd amount. The quantity of oxygen required to peroxidise the iron is 1.2 grain, and this deducted from the Salford effluent figure, viz. 3.02, would still leave the Salford effluent at the bottom of the list. It is interesting to find that whilst Mr. Bell objects to the acid permanganate test for the Salford effluent in this particular case, he has invariably made use of it himself in his printed reports to the Salford Corporation. In a second letter (April 10) Mr. Bell endeavours to substantiate his opinion by a reference to a report on the Barry process experimented upon by the Corporation of Salford in the year 1891. Without discussing the conclusions arrived at in that report, I may point out that I fail to see how a reference to a process tried and condemned in 1891 can affect the examination of the effluent in 1894, when this process was not in use, but a totally different one was employed. But whilst challenging Mr. Bell's criticism as to the value of the permanganate test, I have always made it a point when action had to be taken by the committee to have this test strengthened by other analytical data. No case has ever been brought by me before the courts without a statement of a complete analytical character, and in no case have the results obtained from such further analytical data failed to support the results of the permanganate test. The question for the consideration of the committee is, however, too plain to rest upon chemical subtleties. All the Salford effluents collected in March and April after standing for a comparatively short time are found to be putrescent, noxious and polluting liquids, unfit to be discharged into any river. At the last meeting the opinion was expressed that my more frequent presence at the committee meetings was desirable. I can only say that I have always wished to be present when the committee thought it necessary, and it will be my pleasure in future to attend whenever I am summoned. With regard to Mr. Scudder, I think it only right to say that he has during the last twelve months spent 186 working days in the service of the joint committee, that he has attended 10 legal cases, all of which have been gained. He has visited 77 works, analysed 150 samples and presented 122 reports to the joint committee. It is no more than my duty to express my satisfaction to the committee that we have in



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Mr. Scudder a reliable and energetic chemist. With regard to the position of manufacturers, I cannot refrain from stating that the satisfactory results, as shown by the tables prepared by Mr. Tatton, could not have been arrived at had it not been that the demand of the joint committee had been met in a conciliatory and even generous spirit by the manufacturers, who, as a rule, have at once adopted any suggestions I have been able to make. The work of the next twelve months will not only include the continuation of that which we are engaged upon, but also the careful examination of the results of the processes adopted by the various trades on the stream, and I am glad to be able to report that, so far as we can now judge, considerable improvement has already been effected in trade effluents. I hope in a future report to enter into full details of this matter.

METRIC SYSTEMS.

At the meeting of the Leeds Association of Engineers, Mr. Thornton, president, in the chair, a paper was read by Mr. F. Howard Livens, of Lincoln, on "The British and Metric Systems for Engineers' Work." More calculations, he said, were made in weights and measures in engineering than in any other trade or profession. Engineers were therefore particularly interested in having that system of weighing, measuring and calculating that would give both accurate and rough results with the least labour. Referring to the evolution of standards, he said that the British system was consolidated about 1758. Our system, however, was only convenient within narrow limits. With regard to a further reconstruction of it, the proposed inch, pound and gallon basis did not leave three measures untouched, and would entail as much trouble as the metric system, without its advantages. A careful investigation showed how admirably the metric compromised between conflicting interests. The mètre as a unit might be considered long, as compared with our foot, but the centimètre was most suitable for general engineers' dimensions, whilst there was no comparison between reckoning in millimètres against 16ths and 32nds of an inch. The system afforded the most simple relations between the units of length, weight and capacity; and the identity for practical purposes of the litre and cubic decimètre and of their volume in water with the kilogramme, was of special advantage for engineers' computations. Mr. Livens further showed how the rule could be partially divided so as to combine minuteness with clearness. This system had

already obtained a footing in England, and he quoted a report from Messrs. Willans & Robinson to the effect that the change caused no difficulty, that there were no errors, and that it gave the workman a clear idea of proportion. Mr. Livens gave a number of parallel examples of calculations and estimates worked out on the British and metric systems, showing great saving in labour by the use of the latter. For scientific purposes the metric system, he submitted, was a necessity; business would be expedited by its adoption, and the cost to manufacturers would be recouped.

THE ROYAL DUBLIN SOCIETY THEATRE.

In the House of Commons on the 3rd inst., Mr. William Kenny asked the Secretary to the Treasury what was the cause of the delay in commencing the works for the construction of the new lecture theatre of the Royal Dublin Society in Dublin, to which the Society has subscribed 5,000l.; would he explain why, although plans were approved of in November 1892, tenders were not invited by the Board of Works until December, 1893; if he was aware that tenders were sent in last January, and that no apparent action had been taken with reference to them since that time; and if he would take steps with a view to having the works at once commenced, and the contract with the Society, on the faith of which they subscribed the 5,000l., carried out?

Sir J. Hibbert in reply said the plans approved of in November 1892, were only preliminary or sketch plans without any details agreed upon between the Royal Dublin Society and the Board of Works, and the delay as soon as the revised plans were ready (in April 1893) has been due chiefly to the fact that the estimate of cost largely exceeded the sum authorised by the Treasury, and it was therefore necessary to make arrangements for the purpose of avoiding such excess. It has been within the knowledge of the Society ever since January that the Board of Works have been in communication with the architects and the surveyor with that object. The contract for the theatre is now ready for signature, and is only delayed by a demand by the Society for inclusion in the scheme of two rooms having no connection with the purpose of the theatre. The Board of Works have informed the Society of the impossibility of proceeding with the work on the understanding that these rooms are to be provided, and as soon as the Society assent to their omission the contract will be signed by the Board of Works forthwith.

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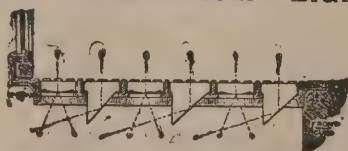
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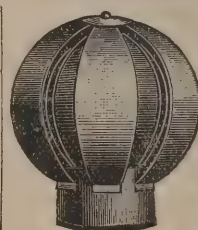
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SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held at the Town
Hall, Westminster, on Monday evening, May 7, 1894, Mr.
George A. Goodwin, president, in the chair, a paper was read
by Mr. R. Nelson Boyd on "A Deep Boring near Freistadt,
Austria, by the Canadian System."

Before entering on a detailed description of the boring opera-
tions under consideration, the author described the early
methods of boring for minerals. He then explained the differ-
ent systems of boring adopted, commencing with the early
improvements introduced in Germany, alluding specially to the
"free-fall" as compared with the "jars" as used to produce
the effect of the cutting tool in the bore-hole.

The author then described more minutely the American
rope system and the Canadian, in which ash poles or rods are
used. The tools were explained, and the construction and
working of the so-called rig fully illustrated. After a somewhat
detailed description of the machinery adopted at the deep
boring, the author proceeded to state that this work was under-
taken for the purpose of proving an unknown portion of the
Ostrau-Karwin coal-fields in Austria, which is a continuation of
the Prussian Silesian coal-field. This part of the coal-field is
covered by a tertiary deposit of clay, which the local geologists
assimilate to the Vienna basin, and which varies in thickness
from a few feet to several hundred yards. The object of the
bore-hole was to penetrate through this deposit of clay and
discover the coal-measures.

A bore-hole had already been put down in the neighbour-
hood to a depth of 710 feet into the clay without passing
through it, and therefore the proposed boring was expected to
be one of considerable depth. The diamond drill was first
selected, but could not be applied owing to an insufficiency of
water, and eventually the Canadian rig was adopted. The
author then proceeded to describe the process of boring, the
difficulties which had to be overcome, and the manner of lining
the bore-hole. In the course of the sinking a spring of water,
charged with bromide and iodide salts, was cut at a depth of
1,010 feet. Inflammable gas was first observed at a depth of

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960 feet, and when the boring was not going on the noise of the bubbling gas in the bore-hole was like the boiling of a gigantic chaldron.

The boring was continued down to a depth of 2,011 feet 6 inches without passing through the clay deposit. It was accomplished in one year five months five days. The actual drilling averaged 10 feet 6 inches in twenty-four hours' work.

In conclusion the author observed that the Canadian system has many advantages. In drilling through highly inclined measures it is preferable to the rope system, and by the use of the jars a much greater rapidity of drilling is attained than with the free-fall method.

THE BETTERMENT PRINCIPLE.

THE principle of "betterment" came before the select committee of the House of Commons in the course of the evidence on the Tower Bridge (Southern Approach) Bill. Mr. Field, surveyor, who gave evidence in support of the Bill, in the course of cross-examination admitted that under the Bill the betterment charge would be placed upon empty houses and vacant land, but he could not see why it should not. The charge would be put upon them, but no rates would be levied upon them. The betterment charge was not, in his opinion, a rate, and it would be payable on vacant land just as the land tax was payable now. Assuming the betterment charge to be a rate, he admitted that to rate empty houses and vacant land was a departure from the basis of rating hitherto adopted—that was to say, profitable occupation. There would be no difficulty in estimating the amount of betterment in the case of empty houses or vacant land. A piece of land, at present fit only for the erection of a couple of cottages, might, if a great thoroughfare were constructed in front of it, become suitable for the erection of a factory. The value of the land would rise automatically. He thought the works might be completed in twelve months.

Mr. Robert Vigers, surveyor, who gave evidence for the opponents, said he had for forty years been employed in compensation cases, having acted as surveyor and valuer and as arbitrator and umpire. In his opinion the betterment clause would be at variance with the general system of taxation in this country, and would prove to be very arbitrary and inequitable. The charge for betterment must have some relation to the value of the property. A surveyor must have regard to the value of the property before and after improvement; better-

ment must increase the rental value. In his opinion it would be very difficult for an arbitrator or valuer to calculate the enhanced value likely to be derived from new streets. It would be very speculative indeed; a new street took some years to develop, and it would be almost impossible for any surveyor to say what was going to be the effect of a new street. The new bridge would take away some of the traffic from London Bridge, and if the property between London Bridge and the Tower Bridge had been subject to a betterment charge that charge would be left, although the traffic had been taken away. Many properties would not be benefited by this improvement; indeed, in the case of small traders, damage would be done, and the small trader would have no claim to compensation because his trade had been destroyed by the improvement. If a man's property was improved he would have to pay increased rates, and to put a betterment charge upon him would be to tax him twice over for the same improvement. Again, the ratepayers of Bermondsey had contributed for years towards improvements in other parts of London, from which they had received no benefit whatever, and it was only fair that the ratepayers of other places in London should contribute towards the improvement of Bermondsey. Besides, the system of rating had the advantage that if the property decreased in value the rates fell too.

Mr. T. W. Hewson, surveyor, said in his opinion the application of the principle of betterment was impracticable. Under the existing rating law property paid fairly for the cost of improvements. The great difficulty under the system of betterment would be to ascertain the proportion of value that accrued from the new street, as distinguished from the proportion that accrued from natural causes in the locality or, in this case, from the bridge itself. If the principle was adopted all dealing with the property affected would be suspended. It often happened that the formation of a new street greatly damaged the properties in the side streets. He looked upon this as an essential metropolitan improvement which ought to be paid for by the whole community. He thought the principle of recoupment was preferable to that of betterment. The main difficulty with regard to recoupment was the expense of buying out existing trades and businesses. The fact that in no case has any substantial sum been recovered under the system of recoupment simply shows that no betterment has taken place. But if no betterment takes place the objection to the system falls to the ground. There will be improvement, but it is impossible for any living man to define



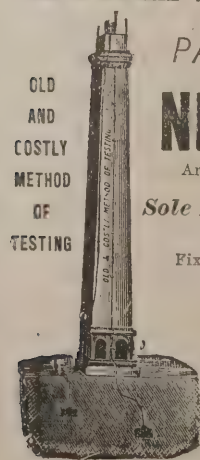
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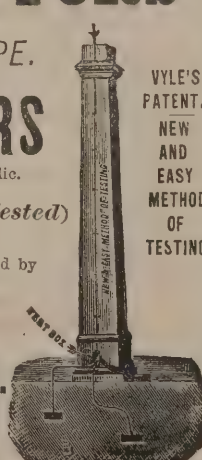
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the amount of betterment produced by the new street. In a great town there is a multiplicity of circumstances contributing to the improvement of a property, and it is impossible to separate one from the rest.

THE LONDON STREETS AND BUILDINGS BILL.

THE important Bill for the consolidation and amendment of the Metropolitan Building Acts, promoted by the London County Council, has been assigned to the consideration of a select committee of the House of Commons, with Mr. Stuart Wortley as chairman.

In addressing the committee for the promoters Mr. Cripps, Q.C., said that the amending part of the Bill was based upon two reasons—either that modern requirements on sanitary grounds were in advance of what was found to be sufficient under the old Acts, or that the bodies that had to carry them out had found certain faults with the principle of those Acts. It was in that respect that the Council asked for amendments. As regarded consolidation, there was no real conflict between promoters and opponents. Passing on to explain the provisions of the Bill which introduced any change in principle, counsel said that the first part had to do with the formation and widening of streets, and, apart from consolidation, there were only three new points which arose upon it. The first point was that the Council desired that notice should be given before streets were laid out or formed. It was most important that the Council should have notice before any works had been begun or expense incurred. Another new point was with reference to the width of streets. At present the minimum width at which a street intended for carriage traffic could be laid out was 40 feet. The proposal in the Bill was that in certain cases the Council might require a width of 60 feet. Another proposal was that with regard to streets not within a distance of two miles from St. Paul's they might require a building to be set back 5 feet from the street in the case of a street to be formed after the passing of the Act. A new street, however, did not necessarily mean a street in a newly laid-out building plot. A street might be altered to such an extent as to become in substance a new street. It was not proposed to pay any compensation in this case. On Part II. of the Bill, which dealt with the question of the lines of building frontage, he was not aware that any question of principle would arise, except perhaps with reference to the concurrent jurisdiction now exercised by the vestry and the

County Council. The question did arise whether, as the Bill stood, the jurisdiction was left in the hands of the Council alone. The Council asked for exclusive jurisdiction. Steps had to be taken in these matters within six months, and if there was concurrent jurisdiction and the local authority took proceedings and subsequently dropped them, the Council would be out of time in all probability. It was proposed that appeals under the Act should go to a tribunal consisting of five instead of three members, as under the Act of 1890, one of whom was to be appointed by the Council. Part III. of the Bill dealt with the naming and numbering of streets, and he did not think any questions would arise upon that. Part IV. was introduced entirely for sanitary and health reasons. In the Act of 1890 there were provisions with regard to unhealthy houses and what were called obstrusive buildings. While they were destroying unhealthy areas in one part of London, such areas might be created in another part. The result of these provisions would be to prevent the creation of unhealthy areas or buildings in the future. In substance they asked, in this part of the Bill, that greater space should be allowed round buildings in future, and that there should be better protection in regard to light and air. These provisions were limited to a certain class of domestic dwellings, having an area of less than 100 square feet, and to dwellings constructed for the accommodation of more than two families. There were also in the Bill provisions dealing with the question of the height of buildings. Under the Act of 1890 the limit was put at 90 feet. This Bill proposed 75 feet as the limit. It was on this part of the Bill that there was most opposition. The question was whether the provisions were too stringent or not. The Council had adopted this part of the Bill as containing what they considered to be the minimum requirements. In another part of the Bill it was proposed that all questions arising under it should be assigned to a particular magistrate, as it was most desirable in order to obtain uniformity. Section 150 set out the constitution of the tribunal of appeal. One member must be appointed by the Secretary of State, one by the Council of the Institute of British Architects, one by the Council of the Institution of Civil Engineers, one by the Surveyors' Institution, and one by the County Council; but no member or officer of the Council was to be appointed. It would thus be seen that all matters under the Bill were to be left to an entirely independent authority—a provision which he thought strengthened the case of the County Council very

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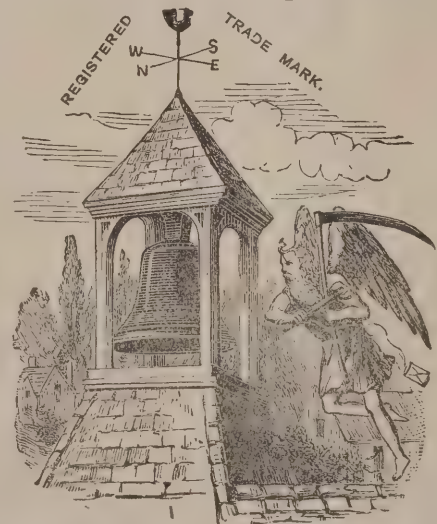
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	GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
	SILVER MEDAL—PARIS, 1889.

much. Counsel referred to the petitions against the bill, and suggested that the same procedure should be adopted as was adopted in the case of the railway rates inquiry and the Thames Conservancy Bill, namely, that before a convenient time, to be named, the opponents should tabulate the amendments they wished to introduce, in order that the County Council might know what they wanted, and in order that the points at issue might be ascertained.

Mr. Littler, Q.C., speaking for associated owners, objected very strongly to this course being taken. The Bill was of such a sweeping character that the amendments he should propose would amount practically to striking out all the new provisions, which were entirely destructive of the interests of his clients.

Counsel for other opponents having expressed themselves to the same effect, the room was cleared for consultation.

The Chairman announced that the committee had decided that it was safer to pursue the ordinary procedure, and discuss the preamble first. In the first instance, it would be convenient to all parties that the evidence should be directed to establishing the preamble, as far as it related to Part I.

THE BLACKWALL TUNNEL.

HITHERTO the work of excavating and constructing the Blackwall tunnel has been carried on without the safeguard of compressed air, the adoption of which has from the outset been arranged for. According to the *Daily News*, the contractors, Messrs. Pearson & Son, of Victoria Street, are, however, of opinion that they have gone as far as it is safe or practicable to go with ordinary pumping in the tunnel itself, and that to attempt to go further would be to incur great risk of a serious settlement. They have, therefore, brought their air lock into use, and have just commenced work under pressure. The men engaged in the operation of tunnelling are practical miners, and the mere excavation is no very serious business to them. It is to be feared, however, that the necessity for this special condition of their labour will tell painfully upon some of them. They have before them about 1,200 feet of tunnel to construct actually under the river, and at the central portion of it they will have above them at high tide somewhere about 80 feet of water and only about 7 feet of a loose and porous river bed. To keep out this head of water there must be an atmospheric pressure of about 35 lbs. to the square inch, over and above the ordinary pressure of the atmosphere. This is

the theoretical necessity, at all events, though it is said that in practice something considerably under what theory seems to require is found sufficient in such work. It is, however, a pressure great enough to cause some men serious distress, and, of course, the undertaking is beset by peril for all engaged in it. It is a satisfaction to know that the County Council has made special provision for the insurance of the lives of the workmen engaged here.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

7971. David Curr, for "An improvement applicable to chimney-tops."

7982. William Robb, Thomas Scott and Livingstone Rae Russell, for "Improvements in and relating to fireplaces."

8040. Alfred Clifford, for "Improvements in ventilators, smoke preventers for chimney-tops, soil-pipes, ventilating shafts for drains for public, domestic or factory buildings."

8058. William George Leatherbarrow and Joseph Bispham Leatherbarrow, for "An improvement applicable to windows."

8090. John McLoughland and William McLoughland, for "Improvements in and relating to swivelling windows."

8156. Charles Hitchcock, for "Improvements in chimney-cowls."

8201. Oskar Paul Zuchner, for "Improvements in draw-off cocks or taps."

8204. Hugh Garratt Forster Barham, for "Smoke-preventing chimney-pot and draught inducer."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

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ABERDARE.—May 31.—Alterations to Police Station. Mr. T. Mansel Franklin, Glamorgan County Offices, Cardiff.

AUDENSHAW.—For Billiard-room to Club. Mr. J. H. Burton, Architect, Ashton-under-Lyne.

BARNSELY.—May 23.—For Building Nine Houses. Messrs. Wade & Turner, Architects, Barnsley.

BELFAST.—May 26.—For Building Offices. Mr. V. Craig, Architect, 5 Lombard Street, Belfast.

BIRMINGHAM.—May 19.—For Additions to Workhouse Laundry. Mr. W. H. Ward, Architect, Paradise Street, Birmingham.

BODMIN.—May 19.—For Building Residence, School Buildings, &c. Mr. William J. Jenkins, Architect, Bodmin.

BRADFORD.—May 21.—For Building Higher Grade Board School. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

BRADFORD.—For Ten Cottages, Three Houses and Shops. Messrs. Young & Co., Architects, 62 Market Street, Bradford.

BRISTOL.—May 28.—For Building Board School. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BROMBOROUGH.—May 29.—For Wood Bridge over the Dibbin. Mr. J. Clark, Surveyor, 9 Castle Street, Liverpool.

BUXTON.—May 30.—For Construction of a Storage Water Reservoir. Mr. Joseph Hague, C.E., Town Hall, Buxton.

CALVERLEY.—May 26.—For Vestries to Parish Church. Messrs. Healey, Architects, 42 Tynel Street, Bradford.

CHESHUNT.—May 19.—For Building Six Villas. Mr. James Bunce, Turner's Hill, Cheshunt.

CHESHUNT.—May 21.—For Alteration of and Addition to Reservoir. Mr. A. Collingwood Lee, St. Mary's Hill, Cheshunt.

COCKERMOUTH.—May 18.—For Additions to All Saints Schools. Mr. R. S. Marsh, Surveyor, Cockermouth.

COLCHESTER.—May 18.—For Building School. Mr. C. E. Butcher, Architect, Queen Street, Colchester.

CROYDON.—May 31.—For Repairs, &c., to Board Schools. Mr. Robert Ridge, Surveyor, Croydon.

DELPH.—May 22.—For Wesleyan Church. Messrs. Wm. Waddington & Sons, Architects, 17 St. Ann's Square, Manchester.

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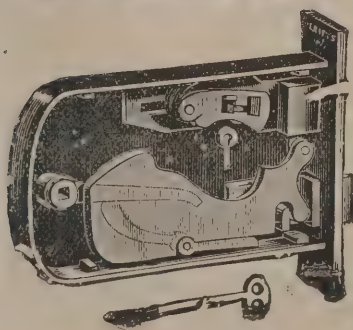
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DODDISCOMBSLEIGH.—May 25.—Restoring Church Tower. Mr. E. H. Harbottle, Architect, City Chambers, Exeter.

DYNAS POWIS.—May 28.—For Building Villa. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

EASTBOURNE.—May 24.—For Building Police Station and Cottages. Mr. W. C. Field, Borough Building Surveyor, Town Hall, Eastbourne.

ELTON.—May 24.—For Extension of All Saints Schools. Mr. D. Hardman, Architect, Silver Street, Bury.

FLEETWOOD.—May 19.—For Building Electric-Lighting Station. Mr. Joseph Tildsley, Town Hall, Fleetwood.

HALIFAX.—May 30.—New Offices and Workshops. Mr. W. H. D. Horsfall, Architect, 9 Harrison Road, Halifax.

HASTINGS.—May 31.—New Cloak-rooms to Board School, Silverhill. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HOLMFIRTH.—May 21.—For Additions to Police Station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

HORNSEY HOSPITAL.—June 4.—For New Isolation Block, &c. Mr. T. de Courcy Meade, Engineer, Southwood Lane, Highgate, N.

HULL.—May 31.—Public Library. Mr. R. Hill Dawe, Town Clerk.

IPSWICH.—May 22.—For Additions to Board School. Mr. T. W. Cotman, Architect, Northgate Street, Ipswich.

LLANGFNL.—May 22.—For Erection of County Buildings. Mr. J. L. Griffiths, Clerk of the Peace, Holyhead.

MAIDENHEAD.—For Building Boys' School. Messrs. Davy & Salter, Architects, Maidenhead.

MUKER-IN-SWALEDALE.—For Vicarage House. Messrs. Chorley & Connon, Architects, 15 Park Row, Leeds.

NEATH.—June 5.—For Technical School. Mr. D. M. Jenkins, Architect, Gwyn Hall, Neath.

NEWHAM-ON-SEVERN.—June 9.—For Additions to National Schools. Mr. W. Spence, Architect, Cinderford.

SOUTHAMPTON.—May 22.—For Building Engine House, &c. Mr. W. Matthews, Waterworks Engineer, Southampton.

SOUTHWARK PARK.—May 22.—For the Erection of Public Conveniences. Mr. H. de la Hooke, Clerk to L.C.C., Spring Gardens, S.W.

ST. ANNE'S.—May 25.—For Offices, Abattoirs and Infectious Hospital. Mr. T. Bradley, Clerk to Local Board, Park Road, St. Anne's-on-Sea.

ST. LEONARDS.—May 31.—For Board School at Bopeep. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

ST. PANCRAS.—May 21.—For Electric-Lighting Station Buildings, &c., Camden Town. Professor H. T. Robinson, Engineer, 13 Victoria Street, S.W.

STOCKTON.—May 21.—For Building Infants' Department to Board School, Mill Lane. Messrs. Weatherill & Whipham, Architects, 59 High Street, Stockton-on-Tees.

SUTTON, SURREY.—May 21.—For External Repairing and Painting Main Building of Brighton Road School. Mr. Church, William Street, Woolwich.

SWANSEA.—May 22.—For Building Board School. Mr. G. E. T. Laurence, Architect, 181 Queen Victoria Street, E.C.

SWINDON.—May 21.—For Building Technical Schools. Mr. T. B. Silcock, Architect, Milsom Street, Bath.

UCKFIELD.—May 19.—For House and Additions to Grammar School. Mr. H. Curtis Card, Lewis.

WANSTEAD.—May 25.—For Repairs to Board Schools. Mr. John T. Bressey, Architect, 70 Bishopsgate Street Within.

WARENFORD.—May 19.—For Alterations to Church. Mr. Mr. George Reavell, jun., Architect, Alnwick.

WEST HARTLEPOOL.—May 29.—For Building Public Abattoirs. Mr. J. W. Brown, Borough Engineer.

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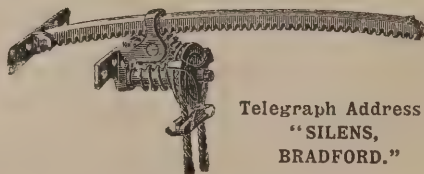
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 Nadin 2,588 19 11
 R. Holmes 2,341 6 7
 Duncan & Jones 2,296 15 0
 Podmore 2,224 15 0
 Pearson 2,060 0 0
 G. Hall 2,000 4 2
 H. Bower 2,000 0 0
 W. Miles 1,787 3 2
 H. BURROWS (*accepted*) 1,700 0 0
 M. Hall 1,666 5 3
 Neale & Birde 1,612 0 0
 Surveyor's estimate 1,785 1 7

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 T. Adams, Wood Green 1,156 8 4
 F. Spencer, Maidstone 1,077 19 4
 J. Mowlem & Co., Westminster (*recommended for acceptance*) 1,011 0 0
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 J. T. Harrison, Distington 325 0 0
 W. Moor, Kirkbride 284 15 0
 W. R. Purdam, Burgh-by-Sands 231 0 0
 N. Harrison, Thursby 198 12 0
 T. LONGCAKE, Silloth (*accepted*) 191 15 6

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For Construction of Sewer, London Street, Brancastle, Norfolk, for the Docking Rural Sanitary Authority. Mr. J. C. WALKER, Surveyor, Hunstanton.
 S. Hipwell, Wisbech £125 0 0
 W. CURTIS, Litcham (*accepted*) 105 0 0
 Surveyor's estimate 97 0 0

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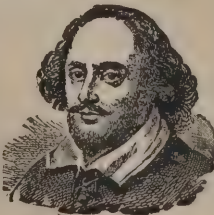
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J. Owens, Wolverhampton	549	9	0
G. Law, Kidderminster	457	0	0
H. Hughes & Son, Gornal	438	16	0
Jeavons & Terrant, Dudley	417	6	4
Surveyor's estimate	425	0	0

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Benstead & Lake, Sittingbourne	£309	9	7
E. W. Iles & Son, Mitcham Common	290	8	2
J. Mowlem & Co., Westminster	278	0	0
H. Lake, Princess Road, Croydon	269	10	9
A. BULLOCK, Croydon (accepted)	266	12	8

Chatfield Road.

Benstead & Lake	451	7	10
E. W. Iles & Co.	420	0	0
J. Mowlem & Co.	408	0	0
H. Lake	390	10	2
A. BULLOCK (accepted)	388	15	10

Crowther Road.

Benstead & Lake	303	12	2
D. Marchn	295	11	8
E. W. Iles & Co.	283	0	0
A. Bullock	282	3	1
H. Lake	278	8	10
J. MOWLEM & CO. (accepted)	272	0	0

Stanger Road.

D. Marchn	590	8	2
E. W. Iles & Co.	566	0	0
A. Bullock	557	1	2
H. Lake	554	19	0
J. MOWLEM & CO. (accepted)	548	0	0
Benstead & Lake	533	10	7

Talbot Road.

Benstead & Lake	222	5	2
E. W. Iles & Co.	221	0	0
J. Mowlem & Co.	196	0	0
A. Bullock	192	3	3
H. LAKE (accepted)	190	14	3

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J. Walker, Castlecomer	10,741	0	0
M. Walsh, Foynes	9,914	18	6
J. B. Healey, Tralee	9,995	4	0
J. Cunningham, Dublin	9,687	0	0
T. J. DIXON, Dublin (accepted)	9,429	5	10

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T. C. Wombwell	476	5	0
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B. W. Garwood, Clacton	700	0	0
E. West, Chelmsford	633	0	0
J. Band, Grays, Essex	576	0	0
Girling & Coe, Ipswich	555	0	0
J. MORAN & SON, Harwich (accepted in part)	540	0	0
H. Plummer, Rattlesden	534	0	0
E. Saunders, Dovercourt	525	0	0
T. Canham, Weeley	422	15	0
Smith, Beaumont & Dawson, Harwich (too late)	391	0	0

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For Alterations and New Stabling at the Pride of the Valley Public-house, for the Farnham United Breweries Company, Limited. Mr. S. STAPLEY, Architect.

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Tompsett & Kingham £166 0 0
A. J. Figg 154 0 0
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For Reconstruction of Harvey Lane Bridge, Golborne, for the Parochial Committee. Mr. CHARLES S. BENNIE, Surveyor.

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P. Ashcroft, Golborne 275 5 0
W. Winnard, Wigan 264 11 0
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For Building Residence on the Glebe Estate, Hunstanton. Messrs. GEORGE FITT & Co., Architects, Queen Street, Norwich. Quantities by Architects.

W. H. Brown, King's Lynn £1,378 0 0
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J. Cook, Slewton	1,214	18	11
R. Mawer, Louth	1,211	15	0
J. Vickers, Nottingham	1,184	4	9
Harrison & Son, Louth	1,100	14	6
Adlard & Miller, Louth	964	18	0
T. MASON, Hebden Bridge (accepted)	852	2	6
W. Hopkinson, Halifax	769	13	0
Engineer's estimate	917	3	6

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CLAYTON, Macclesfield (accepted)	£1,050	0	0

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For Construction of Cattle Shed in Cattle Market, Market Street, Newbury, for the Corporation. Mr. E. A. STRICKLAND, Borough Surveyor.			
E. C. James, Pound Street, Newbury	£79	10	0
T. PLUMB, Myrtle Cottage, Greenham, Newbury (accepted)	69	12	6

NEWCASTLE EMLYN.

For Alterations and Additions to Police Station.			
D. Jones, Newcastle Emllyn	£485	0	0
E. Evans, Llanbyther	444	0	0
THOMAS & LEWIS, Newcastle Emllyn (accepted)	395	0	0
Surveyor's estimate	465	0	0

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W. Williams, Pontypridd	£928	0	0
E. George	785	0	0
JENKINS & SON (accepted)	772	0	0

PENRHUWCEIBER.

For Building Hotel, Stabling, &c., at Penrhiwceiber, Mountain Ash. Mr. S. ROONEY, Architect, Cefn Mably Chambers, Quay Street, Cardiff.			
J. Lewis, Treharris	£3,438	0	0
D. C. Jones & Co., Gloucester	3,249	0	0
D. Davies, Cardiff	3,200	0	0
Newby & Co., Cardiff	3,022	0	0
H. Powell, Pontypridd	2,985	0	0
Hatherly & Carr, Bristol	2,957	0	0
R. Owen, Aberdare	2,940	0	0
W. Lissaman, jun., Chipping Campden	2,853	0	0
Cox & Bords, Cardiff	2,815	0	0
T. REES, Merthyr Vale (accepted)	2,699	0	0
J. Hopkins, Cardiff	2,600	0	0

STEYNING.

For Painting and Distempering Workhouse Infirmary.			
Trussell	£125	0	0
Saunders	68	0	0
Barber R. Oliver	57	0	0
BERRY, Portslade (accepted)	53	10	0
Architect's estimate	75	0	0

WAKEFIELD.

For Erection of the West Riding County Council New Offices, Wakefield.			
ARMITAGE & HODGSON, Camp Road, Leeds (accepted)	£76,824	0	0

WHITCHURCH.

For Building Four Houses, Alkington Road, for Mr. J. D. Jones. Mr. J. HARRY PICKARD, Architect, Whitchurch, Salop.			
G. DODD (accepted)	£1,000	0	0

WIGSTON MAGNA.

For Building Two Villa Residences. Messrs. MILES & BEASLEY, Architects, Leicester.			
W. Starkie	£393	10	0
O. Halford & Sons	390	0	0
A. W. Glover	390	0	0
J. WRIGHT, Wigston (accepted)	387	10	0

WOKING.

For Building Wesleyan Schools, Woking.			
W. J. Butt	£1,252	10	0
H. Ingram	1,084	0	0
J. HARRIS & SON (accepted)	1,015	0	0

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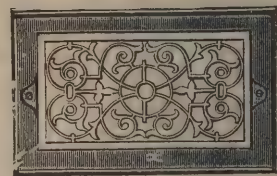
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NATIONAL TELEPHONE No. 6.

Telegrams:—"IRON, WELLINGBORO'."

TRADE NOTES.

MESSRS. PARSONS & HARRIS, of Sidney Grove, Goswell Road, have secured the order for warming the St. Bride's Institute, in Bride Lane, E.C.

THE Stafford School Board have accepted the tender of Messrs. Truswell & Sons, of Newcastle-under-Lyme, amounting to 244*l.*, for heating and ventilating the new Board school.

At the meeting of the Heywood Town Council it was decided to obtain tenders in connection with the new sewage works, which are estimated to cost about 20,000*l.*

TENDERS have been received for the construction of a permanent bridge to connect North and South Brisbane. Thirteen contractors in Brisbane and other parts of Australia have tendered, the highest offer being 130,699*l.* and the lowest 109,932*l.* Two or three ordinary bridges could be built with the 30,000*l.* difference.

THE Albion Clay Co. were adjudged an award for Sykes's patent joint pipes at the Chicago exhibition, in addition to the awards published in the list given in our last issue.

THE Local Government Board have now approved a loan of 4,446*l.* for land and 11,000*l.* for works of sewerage for the district of Rawdon, in Yorkshire. The sewage will be purified by chemical precipitation in tanks, followed by land filtration on 15 acres of land. The scheme has been delayed for some time through the arbitration for the purchase of the land. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham.

WE are asked to state that Messrs. Joseph Kaye & Sons, Limited, supplied the locks, bolts and latches for all the doors, including the lift doors, to the Royal College of Music, and also the gold-jewelled key for Mr. Samson Fox, which he presented to the Prince of Wales on his opening the above building.

WE understand that Mr. E. R. Dolby, C.E., of 8 Princes Street, Westminster, S.W., has been appointed consulting engineer to Messrs. C. H. Glover & Co., Hatcham Saw Mills, for electric-power transmission plant and electric crane; to the London Missionary Society for electric lighting; and to a colliery in Derbyshire for lighting, transmission of power and pumping by electricity.

At the meeting of the Royal Scottish Society of Arts Mr. Mathew Buchan read a paper on "The Practical Application of Electricity to Domestic and other Purposes." They were, he said, about to enter upon a new era in the history of illumination, for electricity would soon be circulating through the streets of Edinburgh. As probable consumers, the inhabitants of the city were more interested in the questions of pressure, Board of Trade units and cost than in that of production. An electricity meter would be supplied by the Corporation. This meter was guaranteed to register according to consumption. Fire was almost impossible if proper attention was paid to the rules and regulations of the Corporation and insurance companies. The Corporation did not undertake to do more than the gas commissioners did now, and the installation of electric wires would in time become part and portion of the plumbers' trade, but his advice was that they should not be trusted with the work in the meantime. Wires, switches, cut-outs and fittings must be installed by a private electric contractor, and the work must be done to stand the test of the Corporation's electrical engineer. Light for light the cost would be about 40 per cent. more than gas, but the saving in other directions by its use would materially reduce the price.

THE Ayr Town Council have instructed Mr. Hammond, electrical engineer, to proceed with measures for the introduction of the electric light, and remitted to the lighting committee to act along with Mr. Hammond. It is estimated that the first cost of the installation will be about 15,000*l.*

ELECTRICAL.

THE first section of the Douglas and Laxey coast electric tramway, extending from Douglas to Glen Groodle, has been opened for traffic. The cars ran the distance of four miles along the new marine drive with remarkable smoothness. Messrs. Mather & Platt, of Manchester, have constructed the line and put in the electric installation.

BUILDING AND BUILDERS.

THE Dean of Guild Court have granted a warrant to the trustees of St. James's Church to erect a new church in Carson Street. Messrs. Hardy & Wight are the architects. Accommodation will be provided for about 1,000, with a hall in addition to hold about 800, the estimated cost being 4,000*l.*



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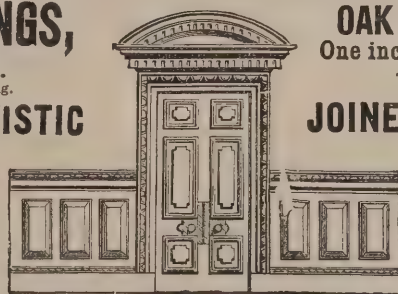
One inch and $\frac{1}{2}$ -inch thick.
Immense Stock always ready for Laying.



Turpin's Patent.

5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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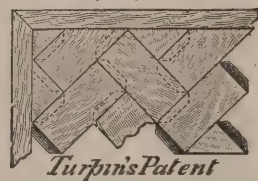


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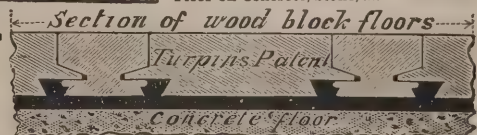
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Section of wood block floors—

Turpin's Patent

Concrete floor

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LONDON.

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MILLWALL.

PUBLIC
BUILDINGS
THEATRES, &c.

It is proposed to build a large hall in Southwark for Wesleyan Methodist purposes, to seat 1,200 persons, at a cost of 22,000*l*.

THE memorial-stones of a Congregational chapel in course of erection at Rhosycae, in Flintshire, have been laid. The estimated cost is 1,200*l*.

THE Renfrewshire County Council propose to build a county hospital at Darnley, for infectious diseases, at an estimated cost of 11,131*l*.

AT the meeting of the Norton-under-Cannock School Board, a report by Mr. G. Barrett, architect, estimated the cost of enlarging Sheffield school, for the additional accommodation of 80 children, at 772*l*. 10*s*., and the building of a new school at Walsall Wood, providing accommodation for 160 children, at 1,358*l*. 14*s*.

THE question of providing additional accommodation (200 beds) for infectious diseases will be considered by the Edinburgh Town Council. The present hospital can be extended at a cost of 120,000*l*., including cost of land and clearing site. Another idea is to provide a new hospital somewhere in the suburbs.

A NEW Oddfellows' Hall is to be built at Nechells, Birmingham, from the plans of Mr. Daniel Arkell, architect, to accommodate between 400 and 500 persons. Mr. W. S. Seamark, of Lister Street, is the builder.

A NEW Catholic church for the Salford diocese is being built at Radcliffe, and another at New Wortley.

THE Alhambra Theatre and the adjoining hotel at Barrow have been purchased by Mr. Robertson, of Jarro, for 7,600*l*.

MR. PEARSON, R.A., has certified the following works to be urgently required to insure the safety of Peterborough Cathedral:—The extensive repair of the masonry of the north and south transepts, underpinning and repairs to the north-east angle of the eastern chapel, and erection of scaffolding in order that a careful examination of the west front may be made.

THE new public baths erected for Shrewsbury at a cost of 7,000*l*. have just been opened by Mr. Alderman Butler Lloyd, who in 1887 proposed their erection in commemoration of the Queen's jubilee. Mr. Lloyd recognised the assistance he had received in the matter from the public, the Corporation and the officials, and expressed his appreciation of the manner in which the work had been carried out by the architect, Mr. W. C. Eddowes, and the contractor, Mr. H. Farmer.

BEAUMONT HOUSE, Firs Road, Kenley, boys' school has been completely destroyed by fire, the damage being estimated at 3,000*l*.

PLANS have been prepared for the extension of the Public Baths in Storie Street, Paisley, by Mr. Moncur, master of works.

THE Board of Guardians, Kingston-on-Thames, are prepared to expend 1,500*l*. on the extension of the Workhouse Infirmary for Women.

THE Plymouth Borough Council propose to spend 2,500*l*. in extending the wholesale meat market and fitting up the Corn Exchange Chamber.

THE new premises of the Writers' Club at Hastings House, Norfolk Street, Strand, will be formally opened to-day (Friday) by Princess Christian, president of the club.

THE new workhouse infirmary at Beverley has just been opened. The building was designed by Messrs. Hawe & Foley, architects, in Queen Anne style, and carried out, including furnishing, for 4,400*l*., or about 75*l*. per bed.

AT the meeting of the Selkirk Town Council the plan of a proposed combined hospital for the county and burgh was submitted and approved. The plan shows a building for eight beds, two duty-rooms and other accommodation, and the probable estimated cost is 890*l*.

THE church erected at Paisley in memory of the late Mr. Thomas Coats, by his widow and family, at a cost of 100,000*l*., has just been completed.

AN extensive scheme of chapel renewal and building has been decided upon in the Wesleyan Norfolk Street (Sheffield) circuit. The scheme embraces the purchase of the freehold of Park Chapel, alterations at Darnell, improvement of Ellesmere Road Chapel, new schools at Don Road, alteration of Carbrook Chapel, and erection of a new chapel at Blackburn. The outlay will be not less than 11,000*l*.

SOME time ago Mr. W. Younger, of Auchencastle, offered to present Lockhouse Tower and twenty-eight acres of land to the town of Moffat for a recreation-ground. Owing to the apathy of the people in accepting the gift, the offer has been withdrawn.

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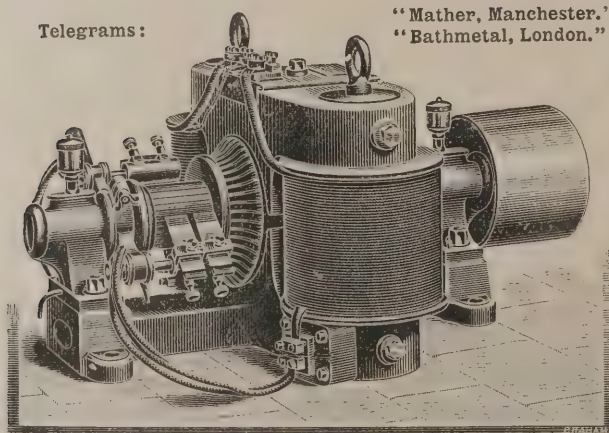
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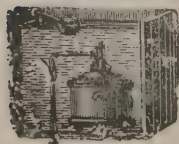
Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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Portable
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Filters.



VARIETIES.

THE annual provincial conference of the Sanitary Inspectors' Association was held at the Nottingham Exchange, about 100 members attending from London, Manchester, Liverpool, Wigan, Newcastle, Stafford and other centres. The proceedings were opened by the Mayor. The president of the Association, Sir Benjamin Ward Richardson, had prepared an inaugural address, which was read by Dr. P. Boobhyer. The municipality was complimented on the great sanitary progress it had made during the last thirty years, which was proved by the gradual reduction in the death-rate of the town.

THE Wednesfield School Board have decided on a site which they intend to purchase for the erection of a school for 300 children.

THE technical instruction committee of the Lancashire County Council are convinced that a county school of horology is urgently needed in Lancashire upon the lines of the excellent horological schools on the Continent. With this object in view the committee has arranged to hold a conference with the leading firms in the watchmaking trade and other authorities interested in the subject at the Sessions House, Islington, Liverpool, on the 28th inst. To this conference all persons engaged in the watchmaking trade or interested in the establishment of a horological school are invited.

AN inquiry has been held into the application by the Birmingham City Council for sanction to borrow 7,175*l.* for the improvement of the river Rea, 4,500*l.* for the improvement of Hockley Brook, 3,990*l.* for the purchase of land as a site for public baths and library at Balsall Heath, and 3,000*l.* for the purchase of land for purposes of the Carr Street improvement. At the same time the Aston Local Board sought power to borrow 4,500*l.* in respect of their share of the work of improving Hockley Brook.

THE Arbroath ironfounding, engineering and boiler-making business, belonging to Messrs. Alexander Shanks & Son, has just been purchased at a reduced upset of 13,000*l.* on behalf of a limited company just formed.

THE Leamington Town Council propose to borrow 4,280*l.* for waterworks and sewage disposal purposes.

AT the meeting of the Manchester Geological Society at Wigan, a discussion took place on the question of the mechanical ventilation of mines, in connection with a paper read at a previous meeting. One point raised was the comparative

economy in the consumption of fuel in fan ventilation as compared with the furnace ventilation of collieries, which was shown to be greatly in favour of mechanical appliances, and, apart from economy, mechanical appliances were in the matter of safety far preferable to furnace ventilation. Mr. C. M. Percy read a short supplementary paper on the subject, and said a very substantial reduction in the consumption of fuel might be effected by the introduction of modern mechanical ventilating appliances, which in the future would comprise comparatively small, quick-running fans and compound condensing engines.

IN the arbitration case of James Waddell & Sons, the firm who constructed the Scarborough and Whitby Railway, versus the North-Eastern Railway Company, Mr. A. M. Dunlop has given his award. The case was heard at Scarborough and in London. The claim, as urged by Mr. Cripps, Q.C., had reference to land at Gallows Close, situate north of Scarborough and Whitby tunnel at Scarborough. The North-Eastern Railway Company obtained compulsory powers to take the land in 1891, an action at law being tried previously. On behalf of the company, the arbitration witnesses assessed the property at from 4,461*l.* to 4,987*l.* Mr. Dunlop has awarded 13,035*l.*

AN inquiry has been held into the application of the Epsom rural sanitary authority to borrow 1,300*l.* for a drainage scheme for Cheam and Cuddington parishes.

THE Ilfracombe Local Board require a loan of 4,600*l.* for works of water supply, street improvements, fire-engine house, &c.

IT is stated in the *Board of Trade Journal* that the improvement reported last month in the building trades has been maintained, the percentage of unemployed in unions connected with these trades having further fallen from 3.5 to 2.8. In the furnishing and woodworking trades an improvement is also noticeable, the percentage of unemployed members of unions having fallen from 4.2 to 3.2.

THE new lock at Richmond will be opened by the Duke of York to-morrow.

DR. EVANS, medical officer of the Local Government Board, has suggested to the Holywell Union more systematic arrangements for the scavenging of Connah's Quay, Bagillt, and Greenfield. The condition of the houses of the working classes he severely condemned as damp, ill-constructed, ill-ventilated and overcrowded. A large number were totally unfit for habitation.

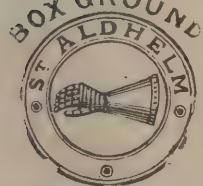
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A HOUSE IN BEDFORD PARK, CHISWICK.

ASHCROFT GARDEN FRONT.

THE WATKIN TOWER.

WEMBLEY PARK was opened to the public on Saturday, Whitsun Eve. Its chief feature, the Watkin Tower, named after its projector, is yet in the first stage of its construction, and many months must elapse before it is completed. The park occupies one of the pretty well-wooded portions of Middlesex. The land has been admirably laid out, without destroying its natural beauties, by Mr. H. E. Milner, and perfect arrangements have been made for sports of all kinds. There is a lake, with a uniform depth of 3 feet, to which the river Brent, which runs through the park, is made to contribute, and the beauty of the scene has been enhanced by the erection of pretty bridges, and by the introduction of a waterfall and other attractions. The lake altogether covers eight acres. Apart from the tower, which its designer intends shall reach a greater altitude than the Eiffel Tower, it is stated that 20,000*l.* has been expended on the buildings in the park, which comprise refreshment pavilions, band-stands, dressing-rooms, conservatories, and a tea pagoda.

THE Lee-on-the-Solent Light Railway, having been inspected and passed by the Board of Trade, has just been opened for traffic. The line is a little over three miles in length, and connects the new Hampshire sea-side watering-place of Lee-on-the-Solent, on the estate of Sir J. C. Robinson, with Brockenhurst station of the London and South-Western Railway. The engineer is Mr. P. W. Neik, the gauge is the usual one, and the permanent way is laid with 60 lbs. steel rails. The contractors were Messrs. Pauling & Elliott. The carriages are of special construction, somewhat resembling miniature Pullman cars.

FLOATING WAREHOUSES FOR MANCHESTER.

THE following report by Mr. Llewelyn J. Dedwydd on warehouse accommodation has been prepared for the Manchester Chamber of Commerce:—

34 Pall Mall, Manchester: May 7, 1894.

Sir,—At your request I have the honour to report that since the opening of the Ship Canal the want of suitable warehouse accommodation on the docks has not only proved a serious drawback and inconvenience to the trade, but it has been made clear that until such facilities are provided no large parcels of grain, cotton and sugar can be dealt with as at other ports, and this is preventing in some important directions the growth of the traffic. There is no land available in Manchester or Salford above Mode Wheel for erecting warehouses abutting on the canal where steamers could discharge direct into store. Mr. J. K. Bythell, chairman of the general meeting of shareholders some few weeks ago, dwelt upon this vital question at some length. It is proposed to form a company to supply store accommodation direct from the importing ship's side.

The object of the company is to build "floating warehouses" for use upon the upper and lower reaches of the waterway (at such points as per agreement with the Canal Company), to accommodate any cargo that will arrive on speculation or to be held by speculative merchants and brokers, which is generally not sold on arrival, and therefore put into store. The "floating warehouses" upon the lower reaches of the canal will serve such large ships and steamers (even Liverpool liners) as cannot pass under the fixed bridges owing to the height of their masts or the cost of dismantling and towage up and down with two tugboats. This will apply to ships with grain from Australia, New Zealand and the West Coast of America, ships with nitrate from the Pacific coast of South America, vessels loaded with flour and fish in cases from San Francisco. Upon the upper reaches the "floating warehouses" can be placed alongside discharging ships without hampering the quay space, their chief utility being their adaptability as moving warehouses more than the carriage of merchandise. The "handling" on the docks and carriage either by cart, rail, or boat, from the importing ship's side, will be entirely obviated. This will apply to cargoes of cotton, sugar, farina, &c. The principal corn merchants of Manchester and district have subscribed to the following statement:—"The consumption of cereals, including wheat, flour, barley, oats and maize, is greater in the district of which Manchester is the

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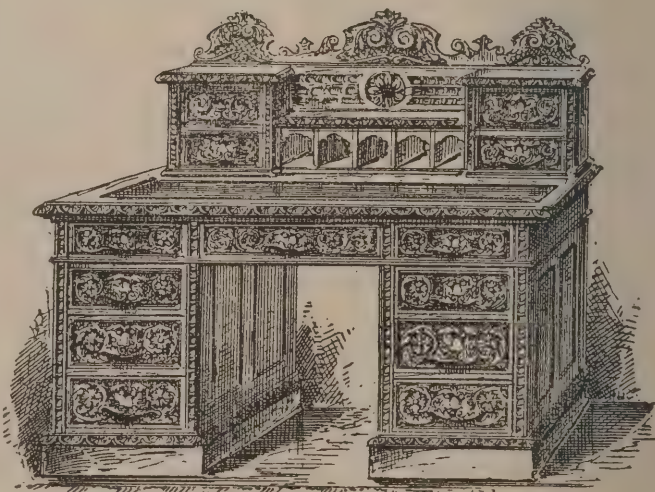
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centre than in any other part of the United Kingdom." The importation per annum to this district is about—Cereals, flour, &c., 1,500,000 tons; nitrate, 35,000 tons; fish in cases, 8,000 tons; cotton, 500,000 tons; sugar, 200,000 tons; farina, 50,000 tons; total, 2,293,000 tons. The bulk of this arrives on "speculation" and requires warehouse accommodation. I have interviewed Liverpool, Hull and London merchants and brokers interested in this trade. They all say, "Give us direct warehouse room and we will work a trade; Manchester is the greatest centre for distribution in England." The writer has had several years' commercial experience on the rivers Elbe and Rhine, where the largest traffic in the world is carried on over "floating warehouses." The trade of Hamburg and the towns upon the Upper Elbe is largely served by large barges or "floating warehouses," and the trade of Rotterdam is similarly served, with the large Rhine cities, viz. Cologne, Coblenz, Frankfort and many other towns. I maintain that facilities in the shape of "floating warehouses" upon the Ship Canal would meet the difficulty in Manchester.

It is obvious that the bulk of the 2,293,000 tons will be carried in sailing vessels (or steamers) that will not sail above Runcorn Bridge. This bulk can be served by the proposed warehouses, and stored free for thirty days, at less than the cost of cartage and handling from ship to a Manchester warehouse, which cost can be entirely saved; and for this saving it can be delivered into railway at any point between Eastham and Manchester, or into inland barges, as ordered by the merchant or consignee. This sum alone will be sufficient to pay a fair rate of interest upon the first cost of the warehouse. I may here mention that the scheme is receiving the united "moral" support of the canal directors, and several important concessions have been granted by the Ship Canal Company with reference to the dues and the general working of the traffic. The cost of transit from canal to warehouses and redelivery into inland barge or railway per month shows in favour of floating warehouses:—

Articles.	Cotton.	Sugar.	Grain.
	s. d.	s. d.	s. d.
Charges in city store . . .	9 5	8 1	7 4
In floating store . . .	5 9	5 1	4 5
Profit for merchant . . .	3 8	3 0	2 11

My object in bringing the matter before your Chamber is to ask it to inquire fully into the merits of the scheme. Should it be found of assistance for the development of trade over the

canal and Manchester district, may I venture to ask for your assistance in placing the scheme before commercial gentlemen who would be likely to co-operate in bringing it into practice? I may say that Mr. Joseph Verdin, of Northwich, and Mr. Morton, managing director of Messrs. Fellows, Morton & Co., Limited, who handle a very large traffic, have consented to become directors, provided two or three well-known local gentlemen will join the Board.—I remain, &c.,

LLEWELYN J. DEDWYDD, a Lloyds Agent.

Mr. Elijah Helm, Secretary Manchester Chamber of Commerce.

LOCKS AND LOCK FURNITURE.

EIGHT of these beautiful samples of locksmith's work have been made for Lord Portman's house, Bryanstone, Dorchester.



They were designed by Mr. R. Norman Shaw, R.A., and made by Mr. James Gibbons, 9 Southampton Row, London, W.C., and Wolverhampton.

SAND IN MORTAR.

It was the opinion of Vitruvius that pit sands were preferable for mortar, but he says that they must be freshly dug, otherwise they are decomposed by the action of the atmosphere and become earthy, and in this state they make bad mortars. Alberti, Palladio, Philibert Delorme, Blondel and some other writers agree in these opinions, but Belidor thinks that river sand is best, and that it should be sharp. Palladio considers that white sands are worst. Belidor states that colour has nothing to do with the matter. Rondelet, in consequence of these contradictory opinions, made experiments himself on the subject, with the following results:—(1) That the glassy or quartzose sands form with lime a weaker mortar than mixed

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sands, and that such mortar is longer drying. (2) That pit sand produces a better mortar than that made with river sand composed of grains of the same size. He did not find that the sharpest (*blus arides*) sands made the best mortar, but thought that of sands of the same kind those which were deepest in colour, excepting the yellow, were to be preferred. The best sands, he states, are such as hold a middle place between those which are very plastic and very sharp. On comparing mortars made with freshly-dug pit sand and the same sand washed and dried in the sun, the sharp (*arides*) grains only being left, he found that the first acquired the greatest hardness, and that mortar made with very fine sand did not harden so well as that made with sand of a moderate-sized grain.

All these authors considered sea sand the worst, but Alberti mentions an exception. The sea sand from the neighbourhood of Salerno he found to be as good as the best pit sand.

Treussart appears to think there is not much difference between river, sea and pit sand, and he believes that the discordant results obtained by preceding writers were occasioned by their having employed sands more or less fine or more or less earthy. If they did not wash their sand, the superiority which they found to belong to either may have been, he thinks, on the one hand due to the greater freedom from earthy matters of the better sand of the two, and on the other to the greater fineness of the particles. His experiments indicated fine sand to be preferable to coarse, but he states that many constructors think coarse sand to be preferable for heavy masonry, and he believes that the prism, made with coarse sand in the experiments from which he draws his conclusions, was cracked without his perceiving it, its resistance having been so feeble. He considers, however, that it is certain that there is an advantage in the case of hydraulic limes in making mortar of fine sand. When he employed pit sands he always washed them, but points out that it is necessary before doing so to ascertain that the sands are not *arènes*. He finally decides that fine sand affords much better results than coarse, both in air mortars and water mortars, notwithstanding the opinion to the contrary of most constructors. His remark concerning the washing of *arènes* suggests the possibility that Rondelet made his experiments on this sort of sand, and thus obtained the otherwise anomalous result of a deterioration in the sand by washing.

Vicat concluded that the advantage of the three different descriptions of sand employed by him varied with the nature of the lime. He calls coarse sand that whose grains, supposing

them round, vary from one-seventeenth to one-eighth of an inch in diameter; fine sand, that where the grains vary from one-twenty-fifth to one-seventeenth of an inch in diameter; powders, such solid substances as have no particles equal to one-hundred-and-twenty-seventh of an inch in diameter. Powders, especially when derived from calcareous substances, he found to make excellent mortar both with hydraulic and eminently hydraulic mortars. He thinks that the greatest difference in the hardness of mortars of the rich limes which the use of this or that sand occasions, rarely amounts to one-fourth of the hardest, but that with hydraulic and eminently hydraulic limes it may exceed one-third.

Raucourt de Charleville considers that sand from the banks of rivers is better adapted for mortar than that which is procured from the middle of their beds; in the latter position the particles are rubbed smooth, but on exposure to the air the surfaces of the grains become pitted and adhere better to the lime. He found that mixed sand that is a mixture of coarse and fine grains was most economical.

Worledge observes that fine sand makes weak mortar, and that the larger the sand the stronger is the mortar. Dr. Higgins prescribes a mixture of fine and coarse sand.

Smeaton remarks:—"That Vitruvius was not only a judicious but a practical observer, as well in regard to mortar as other articles of building, appears from the distinction he makes between sharp river sand and pit sand, which is generally soft, for of river sand he allows but two (of lime) to one of sand. I have long since found the necessity of forming a composition of fine and coarse sand for mortar, unless the sand is naturally so mixed, for as the lime will receive most sand in that way without losing its plasticity, it will of consequence make the hardest and firmest mortar. My practice has uniformly been, if there was plenty of one sort of sand and a scarcity of the other to make the mixture by allowing of the most plentiful sort as far as the proportion of two to one."

Peter Nicholson states that the coarser the sand the stronger is the mortar.

THE Duke of Connaught has sent in to the War Office strong representations upon the insufficiency of the lighting accommodation of the Aldershot Camp, and has recommended, both for sanitary reasons and in the interests of discipline, that the lighting power be increased and that gas be laid on without delay throughout the garrison.

NOTICE.

Mr. JOHN GRUNDY has purchased the whole of the Valuable Stock and Patents of The Helios and Calorifer Stoves from Mr. H. HEIM, of Vienna and Oxford Street, London, W.

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THE SURVEYORS' FORESTRY MUSEUM.

A CATALOGUE has been published of the forestry museum at the Surveyors' Institution, 12 Great George Street, Westminster. The object of the collection is to represent purely British forestry, and it is intended to be of instructional value to those who are interested in the management of British woodlands. Samples are shown of the timbers of our indigenous or naturalised trees, and there is an interesting collection of transverse, radial and tangential sections of woods. The pathological specimens include beech and Spanish chestnut damaged by woodpeckers, Scotch fir infested with *Sirex juvencus*, pine with loose knots caused by allowing dead branches to remain on young or middle-aged trees, and a series of insect injuries to oak, fir, willow and ash. A sample of larch planted in 1861-62 and cut in the spring of 1893 should prove of special economic interest. The trees from among which it was cut were grown on a loose, rocky, mixed soil, forming a railway embankment, in county Louth, Ireland; they were planted on a steep slope, and 4 feet apart every way. The value of the land was about 4d. per statute acre, its natural growth being rough grass, briar and furze. From the droppings and shelter of the larch a skin of fine grass has now formed on the surface, and if the plantation were cut down the land would be five times as valuable for pasture as it would have been had the trees never been planted. Where the plantation was thinned in time some of the trees measure 3 feet in girth outside the bark at about 1 foot above the ground, this corresponding with a diameter of $10\frac{1}{4}$ inches inside the bark. On another embankment, 12 miles north, in a mountain district, similarly formed of earth and *débris* of granite, the trees are rather grosser, measuring up to $12\frac{1}{4}$ inches diameter inside the bark. If two-thirds of these trees were now cut down, at their present value of 1s. 6d. to 2s. each, the remaining third would, in a period of twelve years, be worth 5s. each for railway sleepers, assuming that the butt would make two sleepers and that the lop would pay for cutting and sawing. Experience goes to show that larch sleepers grown on rocky ground are as lasting as creosoted Baltic sleepers, besides being stronger and less liable to split; good red larch has lasted for as long as twenty-two years in a railway. A larch tree planted in 1859 on good land, sheltered, now measures $15\frac{1}{4}$ inches diameter inside the bark. This is the end tree of a row; the others contain as much timber because they are taller, though their diameter is only 11 inches at the butts.

THE BLACKPOOL TOWER.

THIS structure, in connection with which over 200,000l. has already been spent, has been in course of construction for over two and a half years. The surrounding buildings are not yet completed, but the tower itself is in such an advanced state that the directors decided to throw it open on Whit-Monday. As yet one elevator only is working, and this was going up and down with hardly a minute's interval from morning to night. About 500 people an hour were taken to the top, where there is promenading space for over 1,000, and the elevator worked smoothly throughout. The foundations of the Blackpool Tower, which are great blocks of concrete 40 feet square by 12 feet thick, were constructed during the winter of 1891-92. The contractors for the tower, Messrs. Heenan & Froude, of Manchester, got to work in the spring of 1892, and the work of erecting the tower was completed about Christmas last. The tower proper is supported by four legs, each leg consisting of four pillars braced together with lattice girders, while the legs themselves are also braced together with the main girders. The base of the tower forms the circus, and here there is seating accommodation for over 5,000 persons. The first main floor is 55 feet from the ground, and this large area is entirely covered in. Broad flights of steps lead to it from the entrance-hall, while two small lifts are also constantly ascending to this floor. From the staircases also the platform, 85 feet from the ground, can be reached. It is intended to lay this out as a pleasure-garden, and it is expected that it will form a popular lounge and promenade, as there will be accommodation on it for several thousand people at one time. The elevators to the top of the tower start from the 55-foot platform, and the main balcony at which the passengers by the lifts arrive is formed at a level 380 feet above the ground. The area at this height is 44 feet square. The platform to which the cars ascend is entirely covered in. From this 380-foot platform access is gained by two staircases to the open-air platforms above, respectively 400 feet and 420 feet from the ground. A spiral staircase leads to the higher platforms, and finally there is an iron ladder to the "crow's nest," which is over 500 feet from the ground and 550 feet from the sea level. The two lifts to the top of the tower run quite independently of one another. They can accommodate about forty-five passengers each, and while the weight of the car and passengers combined can never exceed ten tons, the seven steel ropes attached to each car have been tested to carry a weight at least ten times as great.



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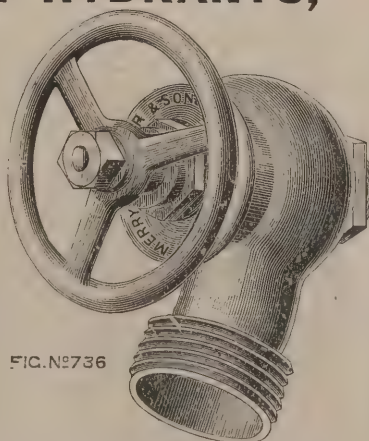


FIG. NO. 736



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GOLD MEDAL, Inventions Exhibition, 1885.

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Then safety brakes are attached which come into action automatically should anything go wrong with the mechanism. Every possible care has been taken to make the elevators perfectly safe. The north wing of the building is not yet completed, and the various surroundings of the tower are as yet unfinished, so that the opening was of an informal character.

CHESTER HABITATIONS.

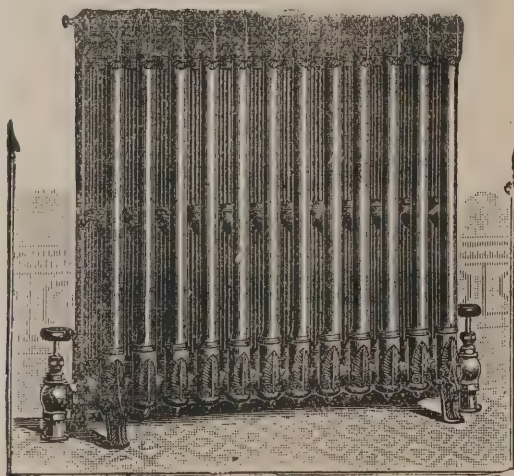
THE Medical Officer of Health for Chester in his annual report on the public health says:—"The health committee have had under serious consideration the question of providing additional house accommodation for the poorest classes. It is computed that 319 houses, occupied by the poorest classes, have been removed as unfit for habitations, or to make room for other buildings during the last twenty years, and quite 385 houses, under 5s. per week rental, have been built during the same period within the city, besides many in the suburbs. A table extracted from the census report of 1891 of special interest in regard to the housing of the working classes shows that there were at the time of the census in Chester 7,481 inhabited houses. The 7,481 houses were some of them sublet, so that the number of separate tenements was 7,717. Of these 3,696 separate tenements, 145 consisted of one room and were occupied on an average by 2.4 persons per room; 648 separate tenements consisted of two rooms each, and were on an average occupied by 1.6 persons per room; 587 tenements consisted of three rooms, and were occupied on an average by under 1.5 persons per room; 2,316 consisted of four rooms, and were occupied on an average by 1.1 persons per room. The total population so housed was 15,489. The remaining 22,016 persons in the city occupied tenements of five rooms or more at the average rate of 1.1 or less per room (5.4 per tenement). The average proportion of persons to houses of all sizes was in Chester—in 1861, 5.21; 1871, 5.238; 1881, 5.125; 1891, 4.96, showing a steady decrease in the proportion of population to houses. In fact, between 1881 and 1891 the increase in the number of houses in the city was almost identical with the increase in the number of the population. 302 houses have been built during that decade, and only 311 additional inhabitants by way of increased population; so also in the suburb of Hoole houses increased more in proportion than inhabitants during the decade, 219 houses being added and 993 population.

EARL'S COURT INDUSTRIAL EXHIBITION.

THIS exhibition was opened by the Lord Mayor. A general exhibition of industrial and commercial inventions are being rapidly put in position, but the main feature of the exhibition will be London's latest popular attraction—the Graydon gigantic wheel and recreation towers. The Watkin tower at Wembley Park will have a formidable rival for popular favour in the Graydon gigantic wheel and recreation towers, which are to be the new attraction at Earl's Court. The wheel, which will be 300 feet high, will have suspended on its periphery forty carriages, hung on steel spindles in such a manner as the floors will always be level. The axle of the wheel will be formed of a tube 50 feet long and 7 feet in diameter, and will therefore be large enough to permit of a couple walking through without stooping. The wheel, when fully loaded, will accommodate 1,600 people, while the towers will hold as many more in the ball-rooms and restaurants. A revolution of the Graydon wheel will exalt the passengers in its forty cars by 300 feet above the groundings, and they will be given (on a fine day) a magnificent view of London and its environs. When one remembers how many steps one has painfully climbed to get a less easy view it can hardly be doubted that we shall all do the circular trip at Earl's Court, rising as if in a balloon in a comfortable carriage without risk and without exertion. A novelty about the Graydon wheel is that one can walk through the axle from tower to tower—that is to say, while the wheel is in motion. This fact in itself will give readers an idea of the immense size of the projected wheel.

EDINBURGH OVERHANGING SIGNBOARDS.

As a good deal of interest is being taken in this question, it may not be amiss, says the *Scotsman*, to explain how it has come to the front at the present time. It appears that a year or two ago a remit was made to the streets and buildings committee, on the motion of Mr. Macnaughton (then one of the councillors), to consider the question of overhanging signboards, &c. Nothing was done at that time, but in the end of last year the question was raised in a practical form by complaint of a huge signboard which the Salvation Army hung out over the door of their premises in Nicolson Street, and which extended right across the pavement. The streets and buildings committee having had their attention called to this "obstruction," put in



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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free, on roller, Ninepence.

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force the powers with which they are armed by the 151st section of the local Police Act. By letter and otherwise the committee were urged to take further action against similar "obstructions" elsewhere, and it was in these circumstances that the old remit was revived, the committee feeling that if the law was to be put in force at all, it must be impartially against all offenders under the section. The printed minutes of the Town Council contain a record of the further procedure. In the minutes of March 16 the following appears:—"Edinburgh: February 27, 1894.—At a meeting of the sub-committee of the streets and buildings committee, under remit on the subject of objectionable signboards, lamps, &c., throughout the city—present, Bailie Dunlop and Councillors Brown and Walker. Read report by the burgh engineer. The sub-committee beg to recommend that the magistrates and Council order the removal of the encroachments, obstructions or projections at the undernoted places, and that within two weeks from the date of the service of the notices." Then follows a list of about 750 shops where such obstructions exist. The minute goes on to say:—"Edinburgh: March 2, 1894.—The streets and buildings committee approve of the following report, and beg to recommend the magistrates and Council accordingly," and on March 16, "the magistrates and Council approved of the foregoing report, and resolved as therein recommended." It is further stated that "during the discussion of a report by the streets and buildings committee on a letter by Mr. George Washington Browne, architect, on behalf of Messrs. Redfern, recommending declinature to allow a sign erected by them at their premises at 31 and 32 Princes Street to remain, attention was called to the fact that there was not a quorum present, and the House was counted out." But at the next meeting of Council (March 20) it is minuted that the magistrates and Council approved of the foregoing report, and resolved as therein recommended.

SEWAGE PURIFICATION IN GLASGOW.

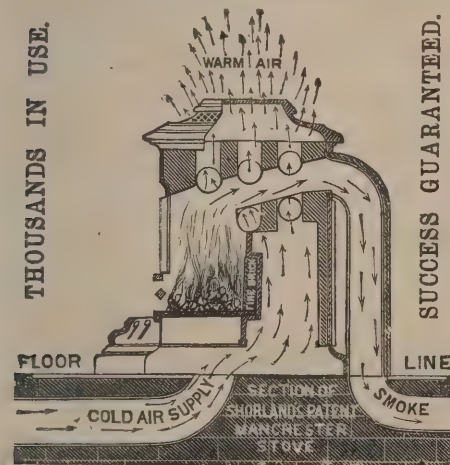
THE works for the purification of sewage in the eastern district of Glasgow were inaugurated on the 2nd inst. They are the first part of the great scheme for the purification of the river Clyde. As they stand the works are capable of dealing with 10,000,000 gallons of sewage per day, or about one-fifth part of that from the entire city, and they can be extended to treat twice that quantity. The buildings and tanks cover an area of

nine acres out of twenty-eight purchased and available. The land cost 38,000*l.*, and the buildings, tanks and machinery an additional 62,000*l.*, or 100,000*l.* in all. This sum is irrespective of the 300,000*l.* spent by the Caledonian Railway Company in constructing new sewers to the works, an expenditure undertaken in connection with the underground railway scheme, which necessitated the removal of many of the old main drains.

The visitors were conducted to the sewage entrance chamber, where samples of the raw sewage were taken. Thence they proceeded to the main building and viewed the pumping, mixing and pressing machinery. As the sewage ran to the main building it passed through rotary screens, which took up floating matters, afterwards passing to two large catch-pits, depositing the heavy matter by its own gravity. These heavy deposits were moved forward by screw conveyers and lifted by elevators to a level sufficient to empty themselves into railway waggons. From the catch-pit the sewage ran into a well situated below the pump-room, to which the visitors were conducted through the engine-room, workshop and boiler-shed. After leaving the pump-room the mixing pit was shown, where the sewage coming from the main pump delivery pipe mixed with the chemicals, sulphate of alumina and lime, to precipitate the impure matters. Samples of the sewage mixed with the chemicals were taken. Afterwards the sewage flowed into the precipitation tanks outside, the sludge deposited flowed back into a large tank under the rooms in which the visitors viewed the sulphate of alumina tanks and lime mixers. From this tank the sludge was pumped into the sludge mixers, where a small quantity of lime was added. It then flowed into four sludge rams. Hence it was forced into presses by compressed air to expel the water, which flowed back to be repurified, the sludge falling into railway waggons below the pressing-room. After seeing the sludge-presses the visitors proceeded to the precipitation-tanks outside the main building, arranged in two rows of twelve tanks in each row, each tank holding 30,000 gallons. In ordinary working each tank will be filled in rotation, and the sewage allowed to come to complete rest for about an hour. The liquor was then drawn off and aerated by being run in thin sheets over the stepped bottoms of twenty-four aeration-beds. Any sludge remaining in the precipitation-tanks goes back by an underground channel to the main building to be again treated. The liquid from the aeration-beds flowed through three iron syphons under Swanson Street to the filters on the west side. The visitors were conducted from the precipitation-tanks to the

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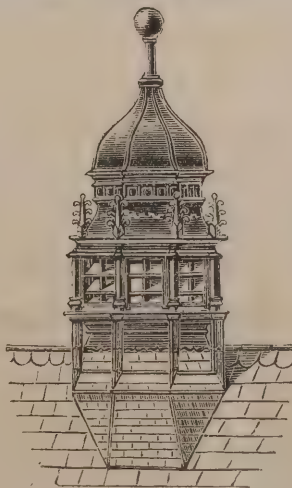


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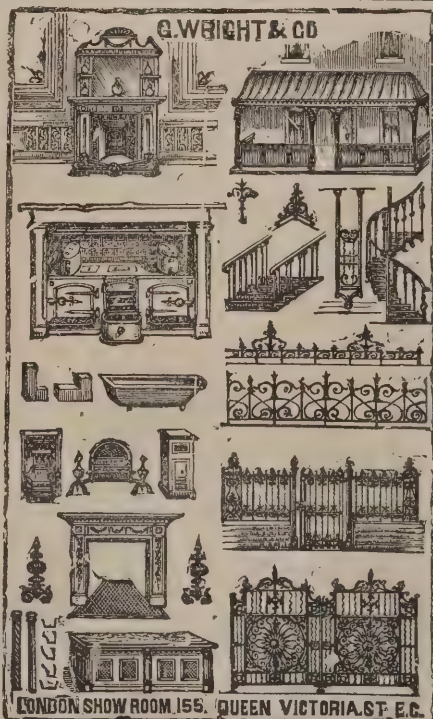
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filters, which consist of sixty tanks, of which twenty were filled with gas-coke and forty with gravel and sand. The sewage, after treatment in the main building, entered the precipitation-tanks, passing over the aeration-beds and then coming to the filters. After passing through these, it was an effluent pure enough to go from the outlet channel into the Clyde.

KEIGHLEY WATER AND SEWAGE WORKS.

LAST week there was a meeting of members of the Incorporated Association of Municipal and County Engineers at Keighley. Mr. W. H. Hopkinson read a paper describing the Keighley water and sewage works. With regard to the water-works, he explained that in 1816 a private company was formed for the purpose of supplying water to the inhabitants from small springs near the town. In 1855, when the company was only able to supply the inhabitants with about six gallons of water per day per head of population, the then Local Board of Health resolved to purchase the undertaking, and paid the sum of 17,000*l*. The Board then commenced looking for fresh water supplies, and in 1869 received sanction to a scheme to construct necessary reservoirs. The scheme comprised the construction of a high-level storage reservoir called Water-sheddles, on the Pennine Range, at the head of the river Worth, in the township of Trawden, Lancashire; a mill-owner's compensation reservoir called Ponden, some two miles lower down the stream; the construction of a low-level storage reservoir called Bully Trees, in the township of Haworth, on the Sladen stream, which is a tributary of the river Worth, with a millowner's compensation reservoir called Lower Laithe, at the foot of the bank of the last-mentioned reservoir, and the making of catch-water conduits, and laying of mains from the storage reservoirs to the service filter reservoir called Black Hill in the town. The Local Board constructed Water-sheddles storage, Ponden compensation, Black Hill service, with necessary conduits and mains. The total storage of water in all the reservoirs for the town's use is about 170,000,000 gallons. Though considered very pure, the water is soft, being about 1½ degrees of hardness. On account of the water containing an acid which acts upon lead service pipes, the Corporation in 1884 laid down at Black Hill reservoir an open conduit, and placed therein a quantity of Derbyshire limestone, through which the water had to pass. The water was hardened, but not sufficiently to stop the action on the lead pipes. About

100 lbs. of fresh fallen lime was then placed daily in the conduit, and this raised the water to 2 degrees of hardness, which had the effect of stopping the action upon the lead pipes. In 1892 the filter of Black Hill showed signs of not passing the water through freely, and the Corporation thereupon decided to push on with the new filter-beds at Oldfield. The works are now being carried out, and Mr. Hopkinson explained his designs for them in detail. Passing on to deal with the sewage farm, the writer of the paper stated that it is situated at Marley, in the Bingley Local Board district, and is laid out on the "intermittent downward filtration" principle. No sewage has yet been brought on to the farm. The area laid out, including beds, banks and roads, is 36 acres, of which 32 acres are in beds. The land is underdrained 6 feet deep, with 9-inch and 6-inch pipes one chain apart. The sewage will not be treated in any way beyond screening. The nature of the ground varies, a large portion being loamy soil 6 feet deep, another portion is gravel, and another portion clay and sandy clay overlying gravel. The farm is laid out to deal with the sewage of 1,000 persons per acre, but if this is found to be insufficient, the Corporation have a large reserve of land for further extensions. The estimated cost of the sewage farm and sewerage scheme is 31,000*l*.

ENGINEERING LABORATORY, CAMBRIDGE.

THE new engineering laboratory, which was formally opened on Monday by Lord Kelvin, mainly owes its existence to the contributions of a number of noblemen, men of science and engineers, who have most liberally responded to an appeal issued in March 1891, signed by the then Vice-Chancellor, Dr. Butler, Master of Trinity College, the Master of Peterhouse, Professors Cayley, Thomson, Ewing and other influential members of the University. It was pointed out that the establishment of a school of engineering at Cambridge was a matter of more than local importance, that it would enable the exceptional facilities which Cambridge offers for the study of mathematical and physical science to be taken advantage of by students of a subject to which such study is peculiarly relevant, it would allow students of engineering to obtain a professional and scientific training of the most appropriate kind without sacrificing the general advantages of University residence, it would probably draw out a few men of mathematical ability into a profession they would otherwise not enter upon,

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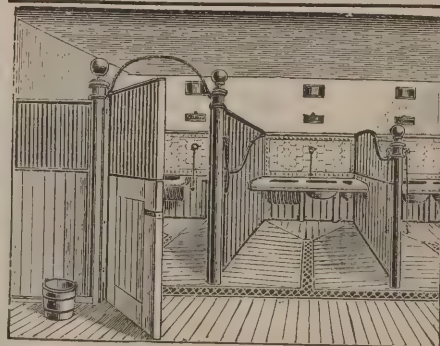


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and it might become a training ground for teachers of applied mechanics whose work in technical schools and classes throughout the country has a wide influence on the industrial population.

An influential committee was formed, consisting of the chief officers of the University, members of the Royal Society, the Institutions of Civil, Mechanical and Electrical Engineers. Upwards of 5,000*l.* was subscribed, including 1,000*l.* from the late Chancellor, the Duke of Devonshire, and, in addition, valuable presents of plant and appliances were given. The University contributed 1,000*l.*, and thus the funds for the new building were obtained. The design of the architect, Mr. Marshall, has not been fully carried out, inasmuch as the erection of the north wing, estimated to cost 2,500*l.*, is postponed for want of funds, and a further sum of 1,000*l.* is required to provide additional apparatus. The new building stands on the site of the old Perse school in Free School Lane; the old hall of the school, with its fine roof, is retained, and forms a mechanical laboratory. The central front block contains on the first floor a room for teaching drawing, with accommodation for about fifty students. Below this room are the electrical laboratories, and above a museum in which the collection of mechanical models formed by the late Professor Willis will be placed. The south wing provides necessary offices, professors and demonstrators' rooms, and a laboratory for advanced work. Behind and partly below the hall of the old Perse school is a steam laboratory with a floor area of about 3,400 square feet. On the roof are tanks for hydraulic experiments. The steam laboratory contains the following engines arranged for experimental work, viz. horizontal steam-engine for driving dynamos, vertical steam-engine with surface condenser, Parsons steam turbine, Worthington steam-pump, Otto-Crossley gas-engine, Hornsby-Ackroyd oil-engine, Rider's hot-air engine and Robinson's hot-air engine. The makers of the engines have supplied them at greatly reduced prices in consideration of the use to which they are to be put. The officials of the Treasury, at the instance of Mr. Preece, C.B., engineer-in-chief of the Post Office, have presented a large dynamo. It may here be stated that a large part of the work of the equipment and erection of the laboratory has been done by the workmen of the University workshops, and the cost has been met by the fees paid by the students.

The Vice-Chancellor, the Provost of King's, presided at the opening ceremony, which took place in the steam laboratory.

He said that the occasion on which they were assembled was a novel one, the opening of a building to be devoted to the teaching of engineering. Some had doubted the wisdom of the University in attempting this new study, but they were looking forward to learn farmers their business, and why not civil engineers? To Professor Ewing's exertions and indefatigable zeal was the erection of the building due.

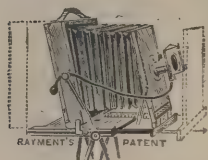
Lord Kelvin, in the course of his address, justified the addition of the teaching of engineering as part of the University curriculum, and maintained that true education consisted in providing the most efficient means for the equipment of persons for the battle of life; and although the old system of scientific education possessed great merit, yet for a profession like engineering it required to be supplemented by a method of teaching such as the laboratory would supply. But it must not be supposed that the present laboratory was to be commended for its completeness; much more would be required both in appliances and buildings, which he trusted would be provided at no distant date. The establishment of an engineering school at Cambridge had already drawn to the University a number of earnest, hardworking students, who but for it would not have joined the University. Their presence could not but benefit the whole University, while the *status* of the profession would be raised by the introduction of men who had the advantages of University culture.

Professor Kennedy, who was introduced as the parent of engineering laboratories, also spoke as to the advantages to be derived from the movement.

Sir Frederick Bramwell, who humorously described himself as one of the mechanicians of the baser sort, said he was an example of the sort of person who had not had the benefit of a University education. He did not think he could ever have passed an examination, for he could never remember anything that would have been required of him by an examiner at the right moment. He had some little fear whether the danger did not exist of the future supply of engineers not exceeding the demand. Their numbers had enormously increased of late years, but he was sorry to say that the demand for their services was decreasing.

The proceedings terminated with a vote of thanks to the Vice-Chancellor, proposed by Professor Jebb, M.P., seconded by Professor Ewing. The latter speaker dwelt upon the necessity of the early completion of the building. The company then separated to view the different rooms of the laboratory, the demonstrators and students explaining the use of the

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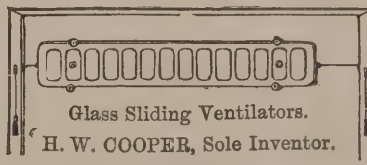
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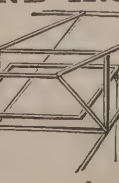
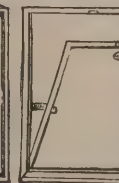
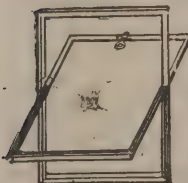
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various appliances. Since the establishment of the Mechanical Sciences Tripos in 1892 the number of students has largely increased; they now number between seventy and eighty, of whom about forty-five are preparing for the new tripos.

THE AUCTIONEERS' INSTITUTE.

THE dinner of the Auctioneers' Institute of the United Kingdom has been held at the Inns of Court Hotel, Lincoln's Inn Fields. The president, Mr. George Brinsley, took the chair. Among those present were Mr. W. H. Willans (president of the London Chamber of Commerce), Mr. A. C. Morton, M.P., Mr. J. Catling, Mr. Thomas Catling, Mr. C. Appleton, Mr. Allen Drew, Mr. John Woodhouse, Mr. W. R. Peck, Mr. John Hepper, Mr. E. W. Richardson, the mayor of Chatham (Mr. C. T. Smith), Mr. T. A. Taylor, Mr. W. Booth, Mr. E. Dobson, Mr. B. M. Bradbeer, Mr. S. Heywood, Mr. E. J. Vaughan, Mr. H. Bushell, Mr. W. G. Howgrave (secretary of the Institute of Chartered Accountants), Mr. W. J. Stansfield, Mr. J. Windham, Mr. J. Saville, Mr. W. H. Elwell (surveyor of the Great Northern Railway), Mr. C. Clarke and the secretary, Mr. Charles Harris. The toast of the evening was proposed by Mr. Richardson, who remarked that the Institute, having overcome the difficulties it encountered at the outset of its existence, was now in a most satisfactory position, and had become a power in Great Britain as the recognised authority of their profession. The Chairman, in reply, said that he had been one of the first to join the Institute, feeling how necessary it was to the interests they had to promote. He did not see why auctioneers should not have the same protection as other professions in this country. It was imperative that those who joined the profession should be qualified to pursue it, and the longer the Institute lasted the better it would be for the public at large. Mr. J. Catling proposed "The Houses of Parliament," and after adverting to the Budget, contended that only licensed valuers should be allowed to value for probate. Mr. A. C. Morton, with whose name the toast was coupled, said that he never thought it a part of his duty as a Radical to abuse the members of the House of Lords as citizens. In this respect, no doubt, they were very much the same as other people. With regard to the House of Commons, it had been seen at its worst during the last few days. He generally agreed with Mr. Catling's contention, and would support it in Parliament if he had the oppor-

tunity. The other toasts were "The Legal Profession," "Kindred Institutions and Associations," "The Vice-Presidents and Council," "Our Guests and Visitors" and "The Press."

ENGINEERING IN EDINBURGH.

At the last meeting of the Edinburgh Water Trust a report was read from the works committee recommending that Mr. James Wilson, of the firm of J. & A. Leslie & Reid, be appointed engineer to the Trust at a salary of 400*l.* per annum, with a commission of 2½ per cent. on the cost of new works, the engineer to have the assistance of the superintendent of works in carrying out the duties imposed upon him.

Mr. Archibald said the committee had gone into the whole question very carefully, and they found that the arrangement hitherto had worked very successfully and economically. In addition to the salary of 400*l.* paid to the late engineers, they had received on an average for the last twelve years a sum of 152*l.* 5*s.* 8*d.* For that remuneration they had to keep an office and an efficient staff of engineers, and he did not think they would get a resident engineer who would devote all his time to the Trust for less than 1,000*l.* or 1,200*l.* Another matter which weighed with the committee was that the surveys for new works which might be gone on with were in the hands of the firm to which Mr. Wilson belonged, and they thought it would not be advisable at the present time to make any radical change in their position. If they were to have a resident engineer the position of Mr. Coyne would have to be reconsidered, for it was very doubtful if the Trust would pay 1,000*l.* for a resident engineer and 500*l.* for a superintendent of works. They did not propose to make any difference in the position of Mr. Coyne, whose duties were to continue as at present.

Mr. Macpherson moved the disapproval of the report in order to obtain fuller information on the subject. It was open to question, he said, whether the engineer of a Trust like that should be a member of a private firm. He could say nothing against Mr. Wilson, but with the prospect of having an expenditure on new works of probably a million of money, the Trust should satisfy themselves that they were getting the very best available man.

The Lord Provost said the late Mr. Reid had told him shortly before his death that he had selected Mr. Wilson for his partner because he considered him the best available man in Scotland.

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AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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Mr. M'Crae thought they were proceeding too hastily in this matter, and he favoured delay in order that they might have a further opportunity of considering the proposed terms and conditions of the appointment.

Mr. Cranston said he thought it could be proved that it would be as economical to give a large salary for a resident engineer as to carry out the proposed arrangement. If all the duties specified were to be carried out by the engineer, he held that the salary was quite inadequate; but his view was that when they considered salary, commission and fee for arbitrations, they would find that the Trust could afford to give from 1,500*l.* to 1,600*l.* for a first-class engineer to carry out all their works and surveys, and he had no doubt such a man could be got for a salary of 1,200*l.*

Mr. Cameron pressed upon the Trust the desirableness of having it clearly laid down, whoever was appointed engineer, that all papers and plans in connection with their works were the property of the Trust.

Mr. Colston, in the circumstances, advised the convener of the works committee to consent to delay for a fortnight, for he felt sure that the more members looked at the terms of the report, the more they would see that it was the best possible arrangement that could be made in the interests of the city.

It was agreed that the consideration of the report be delayed for a fortnight.

THE DRAINAGE OF CHICHESTER.

THE contractor for the drainage works at Chichester, Mr. Peters, has sent the following letter to the Town Council:—

"I trust you will excuse me troubling you, but I should like to point out to you and to the Council the great difficulties and expense I have met with owing to the great quantities of water encountered, far in excess of what was anticipated, I should think, by anyone. I would like to point out to you that the pumping and timbering left in the trenches in South-pallant has cost me about 60*l.*, and the timbering left in trenches in Orchard Street and other places, exclusive of above, has cost me 50*l.* The amount of water met with in the South-pallant would not in all probability have occurred had we not had to have gone the extra depth shown on plans. I am in the hands of the Council as to their decision of meeting me in this matter, and trust they will meet me as generously in this as in other matters where unforeseen difficulties have arisen."

The letter has been forwarded to the engineer for report. On the subject of another difficulty which has arisen the following report has been prepared by Mr. Baldwin Latham:—
Westminster Chambers, 13 Victoria Street,
Westminster: April 27, 1894.

Dear Sir,—In reply to your letter of the 14th inst. I have to report, for the information of the drainage committee and the Corporation of Chichester, that I have taken an opportunity of making careful inquiry into the matter referring to the sewer in New Park Road, and I regret to find that the complaint made by Mr. Butler with reference to the matter appears to have been perfectly justified, and as a consequence must have caused the sub-drainage committee considerable annoyance, which I very much regret, as I know how anxious your drainage committee are to see that the whole of the works are properly carried out. I may say that it is a very difficult matter to get works of this class carried out, even where the contractor and everybody else concerned is anxious that the work should be thoroughly done, as, unfortunately, many of the workmen are not fully alive to the importance of the avocation which they follow in jointing pipes, and "out of sight, out of mind" may be said of many of these persons. Of course the contractor is primarily responsible for all defective work, but it is his duty to employ such persons who will carry out the contract in the mode specified, and in this case it is required that the joints are to be made perfectly watertight. It appears that on the report of Mr. Balchin, one of the inspectors, the resident engineer caused the trenches to be filled in upon the application of the contractor, and as the water was rising rapidly at the time, the pipes were filled in before being tested. The test, when applied to these pipes, would have immediately discovered that they were defective in their jointing, and this would have involved the contractor in very considerable extra expense in having to make them watertight at a subsequent period, because not only does the contract require the contractor to use the water test as the pipes are laid, but when the works are completed the leakage is not to exceed in any length of sewer the amount stipulated in the contract when applied to any length. I consider it, however, a most grave dereliction of duty on the part of Balchin, who was the inspector responsible for the examination of these joints, that he did not examine them, but took the ganger's assurance that they had been properly laid. Therefore it appears to me that anyone who allows a long length of pipe, as in the present case, to be passed out of his hands

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without examination is quite unfit to take charge of such important works, where so much depends upon the work being properly performed, especially in face of the fact that it does not appear that his word can be relied upon, as he has reported totally different to Mr. Prior to what he has reported to the committee and to myself. Under the circumstances I have advised Balchin to send in his resignation forthwith.—Faithfully yours,
BALDWIN LATHAM.

Mr. Edward Arnold, Town Clerk, Chichester.

The report is to be considered at to-day's meeting of the Council.

VANCOUVER.

A CORRESPONDENT of the *Times*, in an article on the prospects of British Columbia, says that Vancouver, the terminus of the Canadian Pacific Railway, and one of the termini of the Northern Pacific, furnishes an illustration of the magical change that can in modern times be quickly wrought by the application of capital and its ready handmaids, science and labour. Six years ago its site was entirely occupied by a dense forest of the magnificent pines and cedars of the Pacific coast; now it has nearly 20,000 inhabitants, enjoying all the comforts and most of the luxuries of civilisation. The signs of rapid growth are already disappearing; dynamite has blown out the stumps; fire has burnt up the wood; massive blocks of buildings are seen on all sides; the telephone is everywhere; electricity lights the streets, the hotels, even the private houses; it works the excellent tram system which connects Vancouver with the beautiful and flourishing town of New Westminster, ten miles away. The people, coming chiefly from eastern Canada and England, have retained their eastern and English habits. On Sunday the place has an aspect of quiet respectability like that of an English cathedral town. In spite of its rapid growth it has never known anything of the roughness of new towns across the border. The site of the city is admirable. A moderate elevation gives it an air of dignity; the eye looks down upon the broad and placid waters of the harbour, beyond which are noble ranges of mist-covered hills. Close at hand is Stanley Park, a splendid reservation of primeval forest, covering many hundred acres. Already intersected by pleasant walks and surrounded by a carriage-drive which winds along the cliffs and bays of the peninsula, giving wonderful panoramic glimpses of land and sea, the whole forms

a recreation-ground for this community, born but yesterday, that the proudest and most ancient capitals of Europe might envy. Vancouver is the meeting-place of the Empire's extreme west and east and south, for of the two main lines of steamships which frequent the port, one has its further terminus at Hong Kong, the other at Sydney. Their presence vindicates the policy which led Canada to make such sacrifices to secure a base upon the Pacific.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 8540. Richard Silverwood, for "Improvements in sliding sashes or windows."
- 8577. James Duckett, Son & James Duckett, for "Improvements in and relating to flushing apparatus for water-closets."
- 8693. George Harris Haywood, for "Improvements in ventilators."
- 8729. Arthur Lewin, for "Improved device for preventing the closing of the sashes of French windows."
- 8735. William Henry Palmer and William Gibson, for "An improved cowl or ventilator."
- 8749. Zotique Leroux, for "Improvements in windows."
- 8776. Robert Bolton, for "Improvements in the construction of chimney-pots."
- 8831. Henry Charles Foskett, for "Improvements in and connected with window fasteners."
- 8853. William Nichol, for "Improvements in and relating to window-sash and button-rod fastener."
- 8910. Julien Bouhon, for "Improvements in the construction of ventilators."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

BIRMINGHAM.—May 28.—The Guardians of the King's Norton Union are desirous of receiving Competitive Plans for the Erection of a plain and substantial Infirmary upon Land adjacent to the Union Workhouse, Selly Oak. Mr. Edwin Docker, Clerk, Birmingham.

LLANDUDNO.—May 31.—Designs are invited for Municipal Buildings. Mr. E. P. Stephenson, A.M.I.C.E., Llandudno.

CONTRACTS OPEN.

ABERAVON.—May 28.—For Building Infant School for 180. Messrs. Thomas & James, Architects, Plough Terrace, Port Talbot.

ABERDARE.—May 31.—Alterations to Police Station. Mr. T. Mansel Franklin, Glamorgan County Offices, Cardiff.

BALLINDERRY.—May 28.—For Re-roofing, &c., Parish Church. Mr. Banks, 10 Chichester Street, Belfast.

BANCHORY.—June 4.—For Building Railway Station-house. Mr. W. Moffatt, Secretary, Aberdeen.

BARNESLEY.—June 2.—For Building Drill Hall. Mr. Herbert Crawshaw, Architect, Regent Street, Barnsley.

BELFAST.—May 26.—For Building Offices. Mr. V. Craig, Architect, 5 Lombard Street, Belfast.

BELFAST.—May 28.—For Building Central Electric Station. The Resident Electrical Engineer, Town Hall, Belfast.

BELFAST.—June 1.—For Building Two Houses. Mr. C. V. Chevers, 15 Donegall Place, Belfast.

BEWCASTLE.—May 31.—For Building Master's House. Mr. Armstrong, Graham's Onset, Bewcastle, Carlisle.

BRISTOL.—May 28.—For Building Board School. Mr. E. W. Barnes, Architect, Guildhall Chambers, Broad Street, Bristol.

BROMBOROUGH.—May 29.—For Wood Bridge over the Dibbin. Mr. J. Clark, Surveyor, 9 Castle Street, Liverpool.

BUXTON.—May 30.—For Construction of a Storage Water Reservoir. Mr. Joseph Hague, C.E., Town Hall, Buxton.

CAERPHILLY.—May 30.—For Building Shop. Mr. J. H. Phillips, Architect, St. John's Chambers, Cardiff.

CALVERLEY.—May 26.—For Vestries to Parish Church. Messrs. Healey, Architects, 42 Tyrrel Street, Bradford.

CAMBLESFORTH.—May 28.—For Works in Building Wesleyan Chapel, Warming Apparatus, &c. Mr. Henry Brookes, The Hall, Camblesforth, Selby.

CELBRIDGE.—June 1.—For Alterations to Workhouse. The Master of the Workhouse.

CHORLEY.—For Rebuilding Hotel. Messrs. Heaton & Ralph, Architects, Wigan.

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CROYDON.—May 31.—For Repairs, &c., to Board Schools. Mr. Robert Ridge, Surveyor, Croydon.

DEWSBURY.—May 31.—For Building Laundry and Engine House, and Alterations at Workhouse. Messrs. Holtom & Fox, Architects, Dewsbury.

DODDISCOMBSLEIGH.—May 25.—Restoring Church Tower. Mr. E. H. Harbottle, Architect, City Chambers, Exeter.

DOWNHAM MARKET.—June 1.—For Building Wesleyan Schools. Rev. James Green, Bexwell Road.

DRIFHLINGTON.—May 29.—For Building House. Mr. F. W. Ridgway, Architect, Borough Chambers, Dewsbury.

DURHAM.—May 29.—For Additions to General Gordon Inn, Claypath. Mr. George Ord, Architect, 16 The Avenue, Durham.

DYNAS POWIS.—May 28.—For Building Villa. Mr. W. H. Dashwood Cople, Architect, 1 St. John's Square, Cardiff.

EXMINSTER.—June 12.—For Extension of the Devon County Asylum. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

GATESHEAD.—June 1.—For Building Mission Room. Messrs. Oliver & Leeson, Architects, Mosley Street, Newcastle-on-Tyne.

HALIFAX.—May 30.—New Offices and Workshops. Mr. W. H. D. Horsfall, Architect, 9 Harrison Road, Halifax.

HANDSWORTH.—May 30.—For Taking Down and Rebuilding Bridge. Mr. E. Kenworthy, Surveyor, Public Offices, Handsworth, Staffs.

HANLEY.—May 28.—For Building Shop Premises. Messrs. R. Scrivener & Sons, Architects, Howard Place, Hanley.

HASTINGS.—May 31.—New Cloak-rooms to Board School, Silverhill. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HORNSEY HOSPITAL.—June 4.—For New Isolation Block, &c. Mr. T. de Courcy Meade, Engineer, Southwood Lane, Highgate, N.

HULL.—May 31.—Public Library. Mr. R. Hill Dawe, Town Clerk.

IRCHESTER.—May 30.—For Building Dwelling-House. Mr. J. E. Cutlar, Architect, Market Square, Wellingborough.

KNOCK.—For Building Villa. Mr. Thomas Pentland, Architect, 81 High Street, Belfast.

LLANELLY.—May 30.—For Extension of Hospital. Mr. E. M. B. Vaughan, Architect, Borough Chambers, Cardiff.

NEATH.—June 5.—For Technical School. Mr. D. M. Jenkins, Architect, Gwyn Hall, Neath.

NEWHAM-ON-SEVERN.—June 9.—For Additions to National Schools. Mr. W. Spence, Architect, Cinderford.

PLAISTOW.—May 28.—For Building Board School. Messrs. J. T. Newman & Jacques, Architects, 2 Fen Court, E.C.

PUCKLECHURCH.—May 31.—For Infant School. Mr. W. L. Bernard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

ST. ANNE'S.—May 25.—For Offices, Abattoirs and Infectious Hospital. Mr. T. Bradley, Clerk to Local Board, Park Road, St. Anne's-on-Sea.

ST. HELEN'S.—June 13.—For Building Free Library and Technical School. Messrs. Briggs & Wolstenholme, Architects, 1 Richmond Terrace, Blackburn.

ST. LEONARDS.—May 31.—For Board School at Bopeep. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

ST. PANCRAS VESTRY.—June 4.—For Buildings for Destructor Cells, Offices, &c. Mr. W. N. Blair, Engineer, Vestry Hall.

SOUTHAMPTON.—May 29.—For Building Engine-house and other Works. Mr. W. Matthews, Waterworks Engineer, Southampton.

SOUTHMOLTON.—May 28.—For Building Police Station. Mr. E. Harbottle, Architect, County Chambers, Exeter.

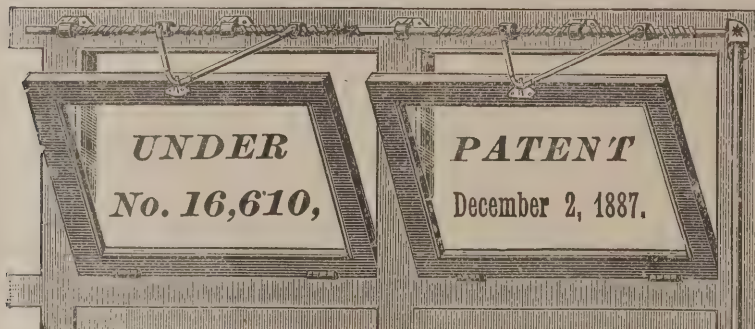
STAMFORD.—May 30.—For Building Technical School. Mr. J. C. Traylen, Architect, 16 Broad Street, Stamford.

STORRINGTON.—May 31.—For Building House. Mr. Wm. Buck, Architect, 60 West Street, Horsham.

TONYPANDY.—June 11.—For Building School. Mr. J. Rees, Architect, Hillside Cottage, Pentre, Rhondda.

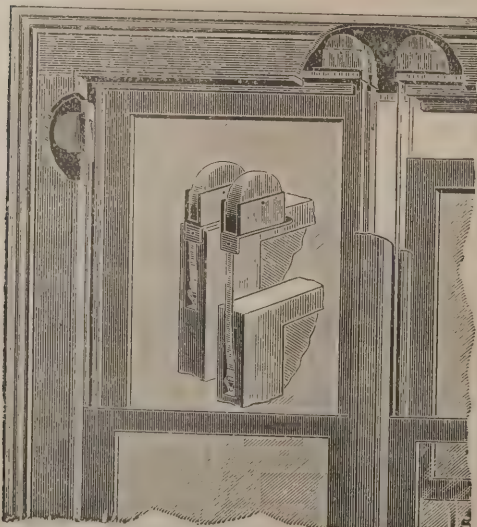
TOTTENHAM.—May 29.—For Bandstand, Bruce Castle Park. Mr. P. E. Murphy, Engineer, 712 High Road, Tottenham.

TREDEGAR.—June 11.—For Additions to School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.



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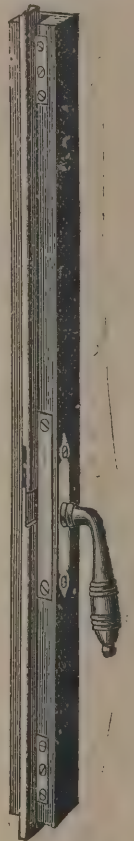
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 YEOVIL.—June 18.—For Building Board Schools. Mr. J. N. Johnston, Architect, 21 Princes Street, Yeovil.
 WANSTEAD.—May 25.—For Repairs to Board Schools. Mr. John T. Bressey, Architect, 70 Bishopsgate Street Within.
 WEST HARTLEPOOL.—May 29.—For Building Public Abattoirs. Mr. J. W. Brown, Borough Engineer.

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Gibson	2,588	0	0
Hunt	2,563	0	0
Darvell	2,535	0	0
Fincker	2,497	0	0
Honour & Son	2,476	0	0
Abbott & Sons	2,370	0	0
Bailey	2,348	0	0
A. Mead	2,300	0	0
Wallis & Sons	2,255	0	0
Stone & Mead	2,149	3	0
Jewell	1,650	0	0

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For the Erection of the New National Bank and Manager's Residence. Mr. WILLIAM BATT, Architect, Royal Avenue, Belfast. Quantities by Mr. S. C. HUNTER, Surveyor.

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Robert Corry, Belfast	15,000	0	0
W. J. Campbell & Son, Belfast	14,950	0	0
H. & J. MARTIN, Lim., Belfast (accepted)	14,235	0	0

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Wilkinson Bros., Finsbury Park	7,997	4	0
J. Neave, Forest Hill	7,306	0	0
T. Rowley, Tottenham	6,947	15	11
W. Jenkins & Son, Leamington Spa	6,920	18	11
J. Brand, Grays	6,900	0	0
J. Young & Son, Llangefni	6,864	0	0
S. Hipwell, Wisbech	6,485	15	9
G. Wimpey & Co., Hammersmith	6,399	0	10
B. Cooke & Co., Battersea	5,649	0	0
G. Osenton, Westerham	5,630	0	0
T. Adams, Wood Green	5,456	17	3
D. H. Porter, London	5,398	0	0
J. Jackson, Forest Gate	5,174	1	11
J. Dickson, St. Albans	5,090	7	1
G. Bell, Tottenham	5,051	9	8
ELKINS & Co., Hertford (accepted)	5,100	0	0

BIDEFORD.

For Building Municipal Schools of Science and Art, Manor Wharf, for the Town Council. Mr. WILSON, Architect.

J. Julian, Truro	£2,768	19	0
Lamerton, Bideford	2,344	5	0
E. Ellis, Bideford	2,129	0	0
T. Bachway, Bideford	1,896	0	0

BRISTOL.

For Building Board School, Barton Hill, Bristol. Mr. FREDK. BLIGH BOND, Architect, Liverpool Chambers. Quantities by Mr. W. L. BERNARD, St. Stephen's Chambers.

J. PERROTT (accepted)	£5,457	10	0
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For Providing and Fixing Cast-iron Fences, Entrance Gates, &c., Recreation Ground, Southdown Road. Mr. FRANCIS J. C. MAY, Borough Engineer, Town Hall, Brighton.

Albion Iron Co., London	£729	10	0
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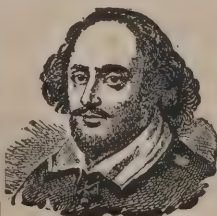
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Siemens Bros. & Co., Limited	2,560	0	0
Brush Electrical Engineering Co., Limited	2,450	0	0
Easton, Anderson & Goolden, Limited	2,125	0	0
Crompton & Co., Limited	2,110	0	0
ELECTRIC CONSTRUCTION CO., LIMITED, Wolverhampton (<i>accepted</i>)	1,731	17	0

BUSHBURY.

For Additions to National Schools. Messrs. J. R. VEAL & SON, Architects, Wolverhampton.			
J. Reynolds	£211	6	0
J. BILSON, Wolverhampton (<i>accepted</i>)	191	11	0

CANTERBURY.

For Building Infectious Hospital, Bekesbourne, near Canterbury. Mr. W. J. JENNINGS, Architect, Canterbury. Quantities by the Architect.			
Slade, Maidstone	£2,234	0	0
Mount, Canterbury	2,225	0	0
Denne & Son, Deal	2,180	0	0
Lovell & Sons, Wingham	2,164	0	0
Knight, Barham	2,128	0	0
Adcock, Dover	2,082	0	0
Martin, Ramsgate	1,998	0	0
BELSEY, Canterbury (<i>accepted</i>)	1,800	0	0
Skinner, Chatham (<i>too late</i>)	1,720	0	0

CARLISLE.

For Sewering and Road Formation, Scotland Road Estate, Stanwix. Mr. JOHN F. HODSON, Architect, Cecil Street, Carlisle.			
R. Little	£575	0	0
T. Scott	445	0	0
T. Ormiston	430	0	0
T. Creighton	430	0	0
J. & W. Baty	426	0	0
BEATY BROS. (<i>accepted</i>)	401	7	9

CHARLBURY.

For Alterations and Additions to Sandford Hill House, Charlbury, Oxon, for Mr. F. W. P. Martin. Mr. ERNEST R. BARROW, A.R.I.B.A., Architect, 7 John Street, Adelphi, London, W.C.			
BURDEN (<i>accepted</i>)	£804	11	0

CHESHUNT.

For Building Six Villas at Cheshunt. Mr. JAMES BUNCE, Surveyor, Turner's Hill, Cheshunt.			
England & Gale, Bow	£4,320	0	0
White, Enfield Highway	4,213	0	0
Milling, Battersea	3,500	0	0
Surveyor's estimate	3,300	0	0

CLEETHORPES.

For Works in Connection with West Street, for the Cleethorpes Local Board. Mr. T. ROWLAND, Engineer, Town Hall, Louth.			
C. Adlard, Louth, Eastgate	£894	13	6
Thompson & Son, Grimsby	807	0	0
J. H. Vickers, Nottingham	695	18	7
T. Mason, Hebden Bridge	681	17	2
R. Hopkinson, Halifax	643	12	0
Brunton & Son, Hull	599	12	4
C. A. Walker, Grimsby	541	18	6
G. WALKER, Leeds (<i>accepted</i>)	528	15	0
Sharman & Son, Grimsby	510	6	9
Engineer's estimate	617	18	7

DAVENTRY.

For Building Retort-house and Chimney, &c., for the Daventry Gas and Coke Company, Limited.			
Neal & Bosworth, Daventry	£522	10	0
T. ADAMS, Daventry (<i>accepted</i>)	453	0	0

ENFIELD.

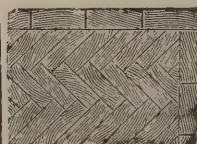
For Construction of a 12-inch Pipe Sewer, 6-inch Cast-iron Rising Main, Sewage Tank and Engine-house on the East Barnet Road, for the Enfield Local Board. Mr. WILLIAM KETTERINGHAM, Surveyor, Court House, Enfield.			
W. Pavey, Winchmore Hill	£749	17	6
W. Nicholls, Wood Green	729	10	0
J. Jackson, Enfield	713	10	0

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W. H. VEYSEY, Architect, 14 Bedford Circus, Exeter.		
Heath & Son, Exeter	£4,489	0 0
Pollard, Taunton	4,250	0 0
Luscombe & Son, Exeter	4,200	0 0
Westcott & Austin, Exeter	4,135	0 0
Phillips, Exeter	4,100	0 0
Herbert, Exeter	3,877	0 0
Gibson, Exeter	3,867	0 0
Setter Bros., Exeter	3,810	0 0
Martin, Exeter	3,807	0 0
Tree & Bolley, Exeter	3,797	0 0
Stephens, Exeter	3,693	0 0
HAM & PASSMORE, Exeter (accepted)	3,687	0 0
Brealey, Exeter	3,400	0 0

GUSTARD WOOD.

For Building Dwelling-house at Gustard Wood, for Mr. F. Wright.		
W. Sparrow, Harpenden	£697	10 0
C. Miskin, St. Albans	614	0 0
Goldhawk & Son, Kimpton	519	0 0
O. ODELL, Wheathampstead (accepted)	479	10 0

HEMEL HEMPSTEAD.

For Additions to West Herts Infirmary, Hemel Hempstead.		
Mr. T. FOSTER WOODMAN, Architect, St. Albans.		
E. Smith	£350	0 0
W. Sear	350	0 0
E. HORN (accepted)	337	0 0

INVERNESS.

For Dredging about 14,000 Cubic Yards in the River Ness, Causewaying and Metalling at Thornbush Quay. Mr. JAMES FRASER, Engineer, Inverness.		
D. Matheson, Inverness	£5,104	15 10
J. H. Smith, Inverness	4,775	1 8
T. Macdonald, Inverness	4,559	19 2
R. Fraser, Inverness	3,787	15 2
G. Lawson, Rutherglen	3,576	15 0
R. C. Brebner, Edinburgh	1,955	5 0
CROSSLEY, TILBURN & Co., Glasgow (accepted)	1,954	17 6

HAMILTON.

For Works for Lunatic Asylum being Erected at Hartwood, in the Parish of Shotts, for the Lanark District Lunacy Board. Mr. JOHN L. MURRAY, I.A., Architect, Heavy-side, Biggar.

Uncimbable Iron Fencing.

T. Gibson & Son, Edinburgh	£2,371	3 6
A. & J. Main & Co., Glasgow	2,150	7 9
R. Ferguson, Carnwath	1,876	18 2
J. Sommerville, Shotts	1,875	5 0
P. & R. Fleming & Co., Glasgow	1,855	6 3
A. Gibson, Whiteinch	1,846	19 0
W. Bain & Co., Coatbridge	1,817	18 0
Brownlie & Murray, Glasgow	1,751	15 6
G. B. SMITH & Co., Glasgow (accepted)	1,604	8 9

Wire Fencing.

T. Gibson & Son, Glasgow	487	1 6
Economic Fencing Company, London	443	12 0
W. Bain & Co., Glasgow	397	6 0
A. & J. Main & Co., Glasgow	395	0 0
J. Sommerville, Glasgow	390	11 0
R. Ferguson, Glasgow	388	19 0
P. & R. Fleming & Co., Glasgow	367	18 0
G. B. SMITH & Co., Glasgow (accepted)	357	1 6

Earthwork.

W. C. Harvie & Co., Pollokshaws	4,262	5 3
J. Kirkwood, Pollockshields	4,016	4 11
W. G. Flitt, Stonehouse	3,976	8 10
T. Pate & Son, Airdrie	3,320	15 8
T. Crawford & Sons, Wishaw	3,147	11 0
D. Murray, Glasgow	2,968	9 2
J. FRENCH, Edinburgh (accepted)	2,590	3 9

LLANSAMLET.

For Building Mixed School at Birchgrove to accommodate about 230 Children, for the Llansamlet Higher School Board. Mr. REES LLEWELLYN, Architect, Birchgrove House, Llansamlet.

D. Jenkins, Swansea	£2,800	0 0
E. Thomas, Seven Sisters	2,794	0 0
T. Watkins & Co., Swansea	2,677	0 0
D. & G. Beynon, Neath	2,500	0 0
D. Rees, Ystalyfera	2,495	0 0
Gustavus Bros, Swansea	2,339	5 0
H. DAVID & SONS, Neath (accepted)	2,350	0 0

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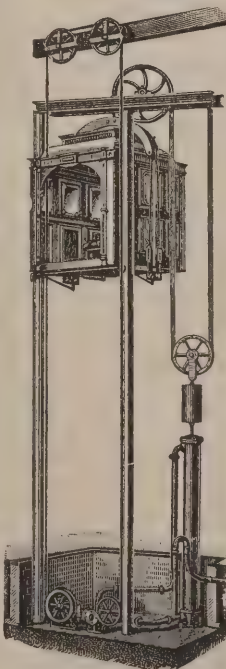
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"Model Dwelling," New-castle Exhibition, 1887.

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Larke & Son	£184	0	0
Stevens Bros.	88	0	0
HOCKING (accepted)	85	0	0

PENRHIWCEIBER.

For Building Thirty-six Cottages at Penrhiwceiber, for the Penrhiwceiber Building Club.

Cottages, Road and Fencing.

T. Rees, Merthyr Vale	£7,103	0	0
E. Owen, Aberdare Junction	6,932	0	0
R. Owen, Aberdare Junction	6,780	0	0
G. Cheen, Aberdare Junction	6,728	0	0
J. Lewis, Treharris	6,563	0	0
Jones & Rowlands, Ynysybwll	6,372	0	0
S. Hawkins, Merthyr Tydvil	6,300	0	0
J. Rees, Ynysybwll	6,061	0	0
H. Powell, Pontypridd	5,940	0	0
W. BUDDING, Cefn Tydu, Mon. (accepted)	5,940	0	0

Cottages only.

J. Wood & D. Jones, Navigation	6,102	0	0
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POOLE.

For Construction of Drying Closet, for Hot-water Supply to Baths, and for Additions and Alterations to Stone-cracking Sheds, and other Works, for the Guardians. Mr. H. F. J. BARNES, Architect, Poole.

Drying Closet.

Saunders, Longfleet	£156	0	0
Joseby	109	10	0
Tucker	85	0	0
J. W. BACON (accepted)	78	10	0

Hot-water Supply.

Saunders	74	0	0
BACON (accepted)	29	5	0

Stone-cracking Sheds.

Saunders	42	0	0
T. C. RIGLER, Longfleet (accepted)	37	10	0

Boiler-house, Piggery.

Tucker	46	10	0
T. C. Rigler	40	0	0
SAUNDERS (accepted)	38	0	0

PORTH.

For Building Cottage Hospital at Porth, for the Porth Cottage Hospital Committee. Mr. F. GIBSON, Architect, Midland Bank Buildings, Pontypridd.

E. C. Newby & Co., Cardiff	£2,980	0	0
Williams & James, Pontypridd	2,805	0	0
H. Powell, Pontypridd	2,795	10	0
D. C. Jones & Co., Gloucester	2,789	0	0
C. JENKINS & SONS, Porth (accepted)	2,775	0	0

RUGELEY.

For Supply of Pipes in Connection with the Water Supply, Rugeley.

Butterley Ironworks, Derby	£2,425	19	0
Cochrane & Co., Dudley	2,212	3	0
J. T. Salisbury, Burton	2,196	13	8
Stoney Iron Company, Chesterfield	2,180	7	6
Clay Cross Company	2,164	4	5
Stanton & Co., Nottingham	2,137	7	5
WOODROFFE & CO. (accepted)	2,137	0	0
J. Oakes & Co., London	2,120	4	0
J. S. Roberts, West Bromwich	2,040	17	0

RYHILL.

For Building Primitive Methodist Chapel at Ryhill, near Wakefield. Mr. WALTER E. RICHARDSON, Architect, Imperial Buildings, 28 Bond Street, Leeds.

Accepted Tenders.

G. Parker, Hemsworth, brick and mason	£455	0	0
E. Cuttle, Hemsworth, joiner	344	4	6
J. Snowden & Son, Ossett, plumber and painter	60	0	0
T. E. Heavyside, Leeds, slater	51	18	0
J. E. Cookson, Heckmondwike, plasterer	29	0	0

ST. ALBANS.

For Re-arranging Lavatories and Connecting Drains to Sewer at Workhouse, St. Albans. Mr. T. FOSTER WOODMAN, Surveyor, St. Peter's, St. Albans.

C. Miskin	£433	0	0
J. Dickson	395	0	0
G. CAPPER (accepted)	320	0	0

For Building Pair of Villas, Granville Road, St. Albans, for Mr. G. Slade. Mr. T. FOSTER WOODMAN, Architect.

C. Miskin	£1,050	0	0
J. Voss	985	0	0
J. & W. SAVAGE (accepted)	936	0	0

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STEYNING.

For Painting and Distempering Workhouse Infirmary.

Trussell	£125	0	0
Saunders	68	0	0
B. R. Oliver	57	0	0
BERRY, Portslade (accepted)	53	10	0

SUTTON COLDFIELD.

For Building Church House, &c., at Sutton Coldfield, for the Committee. Mr. W. J. LANGLEY, Architect, Holland Street, Sutton Coldfield.

J. Simons, Aston	£2,100	0	0
G. Gill, Birmingham	2,050	0	0
R. Fenwick, Birmingham	1,999	0	0
W. Hopkins, Birmingham	1,995	0	0
W. & J. Webb, Birmingham	1,980	0	0
J. Turville & Son, Sutton Coldfield	1,959	0	0
Gowing & Ingram	1,807	0	0

WATFORD.

For Levelling, Paving, Metalling, Flagging, Channelling, Lighting Westland Road, Wellington Road and Canterbury Road, for the Watford Local Board. Mr. D. WATERHOUSE, Engineer.

Wellington Road.

W. Tearle, Watford	£230	0	0
F. DUPONT, Watford (accepted)	223	0	0

Westland Road.

W. Tearle	330	0	0
F. DUPONT (accepted)	315	0	0

Canterbury Road.

W. Tearle	225	0	0
F. DUPONT (accepted)	207	0	0

WISBECH.

For Casting and Fitting of New Pump Barrels to Sewerage Engine in Tinker's Drove, for the Wisbech and Walsoken Local Board. Mr. ARTHUR H. PLOWRIGHT, Engineer, Exchange Square, Wisbech.

Thornton & Crebbin, Bradford	£120	17	6
F. Savage, Lynn	65	0	0
Chatteris Engineering Company, Chatteris	55	0	0
L. H. Palmer, Wisbech	50	8	0
A. DODMAN, Lynn (accepted)	43	17	0

WALTHAMSTOW.

For Supply of Furniture and Fittings to the new Public Library, for the Library Authority, at High Street, Walthamstow. Mr. J. WILLIAMS DUNFORD, M.S.A., F.I.Inst., Architect, 100c Queen Victoria Street, E.C.

McMillan & Houghton, Great Portland Street	£772	0	0
Howlett, Mile End	745	0	0
Atkinson & Co., Westminster Bridge Road	705	0	0
Hammer & Co., Strand	700	0	0
Syer & Co., Finsbury Square	694	0	0
Smee & Cobay, Moorfields	679	18	0
Barrett & Power, Hackney	654	15	0
Powditch, King's Cross	638	0	0
Spencer, Fenchurch Street	631	10	0
Roberts, Islington	596	3	9
Godson & Son, Kilburn	563	0	0
Shoolbred, Oxford Street	548	3	6
Cohen, Curtain Road	542	10	0
Educational Supply Association	529	0	0
Taylor & Co., Driffield	525	0	0
Rous, Grays	523	0	0
Wake & Dean, Southwark*	510	0	0

* Accepted subject to the approval of the Local Board.

WIMBLEDON.

For Construction of Surface-water Outfall from Haydon's Road to the River Wandle, and Erection of Injector Station, Air and Rising Mains, and a Short Length of Sewer for the Drainage of the Eastern Portion of Durnsford Road, for the Wimbledon Local Board. Mr. C. H. COOPER, Engineer.

B. Cooke & Co., Battersea	£1,325	0	0
E. ILES, Wimbledon (accepted)	1,270	9	7

At the meeting of the Vestry of St. George's, Hanover Square, the rector (Rev. D. Anderson) brought up a report on behalf of himself and the churchwardens proposing to apply for a faculty to carry out certain alterations in the parish church, at an estimated cost of 3,000*l*. The alterations will include the removal of a gallery, the enlargement of the organ, and the reseating of the church in accordance with a plan prepared by Sir A. Blomfield.

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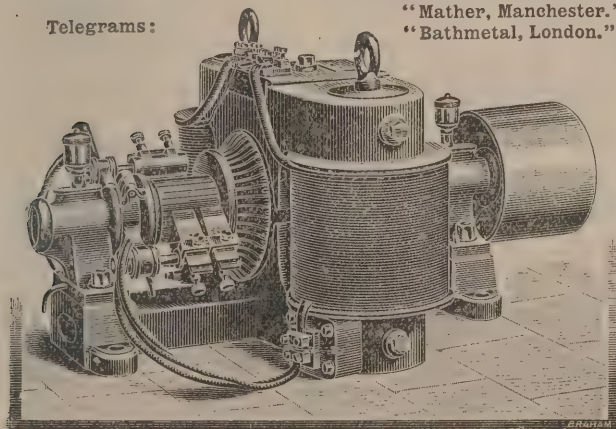
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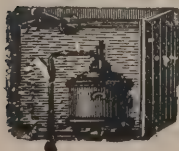
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TRADE NOTES.

IN reference to a paragraph that appeared in last week's issue of *The Architect*, Messrs. H. Parsons & Harris write to us that their radiators were selected for St. Bride's Institute, Bride Lane, E.C., but are being fixed by the contractors for the work.

MESSRS. R. WAYGOOD & CO. are now erecting suspended hydraulic passenger lifts as follows:—For Messrs. Harvey, Nicholls & Co., Knightsbridge; Gower House, Gower Street, W.; the Grocers' Hall, Princes Street; Messrs. S. & P. Erard, Great Marlborough Street; Messrs. L. Schwabe, Manchester; Corn and Produce Exchange, Manchester; Salvation Army, Queen Victoria Street; Kensington Hotel, for which they are also making several goods and luggage and dinner lifts. They are also erecting the following lifts and cranes, which are all designed to work on their patent water-saving principle. This system is a new departure, by which the water used by a lift or crane is apportioned to the load to be raised, a feature which has not been successfully accomplished hitherto:—Two suspended hydraulic goods lifts for the Army and Navy Stores, Westminster; suspended passenger lift for Mr. T. Joynson, Liverpool; suspended passenger lift for Moorgate Court, Moorgate Street, E.C.; two suspended goods lifts for Messrs. Falk, Stadelmann & Co., Farringdon Road; direct-acting passenger lift for London Commercial Sale Rooms, Mincing Lane; suspended passenger lift for Mr. John Phelps, Milk Street, E.C.; two hydraulic cranes for Messrs. Nicholls & Clark, Shoreditch, E.; one hydraulic crane for Messrs. Petty, Wood & Co., Southwark Bridge Road, S.E. They are also altering Messrs. Derry & Tom's passenger lift, and the passenger lift at the flats, 11 Portland Place, to work on this system.

MESSRS. HORNE, SON & EVERSFIELD have been instructed by the Commissioners of H.M. Works to sell by auction, in lots, on the premises, on Tuesday, May 29, at 12 o'clock precisely, the materials of the Albert Palace and Connaught Hall, comprising about 1,000 tons wrought and cast-iron, in girders, columns, principals, &c., all of which could be easily taken down and re-erected or made use of for smaller buildings, thus affording an exceptional opportunity of acquiring the costly ironwork used in the construction of concert halls, gymnasiums and other buildings at a comparatively small outlay; 1,000 feet iron railing, 16,000 feet of 4-inch and other flanged hot-water piping, 500 ornamental gratings, 1,100 squares capital flooring, with sound joists and timbers under, fittings

of lavatories, double and single flights of stairs, zinc, bricks, rolled and other glass, and the large variety of fixtures and fittings necessarily appurtenant to so large a building; also certain plaster casts and busts, pictures, and other unowned property.

WE notice that Mr. John Clark has just issued a repolishing and lacquering sheet, as he is now making a specialty of this work, having just completed the fitting up of a new department for the purpose.

THE Wolverhampton Town Council have accepted the tender of Messrs. Humphreys, London, for the erection of a temporary iron hospital.

THE contract for the erection of the new station at Haymarket, Edinburgh, by the North British Railway Company, has been obtained by Messrs. G. & R. Cousin, builders, Alloa.

THE *Norwich Mercury* says:—Two steamers arrived, wood laden, for Messrs. Jewson, Yarmouth. The *Maja*, from Memel, crossed the North Sea in three days, and arrived considerably sooner than she was expected. She brings between 600 and 700 loads of deals and timber. The *Danehill* brought 1,400 loads of deals, battens and boards from Soderhamn.

ELECTRICAL.

THE foundation-stone has just been laid of the new works now being erected by the Wolverhampton Corporation in Commercial Road, as head generating station for the supply of electric light for public lighting purposes in Wolverhampton. The necessary cables are now being laid down for supplying the light to a certain area, including the principal streets in the centre of the town. The initial cost of the head station works and plant is estimated at 30,000*l.*, Mr. A. P. Brevitt being architect, and Mr. H. Wilcock builder.

THE tender of Messrs. W. & J. Robinson has been accepted by the Bootle Town Council for electric-light installation at 3,224*l.*

AT the Foreign Office electrical engineers have been busy fixing the wires, &c., for the electric light to be installed on the occasion of the official celebration of the Queen's birthday.

THE Llandudno Town Commissioners have passed a resolution opposing a proposal to have the town lit by the electric light.

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HAVE BEEN EXECUTED BY

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This Patent Partition is constructed of Blocks or Slabs of Plaster material, formed with a series of longitudinal Tubes of Fireproof Material to deaden sound, each block being keyed to the adjoining one by light Iron Clamps, the whole being afterwards plastered on either side, and forming a rigid soundproof and fireproof construction.

When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4½ brickwork partition walls. The thickness from face to face is only 3 inches, thus saving enormously in weight and space.

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

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147 STRAND, LONDON, W.C.

AFTER practical tests, a concession has been granted for working canal boats on the New York State canals by electricity.

AN electric-light supply has been installed at the Palace, New Brighton. The installation comprises a gas engine, which drives a 300 light dynamo coupled to a very elaborate switch-board, and two pumps, which throw 1,000 and 2,000 gallons per hour respectively, supplying the whole building with pure spring water.

BUILDING AND BUILDERS.

THE managers of the Aberdeen soup kitchen propose the erection of a new building on the site of the present kitchen in Loch Street, from designs by Messrs. William Henderson & Son. The estimated cost is a little over 1,000*l*.

THE Walsall School Board have adopted plans by Messrs. Bailey & McConnall for the erection of a cookery kitchen at an estimated cost of 1,320*l*.

EXTENSIVE covered tennis, racquet, fives courts, American bowling-alley, gymnasium (having tea-rooms over), laundry, &c., are being erected from the designs of Messrs. Darby & Salter at Cliveden, for the Hon. W. W. Astor. Messrs. Cooper & Sons, Maidenhead, are the builders.

THE improvement committee of the Sheffield Corporation have agreed to sell a site in Pinstone Street. The intending purchaser promoted the Empire Palace of Varieties Theatre in Birmingham, and a similar theatre in Edinburgh, and it is understood that it is his intention to erect a variety theatre for Sheffield.

THE Ayr Dean of Guild Court last year granted linings for new buildings and alterations of properties that were estimated to cost 68,000*l*. The dean stated that there were prospects of building for the coming year which would even exceed the past one.

A NEW police station is to be built at Reigate from the designs of Mr. F. D. Clark, borough surveyor.

THE Greenwich Board of Guardians instructed their architect, Mr. Dinwiddy, to examine and report upon the old system of drainage at the workhouse and advise upon its amendment. He has recommended the abolition of the old sewers and the construction of an entirely new system of drainage and sanitary fittings. The work will shortly be put in hand.

THE foundation-stone of the new Catholic church of St. Patrick, in Dudley Road, Birmingham, was laid on Wednesday, the 9th inst., by Dr. Ilsley, Bishop of Birmingham. The building, which is twelfth-century French, is being erected, at a cost of about 5,000*l*, from the designs of Messrs. Dempster & Heaton, architects and surveyors, of Grosvenor Chambers, Birmingham, Mr. John Bowen, of Baisall Heath, being the builder.

THE baths committee of the Liverpool City Council have decided to adopt the plans of the city surveyor for the erection of new salt-water baths at the pier-head, at an estimated cost of 50,000*l*.

IT is proposed to build a new church to meet the growing requirements of St. Alkmund's parish, Derby.

VARIETIES.

MR. RICHARD TANGYE is to receive the well-merited honour of knighthood in recognition of his munificent aid towards the Birmingham School of Art and Art Gallery, as well as for distinguished public services.

AN inquiry is to be held to-day (Friday) at Yarmouth with reference to the application of the Corporation for sanction to a loan of 3,000*l*. for sewerage works, and one of 1,500*l*. for street improvements.

THE Glasgow authorities have appointed Mr. Donald M'Coll, who has been assistant superintendent of cleansing in Glasgow for several years, superintendent at a salary of 450*l*., in place of Mr. John Young, the former superintendent, appointed to the management of the Corporation Tramways. His salary as cleansing superintendent was 800*l*.

THE Worthing Town Council have decided that application be made to the Local Government Board for sanction to borrow the following sums on security of the general district rates, funds and water rates of the borough, viz. 35,000*l*. for purchase of land, sinking well and other works in relation to the water supply; 26,500*l*. for purchase of the West Worthing Waterworks (including the land and works at Durrington), baths and premises, with the rights, powers and privileges of the company; and 650*l*. for widening and improving parts of Chapel Road, Richmond Road and Montague Street.

THE *Gentlewoman* contains an article by Princess Christian on "Nurses and their Vocation."

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THE Commissioner of Works intends to beautify the site of the Old Law Courts to the north of Westminster Hall. Workmen are engaged laying out flower-beds among the grass similar to those in Parliament Square.

THE imposing structure in Argyle Street known as Hengler's Circus has passed into the hands of the Duval Restaurants Company. Externally the building will remain as it stands, but the interior has to undergo a complete process of transformation, and no expense will be spared to render the restaurant one of the best in London, both from an architectural and gastronomic point of view. Among those interested in the development of the Duval system in London are Prince Philip of Bourbon, the Duke de Morny, the Duke de Montmorency and the Duchess of La Roche-Guyon.

THE lumber manufactured annually in the Dominion of Canada amounts in round numbers to 2,000,000,000 feet, British measure, mostly pine. The Province of Quebec has been producing about 3,000,000 logs annually, furnishing 525,000,000 feet, B. M., of sawed lumber, principally for export. Ontario has made 7,000,000 logs annually for some time past, producing 700,000,000 feet, B. M. A large proportion of the above is shipped to the United States. In addition, Ontario yearly ships to the United States 250,000,000 feet, B. M., in saw logs.

THE borough surveyor of Wednesbury has just submitted his annual report. The total length of streets and roads in the borough is 20 miles 4 furlongs 17 yards. The main roads make up a length of $3\frac{1}{4}$ miles, and the total cost of maintaining these, exclusive of all expenditure in connection with the paving of footpaths, in the year ended March 31, 1893, was 981/18s. 11d., or 302/ per mile. The upper part of Ridding Lane was widened at a cost of 1,213/., and the footpaths of forty-five streets were paved out of the loan of 6,250/ obtained for this purpose. For street-watering purposes 16,347 van loads of the South Staffordshire Waterworks Company's water, representing about 4,250,220 gallons were used; and the expenditure upon manual labour in the several departments under the surveyor's control was 1,833/ 14s. 1½d., as against 1,716/ 3s. in the previous year. The total length of sewers in the borough at December 31 was about twenty-nine miles.

AN inquiry has been held with regard to an application made by the Upper Stour Valley Main Sewerage Board for permission to borrow 110,000/ to defray the cost of the sewerage scheme. It was stated that the total length of the sewers would be about twenty-five miles.

THE Dumbarton Harbour Board have sold their dredger *Leven* to the authorities at Newhaven for the sum of 13,500/.

When new, the vessel cost about 10,000/ more.

THE Pontypridd Local Board have decided to purchase the property of the Markets and Town Halls Company for 31,000/.

THE North-Eastern Railway Company intend to provide additional quay accommodation at West Hartlepool for the timber traffic.

THE design by Mr. S. J. Wilde, architect, submitted by Mr. W. E. Perrett, for the Pigott memorial clock tower to be erected on the sea-front at Weston-super-Mare, was finally selected out of about fifteen sent in.

THE Grays Local Board are about to borrow 6,000/ for sewerage works.

WATERHEAD BATHS, OLDHAM.

THIS building, just opened, is situate on the corner of a plot of land abutting on Cedar Street on the front and Mortar Street on the side, the superintendent's house being placed at the angle of the two streets, having lobby, sitting-room, kitchen and scullery on ground floor, three bedrooms, also cellar. In the centre of the block is ticket-office, well lighted with a large electric-headed bay window. This room is well fitted up with drawers, cupboards for storage of towels, &c. On each side of this room are the male and female entrance corridors, fitted with swing doors, having upper panels glazed with lead lights and separated from ticket-office by glazed screens, with pay-window and registering turnstiles to each, a gate being provided to turnstiles for use of officials, &c. Behind here there is a cross corridor, which leads on the left to twelve male slipper-baths, and on the right to six female slipper-baths, there being a separate waiting-room provided for each sex.

The whole of the slipper-baths are porcelain, glazed both inside and outside, having no wood-framing round whatever. This system is the most sanitary arrangement, as it allows the attendant to have thorough supervision, so that it would be impossible for the slightest dirt to accumulate without his knowledge. Five of the slipper-baths will be used as first-class baths, having showers and other advantages over the remainder. The supply of hot and cold water to the baths is regulated by means of valves worked by a detachable handle by an attendant in the corridors.

From the cross corridor the plunge-bath is reached, the

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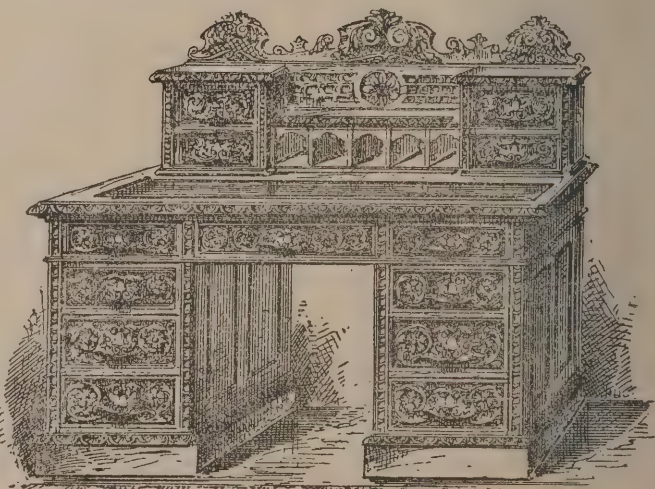
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dimensions of this room being 74 feet by 46 feet, with a water area of 60 feet by 26 feet, the depth being 6 feet 6 inches at one end and 3 feet 6 inches at the other. The bottom is tiled with black and white tiles, formed in panels, the sides being faced with white glazed bricks. A diving platform is provided at the deep end of the bath. Round the gangways are ranged forty-two dressing-boxes, there also being the necessary foot-bath, shower, water-closets, urinals, &c. Six Stott-Thorp pendants, with ornamental wrought-iron scrolls, are provided. The entrances to this bath are so arranged that it can be used by either sex without interfering with private bath corridors.

At the rear of the premises are the laundry and boiler-house, the former being fitted up with all modern requisites, consisting of patent steam-power washing-machine, also rinsing tank with wringer having rollers of vulcanised indiarubber, wringing and mangling machine, drying chamber containing six drying-horses. Four washing-troughs all fed with steam, hot and cold supply, the whole of machinery being worked by steam-power by means of a vertical steam-engine and shafting driven with belting. A two-flued boiler, 15 feet by 6 feet 6 inches, made by the Oldham Boiler Works Company, supplies steam for the whole of the system throughout.

The floors to the whole of baths and corridors are of steel joists, and finished with granite-faced concrete, being plentifully supplied with channels and grids to convey away surplus water.

The baths and corridors have dadoes of white glazed bricks with ornamental bands at top. The whole of the premises are efficiently heated by steam.

The continuous lantern-lights both over plunge and private baths are made to open from end to end for ventilation by means of cranked levers, &c., worked by attendant from the floor.

The whole of the building work has been carried out by Mr. William Lees, the sub-contractors being—excavating, concreting and brickwork, Messrs. S. & J. Smethurst; masonry, Mr. J. Bebbington; steel joists, &c., Mr. Edward Wood, Manchester; wrought ironwork, Mr. J. Kershaw; slating, Mr. Joseph Jackson; plumbing, glazing and painting, Messrs. Harker Bros., and plastering, Mr. David Rothwell.

The whole of the steam, hydraulic and engineering arrangements throughout have been carried out by Mr. W. F. Spencer, Crossbank Works, Oldham, the whole having been executed according to the plans and under the supervision of Mr. Charles T. Taylor, A.R.I.B.A., architect, 10 Clegg Street, Oldham.

ILLUSTRATIONS.

346 STRAND, W.C.—EXTENSION OF PREMISES FOR THE "MORNING POST."

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BIRMINGHAM GAS UNDERTAKING.

At the meeting of the Birmingham City Council on Tuesday Alderman Pollack brought up the report of the gas committee, and moved that the Council authorise the appropriation of 24,551*l.* 15*s* 9*d.*, being the net profit of the gas department for the year ending March 31 last, to the credit of the improvement rate of 1893. He pointed out that there were three important factors in the accounts of the gas department during the year—the coal strike, the decrease in the consumption of gas, and the increase in price. In December last he estimated the additional purchases of coal rendered necessary by the strike at 24,000*l.* This had been reduced to 15,000*l.*, an economy of 8,000*l.* having been effected by reselling the coal practically at the pit as soon as the ordinary contractors had resumed delivery. The estimated saving of coal referred to in the last annual report had also been carried out, otherwise the unfavourable trading of 1892-93 would in itself have necessitated an increase in the price of gas. The advantage thus gained, however, had been entirely lost through the strike. In 1888 they paid for coal 162,000*l.* for an output of 3,500 million cubic feet of gas; in the year 1893-94 their coal cost them 261,000*l.*, or 62 per cent. more, while the output of gas was 4,000 million feet, or only 14 per cent. more. But while the price of coal had gone up until it was even now 50 per cent. higher than in 1888, during the whole of that time the committee had not altered the price of gas. At last they were obliged to increase the price, but notwithstanding this the revenue from gas consumption for the year just ended only showed an increase of 5,858*l.*, notwithstanding that the increased price came into force during the heaviest quarter of the year. For the first time, in fact, since

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the acquisition of the gas undertaking their revenue from gas had been affected by a decrease in the consumption. Discussing this matter in its bearing on the future of the gas undertaking, Alderman Pollack said that the total decrease of consumption last year, taking into account the additional consumption which might have been expected from the increase in the number of court and public lamps, was 100 million cubic feet, or 2 per cent. But taking into account that until quite lately there had been an average annual increase of 4 per cent., this really meant a loss to the department of 6 per cent. on the sale of gas. In the previous year the consumption was stationary, so that the sale two years before actually exceeded by 56 millions that of last year, although the department now supplied the whole of Sutton Coldfield. Was this reduction peculiar to Birmingham, and was it likely to be permanent? In London the Commercial Gas Company reported a decrease of 4 per cent., and the South Metropolitan one of 1½ per cent., while decreases of from 2 to 4 per cent. were reported from the following among other places:—Brentford, the Crystal Palace, Bradford, Bristol, Sheffield, Leicester, Derby and Dublin. In Paris the decrease was 1½ per cent., and the loss of profit 226,000l. The reasons given were everywhere the same—exceptionally light weather, bad trade, the introduction of the electric light, and the adoption of economical gas appliances. The hours of sunshine registered in Birmingham during the year just passed exceeded by 463 those in the previous year, and in the months in which the increases were shown there was a considerable falling off in the consumption of gas. March this year showed a reduction in the hours of sunshine as compared with March of last year, and the reduction in the consumption was consequently only two-thirds per cent., as compared with a reduction of 4 per cent. in the December quarter, when the hours of sunshine showed an increase. With regard to the question of bad trade, St. Mary's, St. Bartholomew's, St. Thomas's, St. Stephen's, St. George's, Ladywood and Duddeston Wards, the manufacturing portions of the city, showed a decrease in the consumption of from 4 to 7½ per cent.; St. Paul's and Deritend Wards, one of 3 per cent.; and Bordesley, Harborne, Nechells and St. Martin's a decrease of less than 1 per cent. There was an increase of from ½ to 5 per cent. in the outlying wards, attributed to new buildings, while in Edgbaston, where the grumblers resided, there was an unaccountable decrease of 7½ per cent., and in Market Hall Ward one of 6·2·3 per cent., no doubt mainly due to the use of electricity. Dealing with

the effect of the competition of the electric light, Alderman Pollack said that in the year ended March 31, 1891, the department supplied to the Town Hall 23½ million cubic feet of gas, to the Post Office 6½ millions, and to the other consumers in the present electric-lighting area 303 millions, making a total of 332½ millions. In the year ended March 1892, the consumption in the area was:—Town Hall, 955,000; Post Office, three millions; other consumers, 339 millions; total, 343 millions. In the year ended March 1893, it was:—Town Hall, 372,600; Post Office, 1½ millions; other consumers, 334 millions; total, 335½ millions. In the year just ended it was:—Town Hall, 358,800; Post Office, 1,284,100; other consumers, 310 millions; total, 311½ millions, so that while the total consumption for the area showed in 1892-93 an increase of 3½ per cent., there were decreases in the last two years of 2·1·7 and 7½ per cent. respectively. It was, therefore, evident to everyone that the competition of the electric light was seriously checking the consumption of gas. As to the fourth reason, it was one which had in the past, and would in the future, still further reduce the consumption. The gas department had always endeavoured to promote the use of gas-saving appliances, believing that a lavish and improvident use of gas was of no advantage to the undertaking. Great strides had been made in the construction of economical gas-burners, especially during the last few years in connection with incandescent burners. In a recent estimate the committee had calculated that by the use of such burners a saving of 50 per cent. could be effected. The question whether the reduction in the consumption of gas in the city was likely to be permanent was not easily answered, but it was important because the committee were constantly providing enlargements of mains and extensions of plant, and it might be prudent to stay their hands in both respects if they abandoned the hope of a continuous increase in the output. They would be very sanguine if they anticipated the phenomenal weather of the last two years; in fact, there had already been a change this year for April and May favourable to the consumption of gas. Trade, unfortunately, was not mending, but it would be contrary to precedent if the present stagnation proved to be permanent, and it was to be hoped that the educational advantages the city was providing for the workers of Birmingham would enable the manufacturers to withstand the tide of competition. On the other hand, it appeared likely that the working of overtime would be abandoned to a great extent, and that would necessarily

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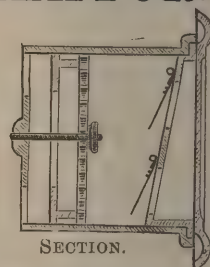
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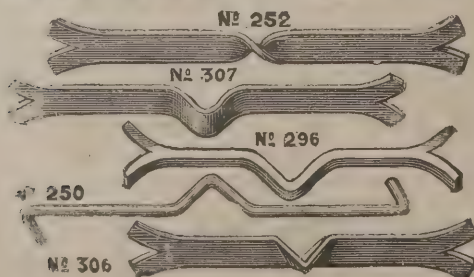
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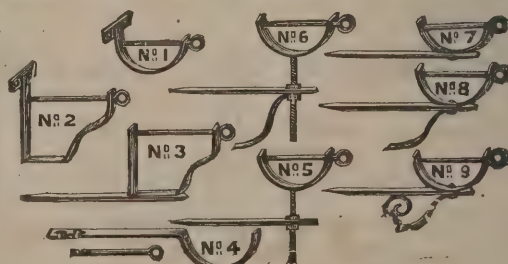


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affect the consumption of gas. There was, however, the fact that the improvements in the construction of gas-stoves and gas-engines had led and were leading to an increase in their use. But it would be idle to deny that the application of electricity to illumination would grow. Taking all these conflicting elements into account he had come to the conclusion that they would no longer see their output take these great strides by which it had risen within eighteen years from 2,300 millions for a larger area, including Smethwick, West Bromwich, Tipton, and other districts which now supplied themselves, to 4,000 millions for the present more contracted area, but that there would still be a gradual though slower increase, mainly governed by the state of the weather and trade, and that it behoved them to be prepared for the reasonable maximum output of gas foreshadowed by the extensions in their plant which the committee had reported from time to time. Except from this drawback of the decreased sale of gas, the accounts had been on the whole satisfactory. The profits from residuals, for instance, had exceeded their most sanguine expectations. They could not, however, have made the contribution to the improvement rate spoken of in the resolution without the higher revenue from gas during the last three months of the financial year due to the increased price. No doubt the Council would be anxious to know how long this increase was to last. All he could say on behalf of the gas committee was, "not one day longer than is absolutely needed." For the last three or four years when coal had risen, when expenditure for wages and purification had vastly increased, when almost every gas undertaking in the kingdom had raised its price, the Birmingham gas committee stood by their old charges for gas until it was impossible to do so any longer. Their anxiety to revert to the old price was no less than it was a year ago. No one was more alive than they were to the advantages of cheap gas in the face of so many competing elements. But it was their duty to present to the Council a clean balance-sheet. The Council would not wish them to follow the example of other gas undertakings in showing a deficit to be carried forward and to be made good by drawing upon their reserve, and so long as the coal market remained in the present unsettled condition, and they were unable to forecast with any degree of certainty their expenditure for coal or their revenue from coke, they must ask the Council to forbear and wait with patience, trusting the Council to take a broad view of the situation, and to act alike in the interest of gas-consumers and ratepayers.

The motion was agreed to.

THE CHICAGO EXHIBITION.

AN exhaustive report of the Royal Commission for the Chicago Exhibition appears in the *Journal of the Society of Arts* for the 18th inst. The following are the commissioners' conclusions on the subject:—

Those who did not visit Chicago cannot understand the enthusiasm which was aroused by the exhibition or credit its genuine character. The exaggerated laudation of the newspapers produced a natural tendency to disbelief; yet, when every allowance is made, it remains a fact that the people of Chicago did produce a display unequalled in many characteristics and in many respects distinctly superior to any previous similar attempt.

The Chicago Exhibition was not merely the largest, but it was certainly the most magnificent exhibition since the first of all exhibitions in 1851. Criticism of many shortcomings would be easy enough, but, after all faults had been found, it is not to be denied that this great undertaking was courageous in its inception, splendid in its execution and successful in its result.

In Europe it was certainly not appreciated at its proper value. The interest which had been aroused by the first announcement of the exhibition and by the preparations for it seemed to fall dead after the opening. Part of this was, no doubt, due to the incomplete condition of things when the exhibition was opened. The buildings themselves were not entirely complete, and in many parts of them the installation of the exhibits had hardly commenced by May 1.

Many English newspapers had sent over representatives to be present at the opening. The reports sent by these gentlemen were of necessity unsatisfactory, and the impression thus created prevailed over the whole duration of the exhibition. Then, too, it must be remembered that all information about American matters comes to Europe from the Eastern States, and they, at first hostile, were never very friendly disposed towards Chicago and its fair.

Thus it came about that the value of much of the energetic work which had been done by the promoters of the fair in advertising it before it was opened was practically lost.

The exhibition was, indeed, fully appreciated in America—at all events, in Western America. The people, not only of Chicago but of Illinois and the neighbouring States, were justifiably proud of their achievement, nor did they hesitate to give full expression to their sentiments in every manner available.

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In all the earlier exhibitions the exhibits themselves were held to be the sole, or almost the sole, attraction; it was sufficient if the buildings furnished suitable shelter and were not unsightly in themselves. At Chicago the great feature was the unique arrangement of the frame of the picture. In all comments upon the exhibition it was the general effect, the splendour of the buildings, the beauty of the situation, which was remarked upon, not the importance or the beauty of the exhibits and the evidence they afforded of industrial or scientific progress.

It was at Paris that this idea was first developed to any extent; at Chicago it was carried almost into excess. Enormous sums were lavished on splendid, but temporary, palaces and pavilions, not by any means particularly well adapted for their ostensible purpose, but impressive and magnificent in appearance, singly or in conjunction with the rest.

Hardly any one of the Chicago buildings—except, indeed, the Fine Arts—was suitable for exhibition purposes. The great Manufactures Building dwarfed the exhibits within it, and was dwarfed by the great structures set up inside it. There was nothing like the fine range of galleries in which the French industrial exhibits were shown in Paris in 1889, galleries than which no buildings could be better adapted for their special object.

Nor does this criticism apply to the great exhibition buildings alone. The numerous and costly pavilions set up by the different States of the Union followed the same intention. As a means of illustrating the natural or manufactured products of the States, these buildings were useless; nevertheless, they satisfied the feeling of State patriotism, and were greatly admired, each by the citizens of the State it represented. The rivalry between the different components of the great American Union is very keen, and it was shown in Chicago by the anxiety of each State to outdo its neighbour in the appearance and character of its building.

The same feeling, too, governed the character of the interior fittings and decorations. The rivalry between the different countries seemed to be—not who could show the finest goods, the newest machinery, the most important invention, but who could erect the most attractive and elaborate structure. It was the manner of showing the goods, not the merit of the goods themselves, which was considered; hence those countries had an advantage in which the Government was the principal or the sole exhibitor, not those who relied upon individual manufacturers. In the former case the exhibit of a country could be

treated as a unit. In the latter, uniform treatment was, at all events, difficult.

A lesson may certainly be learned for guidance in the administration of future exhibitions. If it is desired to make an imposing display it must be done by the subordination of the individual exhibitor to the general effect. Inasmuch as this is not to the advantage of the individual, though it is best for the country in general, it is doubtful whether English exhibitors will ever agree to such a system; but if they do not they must be content to see public attention attracted by the better organisation of their rivals.

This of course means a considerable expenditure by the Government, and a reduction of the cost to the exhibitors. It is certain that a more effective display might have been made by this country at Chicago if a portion of the money spent by the exhibitors had been paid into a central fund and expended under their supervision for the common benefit of the section. Whether this would have been more or less advantageous to the individual manufacturers who exhibited is another question. At all events, it is to be remembered that an exhibiting firm advertises not only its own wares but the wares of the country it represents, and English trade as a whole benefits from the exertions of the few of its representatives at a foreign exhibition. Probably in the long run more advantage would be gained if the several trades would recognise this fact, and would see that it is their duty to exhibit collectively. The rivalry one against another ought to be forgotten for the moment or merged in a general effort to compete successfully with the representatives of other countries.

Another great feature of the Chicago Exhibition was the extent to which amusement was provided for the visitors. Here, again, was an elaboration of Paris. In the older exhibitions the exhibits formed the attraction; now people have to be attracted to see them by every means. This system was no doubt commenced in the South Kensington Exhibitions, where first electric light was used for exhibition purposes and evening opening became possible. It was carried to a much larger extent at Paris, and received its full development at Chicago. There the title of "World's Fair" was fully justified. The large area of the exhibition given up to the purposes of amusement resembled nothing so much as a gigantic fair; every country on the globe contributed something; there were sights and shows of every sort from everywhere. Still it would not be fair to attribute the great crowds who visited the exhibition simply to the amusing side of it, for though the Midway

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Plaisance was the most crowded part of the exhibition, the picture galleries were always full, and so were the Manufactures and the other main buildings.

The final question of an exhibition, as it is the first which is asked when the idea of an exhibition is set on foot, is as to the advantage to be gained by it. Of the advantage to Chicago, and, indeed, to the Western States of America, there can be little doubt. Chicago desired advertisement, and she had it; the name of that city is known now all over Europe, in quarters where two years ago it had hardly been heard of. Whether there is any genuine profit to be made out of this remains to be seen. In the matter of actual pecuniary profit, it is probable that Chicago gained a good deal. The city and the inhabitants subscribed, perhaps, 8,000,000 dollars; but much more than this sum must have been brought in by the foreigners and the visitors from distant parts of the country.

And the great bulk of visitors profited, if not in money at all events in knowledge and education. To the laborious people of the Western wheatfields, familiar with what surely seems to us the dullest and dreariest form of human existence, absolutely ignorant of the arts and luxuries of life, the exhibition was a revelation. No such opportunity had ever been offered the people of the Western States of seeing the latest results of civilisation; what had been done by science for the amelioration of human life; what had been done by art for its adornment. They availed themselves of the opportunity to the full. They came in thousands, ready to profit by all they could see, and the lessons which they took back to their Western homes will certainly not be without an abiding effect on the future of American civilisation.

To foreigners, on the other hand, it is a more important consideration whether they gain any material advantage from an international exhibition such as that just concluded at Chicago. That if one of the great trading nations of the world takes part in an exhibition, the others must do so is a foregone conclusion. It is certain that had we not taken a prominent part at Chicago the result would have been disastrous to our trade. But we had less to gain than any of our rivals. The problem for British commerce is to hold what we have gained. The problem for that of other countries is how best to obtain a share of what we now hold.

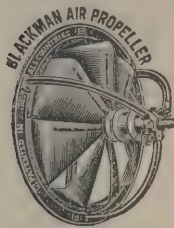
In a protectionist country an international exhibition is something of an anomaly, but that is all the more reason that those who profit by free trade should avail themselves of the opportunity to read the protectionists a lesson. It can hardly

be doubted that the evidence afforded at Chicago of the vastly cheaper rates at which many classes of goods could be obtained were they imported instead of being produced in the country made a profound impression on many shrewd observers. From this one cause alone we may expect considerable advantage to our trade.

That so small a number of foreigners visited the exhibition was a disadvantage to us. Our exhibitors were able to appeal only to the American public, not, as was reasonably expected, to a public gathered from all parts of the world. Yet, even then, it must be remembered that the United States, spite of tariffs, remains England's best customer among foreign nations, and that it is far more important for us to stand well in her markets than in the markets of any other country. Hence it may be taken for certain that we were well advised in making the efforts which were made to stand well at Chicago, and we may feel assured that those efforts will not be without useful practical results. It may be added that we should have been wiser still had our manufacturers been less inclined to dread the effects of protectionist tariffs, and if a larger number had come forward to take their share in maintaining the position we have taken on so many previous similar occasions.

The rivalry at Chicago was keener than ever before. Never have our manufacturers had to meet competition so powerful and so well organised. But if the task was more difficult, its accomplishment may be considered as the more satisfactory, and, as it may be hoped, so may it reasonably be expected, that the care expended and the expense undertaken by so many of our leading manufacturers may not be without their due reward, both to the individual competitors and in their wider results on the trade and commerce of the country.

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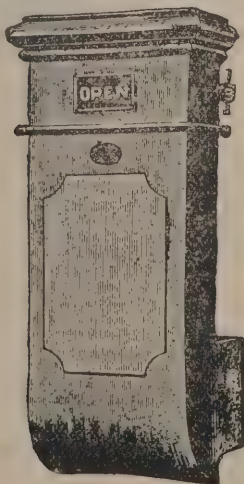
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MASONS AND BRICKLAYERS IN ITALY.

THE masons and bricklayers (*muratori*) of Italy have established several co-operative societies or associations. They differ in one essential principle from other bodies of workmen since they cannot produce irrespective of the demand for their goods, but are obliged to work to order. The published list includes forty-three masons' co-operative societies, of which thirty-one are legally recognised, eleven are unrecognised and one is affiliated to a benevolent society. The Fourth Congress of Italian Co-operators mentions in addition a society which was about to be formed at Forlì to defend the masons against the intrigues of contractors.

All the masons' societies have a capital formed by means of shares payable by instalments. Some admit only working members (masons and operatives of kindred trades); others have both working and non-working members; others, again, take a middle course, and admit as members workmen and co-operative and other societies, but no private individuals who are not labourers. The object of these societies is to contract for work to be carried out by the members. Generally, however, they also employ extra hands, who are paid like ordinary workmen. The members receive wages and a share in the profits.

The societies of Imola, Milan and Cesena represent three typical forms of masons' associations. From the co-operative point of view the best type seems to be that of the Imola Society. Only workmen are admitted. The members are effective and co-operating. In the first class are entered the founders and those co-operating members who have reached the age of twenty-one, and have belonged to the Society for three consecutive years. The second class comprises those who have been members for three years and are eighteen years old. A new member is not formally bound to the Society during his first year. No member may possess more than fifty shares. The shareholders receive a dividend of 20 per cent. upon the annual profits if this does not exceed 6 per cent. on the paid-up capital. The remainder is divided in the following proportions—75 per cent. in equal parts to the effective and co-operating members respectively, the master masons to have twice as much as the journeymen, 20 per cent. to the benefit fund and 5 per cent. to the reserve fund. Sick members are not to lose their right to share in the profits, provided that their illness does not last more than three months. No member may undertake work independently of the association.

At Cesena there are two kinds of shares—those subscribed for by working members (masons, smiths, carpenters, stone-cutters, glaziers, varnishers, day labourers), and those subscribed for by any other class of persons. One-half of the profits is divided among the shareholders who fall under these two categories, but not more than 5 per cent. may be paid on shares of the second kind; the other half of the profits goes to the reserve fund and to the benefit fund. This Society has been accused of a tendency to become an association of capitalists. It has certainly lost sight of the true co-operative principle of employing only its members, and relies largely on independent hired labour.

Only working members are admitted to the Masons' Society at Mantua. No member may hold more than five shares. The shareholders have half the profits; the remainder is paid to the members in proportion to the amount of work done by them. With the exception of the Imola Society, this is the most strictly co-operative of all the masons' associations in Italy. Sir D. Colnaghi mentions that in 1891 it had obtained some contracts from the military authorities.

At Bologna, owing to a defalcation of funds, the Masons' Association encountered difficulties, which it was gradually overcoming when the Foreign Office Report for 1893 was published. The municipality has been able to give the Society several contracts which have been satisfactorily carried out. As the Society has no present capital, however, it labours under certain disadvantages, such as having to pay interest on materials and to hire barrows.

This Association sprang out of a Society which was formed at the end of 1884 by the Bolognese masons in opposition to the middlemen (*imprenditori*). In 1888 this passive resistance took the active form of a co-operative society of production with 400 members and a capital of 12,000 lire, divided into shares of 25 lire and upwards. In the first year of its existence the Association undertook work to the value of 5,200 lire, and by 1890 it held contracts amounting to 180,000 lire.

The report of the Fourth Congress of Italian Co-operators blames the Roman Masons' Society for borrowing money from Government and for involving itself in debt by undertaking work in Greece which it could not carry out. A Government loan of 50,000 lire alone seems to have saved this Association from bankruptcy, and it was regarded as a suspicious circumstance that during the ensuing elections it published a manifesto in favour of the Government candidate.

The Masons' Society at Leghorn was founded in 1889. In

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	GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
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1890 it held contracts for work to the value of 30,000 lire. It paid 40 centimes per hour to the master masons (*muratori*) and 25 centimes per hour to the journeymen (*manovali*). The president received 4 lire per diem, exclusive of holidays.

Co-operative masons' societies have also been started at Venice, where the capital amounts to 27,000 lire; at Parma, where 87 members formed an association in December 1889, and among the builders (*costruttori*) of Padua and the labourers (*braccianti*) of Pisa, who are employed on embankments and in factory building.

The most prosperous of all the associations mentioned by Signor Bodio and by the co-operators' reports is the Masons' Society of Milan, which was founded in 1887, when the Milanese masons were preparing for a strike. This Society distributes its profits on a somewhat elaborate system. It gives 20 per cent. to the reserve fund, 60 per cent. to the shareholders, 14 per cent. to the old age fund, 3 per cent. to assistant workmen, and 3 per cent. to the managers (*amministratori*). The ordinary workmen are completely excluded, and this is the more significant because any one may be a shareholder, and the number of shares held by each member is only limited by the provisions of the Commercial Code.

The Second Congress of Italian Co-operators, held at Milan in 1888, saw the solemn inauguration of the Milanese Masons' Society. In one year this Society executed commissions to the value of 133,000 lire. It was employed by the municipality of Milan on works connected with the new communal cemetery at Musocco, and appears to have carried out its contract punctually and honourably and without disputes. By August 31, 1890, it had executed contracts for work to the value of about half a million lire, giving employment to 150 or 200 members, and its capital amounted to 990 shares of 25 lire and upwards. It was then thinking of forming a fund for infirm members, and with the help of the Savings' Bank of building a co-operative lodging-house for masons who came to Milan.

In 1893 Sir D. Colnaghi stated that the Society had 500 members, with a capital of 27,000 lire, nearly all paid up, and divided into 1,100 shares. The reserve fund amounted to 15,000 lire, and the provident fund to nearly 10,000 lire. It only remains to mention a new departure made by the Milanese masons soon after the foundation of their Society. They bought a plot of land, on which the members of the association built a house, giving up their Sundays for this purpose. Instead of receiving wages for their work the men were paid by a bond, which could

be exchanged for shares in the Society, and thus, without any expense save that of the raw material, the association found itself in possession of a fine building.

"As we cross the Lombard plains," writes Signor Romussi in his report on the progress of Italian co-operation in the year 1887-88, "we see rising up before us the ancient *campanile* erected, stone by stone, by the Sunday labour of the peasants; these are the witnesses of their faith; the house built by the masons of Milan will bear witness to the new faith of the insignificant 'masses,' who, by unity of action and force of will, have become the authors of their own redemption."

CATHEDRAL DIGNITARIES AND BUILDERS IN NEW SOUTH WALES.

AN application has been made in the Equity Court, New South Wales, on behalf of the Right Rev. George H. Stanton (Bishop of Newcastle) and the Very Rev. Arthur E. Selwyn (Dean of Newcastle) for the continuance of an interim injunction to the hearing to restrain an action at law by John Straub, builder, against them. The statement of claim sets forth that the plaintiffs represented the building committee of the Newcastle Cathedral. One of the defendants, Horbury Hunt (president of the Institute of Architects of New South Wales), had been employed as architect for building the cathedral; and the other, John Straub, was the contractor for the building of the walls of the cathedral, the contract price being 14,853*l*. Some dispute arose about the kind of bricks supplied, it being alleged that they were not in conformity with the contract. Notice was given by the committee to the contractor that the bricks would have to be of the required description. Subsequently the committee gave notice to the architect asking him to certify when 8,000*l*. had been expended, in order that the committee might direct the suspension of the work, a clause in the contract providing for this being done. Mr. Hunt gave the certificate, but in it stated that the contractor was entitled to the sum of 9,262*l*. The sum said to be due beyond what had been paid by the progress certificates (representing 5,500*l*.) was 3,762*l*. In consideration of receiving this 3,762*l*., the contractor agreed to suspend the contract. The committee held that 9,262*l*. was an excessive overcharge, and were advised that the proper amount could not exceed 6,000*l*. The committee further alleged that Mr. Hunt was "so biased by his anger at the opposition of the committee to his wishes

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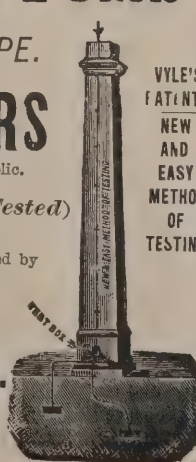
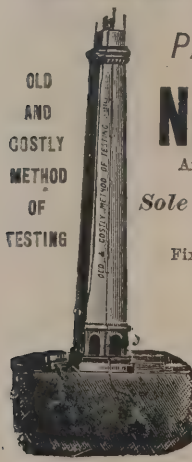
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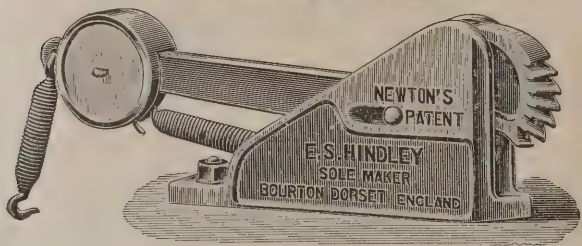
and views that he had not *bona fide* exercised his judgment in signing the certificate." Mr. Straub had since commenced a common law action to recover the 3,762*l.* The motion now before the Court was to continue till the hearing of the equity suit the interim injunction restraining the common law action.

Mr. Justice Owen, the chief judge in equity, said this was an interlocutory application for an injunction to restrain the defendant, John Straub, from proceeding with an action at law against the building committee of the Anglican cathedral at Newcastle. The defendant Straub was the contractor for the building, and he was suing the members of the building committee for the sum of 3,762*l.*, which was the amount certified by Mr. Horbury Hunt, the architect of the building, as at present due to the contractor. The case which was made in the pleadings by the plaintiffs in this equity suit was that the defendant, Horbury Hunt, was unfit to exercise the duties of architect in an impartial and unbiassed manner, and that he had been guilty practically of fraud in charging a much larger amount to the building committee than the amount actually due to Straub, and that his professional vanity had been hurt by not having had the honour and distinction of finishing such a building, and that out of anger and spite he had increased the certificate by a very large amount, and that therefore the Equity Court ought to interfere and restrain the defendant Straub from suing on that certificate, and that the Court itself should take the account and see how much was due for the work done. The charge of bias in the pleadings in the Equity Court appeared to him to be a ground which the defendants in the action at law could plead as against the certificate. He could see no reason why misconduct and incapacity of the person selected as the supreme arbitrator in all matters connected with the contract should not be pleaded just as much in the Court of Common Law as in the Court of Equity. But further than that, the plaintiffs distinctly pleaded collusion between the architect and the contractor, for they made out that the defendant Straub was well aware that the certificate had been given *mala fide*. Unquestionably that was a good plea at law, and that was the very plea which the defendants had set up in the action at law. That being so, there was no reason for the plaintiffs coming into the Equity Court to stay proceedings at law. There was no doubt that at an early stage it was open to either party to have sought the jurisdiction of the Equity Court; but the defendants had proceeded at law, and if the Court of Equity saw that the transaction could be fully dealt

with in the court of law, the Court of Equity would never interfere. Further, in the present case there had been a distinct charge of fraud, not only against the contractor but against Mr. Horbury Hunt, and it appeared to the Court that the Court ought not merely to deal with this case on a question of pleading where a charge of that kind had been made, but that the Court ought to express its opinion of the merits as disclosed in the affidavits. Whatever might be said on the arguments that Mr. Hunt had acted improperly under feelings of irritation and anger, the question for the Court was, What were the facts which had been proved? Mr. Hunt had produced affidavits by eleven architects and contractors, all of them men of high standing and experience—Mr. Mansfield, Mr. Rowe, Mr. Wardell and others—and every one of them said that the certificate was absolutely fair. No doubt some of them had made their calculations from seeing the contract itself and the photographs, and working the thing out not on the spot; but others had visited the spot itself, and the whole of those eleven witnesses swore that the certificate given by Mr. Hunt for the work was perfectly fair and perfectly justified. Against that there was only the evidence of one contractor in Newcastle, who had, no doubt, given his evidence fairly and *bona fide*; but it appeared to the Court that it was a question of judgment, and it was quite possible for a man to make an estimate very much lower than another, both acting perfectly *bona fide*; but when it came to be a question of whether Mr. Hunt had fraudulently made out the certificate or that he had given it from a sort of bias or hostility to the committee, then it appeared to the Court most important to ascertain what were the views of other thoroughly competent men as to the certificate; and they all said it was perfectly fair and just. It was to be borne in mind that that was not the final certificate. It was simply a progress certificate, and according to the evidence, and the law as laid down by the Privy Council, these progress certificates were nothing more than advance notes, and were subject to adjustment from time to time, either upon the issue of another progress certificate or upon the issue of the final certificate. The certificate given by Mr. Hunt was merely a progress certificate, and did not purport to be absolutely correct. Under these circumstances it appeared to the Court that the whole ground was cut from under the plaintiffs' feet. It was clear to the Court that there was no ground whatever for saying that Mr. Hunt had acted improperly in giving the certificate. For these reasons the application would be dismissed with costs.

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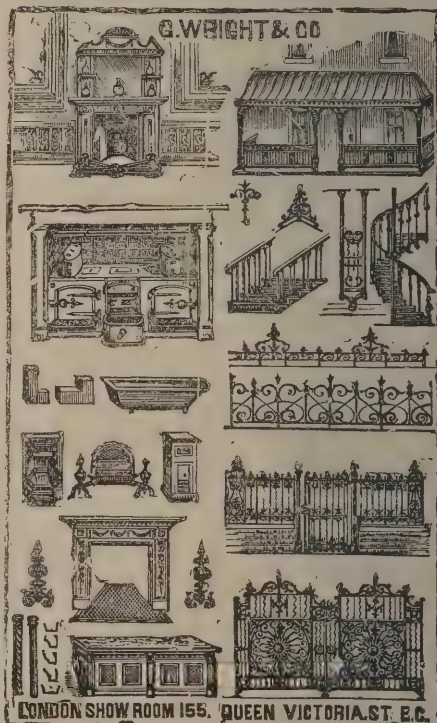
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THE "HERMITE" SYSTEM.

THE two reports that have just been published relating to the Hermite system will be read, says the *Standard*, with a good deal of interest. Great things were claimed for this novel application of electricity, and if these claims prove to be well founded it would perhaps be not too much to say that M. Hermite's discovery would go far to revolutionise sanitary science. Let us look first at the concluding sentences of these two reports to ascertain the results that have been arrived at. We will take Dr. Kelly's first, and as our readers will at once see, he utters no uncertain sound. His words are as follows:—"Since there is no instantaneous decomposition of faecal matter, and no sterilisation of sewage, I am of opinion that the process, so far as the late trials have gone, has therefore failed to produce the results which are claimed for it by its inventor." In marked contrast to this unfavourable view let us quote the exact words of Dr. Piton:—"En résumé, les expériences auxquelles je me suis livré me permettent de conclure que l'eau de mer électrolysée est un désodorisant parfait et un excellent antiseptique, qui détruit très rapidement les micro-organismes les plus résistants, à la condition d'assurer un contact intime du micro-organisme et de l'eau électrolysée." In face of these diametrically opposite opinions the general public may well exclaim, "Who shall decide when doctors disagree?" In this case, however, a brief examination of the methods adopted by the two reporters may go far to show on which side truth probably lies. Dr. Kelly gives the results (1) of his own experiments; (2) of the chemical analysis by Dr. Dupré, F.R.S., of three samples sent to him by Dr. Kelly; and (3) of the bacteriological analysis by Dr. Klein, F.R.S., of St. Bartholomew's Hospital. It is not at all unfair to Dr. Kelly to say that his experiments have no bearing, direct or indirect, on the question of the sterilisation of sewage. In fact, if they have any bearing on the Hermite process at all, it is only on the very subsidiary question of the action of electrolysed water on drainage pipes and fittings. His experiments, so far as recorded, appear to have been limited to a series of investigations into the respective actions of sea water, chlorinated lime solution and Hermite solution, on such substances as mortar, neat cement, cement, clay, paper, indiarubber, dyed leather, thin harness, copper, black iron, galvanised iron, zinc, tin, brass fittings, and so on. It is needless to follow up this subject, as neither its intrinsic importance nor the recorded results of Dr. Kelly would warrant our doing so. Dr. Dupré has reported

with the strict scientific accuracy for which his name is a guarantee. He tested Hermite solution, sea water and sewage treated with Hermite fluid. The last is the point with which the public are concerned chiefly, and we quote the following words from this portion of his report:—"The sample of sewage is evidently of somewhat abnormal character, and does not seem very well suited for experimental purposes. Without a direct comparison between the treated and untreated sewage, it is impossible to say what improvement the treatment has effected. I may say, however, that this sample does not smell like ordinary sewage, and has not developed an offensive sewage smell after a week's keeping."

Dr. Klein had samples of sewage treated with Hermite fluid, of sea water, and of Hermite solution. Dr. Klein's report is too full to quote at length, but we make the following extracts:—"Ordinary raw sewage of London, Manchester and other towns that I have examined, contains between three millions and ten millions of bacteria per 1 cc.; it follows that there has been effected by the admixture of the Hermite solution a remarkable reduction in the number of living microbes, but it also follows that nothing like sterilisation has been produced, since a considerable number of bacteria have survived the process." Dr. Klein also tested the effect of the Hermite solution supplied to him by Dr. Kelly on both cultures of bacillus coli, bacillus of typhoid and cholera vibrios. The result was this:—"All subcultures in broth showed growth. . . . There is one point in connection with this series of experiments which is of importance, and this is that by the addition of the same bulk of Hermite solution to the original normal cultures, the numbers of living microbes had decidedly become reduced, although a good many living examples were still left. . . . It was found that by the Hermite solution the number of living microbes was reduced something like over one hundred times." These quotations show that the reports of Drs. Dupré and Klein, though they contradict the claim of instantaneous sterilisation made for the Hermite process, are in other respects far from unfavourable. For we presume that deodorisation and the reduction of living microbes over one hundred times are points of no small importance.

In marked contrast with the somewhat perfunctory experiments of Dr. Kelly are those of Dr. Piton. Nothing could be more thorough or exhaustive than the researches of the latter observer. He investigated the following points:—The stability of electrolysed sea water with various percentages of chlorine, the stability of a mixture of Hermite fluid with sea and fresh

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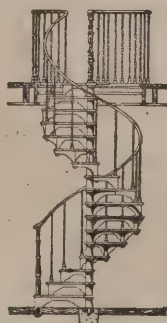


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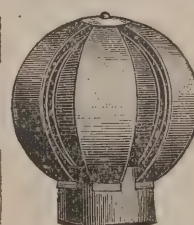
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water respectively, its deodorising power, its solvent action on faecal matter and on paper, the minimum quantity required to sterilise pure microbic cultures, and faecal matter, the minimum of time required for this sterilisation, the effects produced on the matters contained in two closets and diluting syphons of the police office at the commercial port where the Hermite apparatus was fixed, the best percentage to which the electrolysis should be carried to effect thorough antiseptics at the least expense. The Hermite solution was first tested as to stability in open and closed vessels, exposed to and protected from the light. In brief, it was found that exposure to air caused after a time deterioration of the Hermite fluid. In regard to the third point, Dr. Piton asserts that deodorisation is thorough, and that it is not a mere masking of the odours by the free chlorine, as the natural odour once destroyed never recurs. A most exhaustive and complete series of experiments was carried out by Dr. Piton, to ascertain the strength and amount of fluid necessary for sterilisation of pure bacillary cultures, of various specimens of sewage taken under varying circumstances. Experiments were made with pure cultures in broth of the cholera and typhoid bacilli and of the bacillus subtilis in a state of sporulation. The strength of Hermite fluid employed varied from a proportion of 1 per mille free chlorine to '75, '50, '36 and '25. The tubes with the cultures were kept at a temperature of 35 deg. After a contact of half, one and two hours respectively, tubes containing cholera, typhoid and bacillus subtilis cultures remained sterile after four days. 10 cc. of 1 per mille Hermite fluid were used to sterilise 1 cc. of pure culture. The experiments made with faecal matter are too numerous to quote in detail, but the conclusion arrived at is that 40 cc. of 1 per mille Hermite fluid are sufficient to sterilise one gramme of faecal matter, or about six litres for an ordinary evacuation. As might be expected, larger quantities of the '75 and '50 solutions are necessary for sterilisation.

Elaborate experiments were also made as to the time required for sterilisation, but it is unnecessary to go into all these details. We have already quoted the general conclusion at which Dr. Piton arrived as the result of all his experiments. Before the Worthing authorities decide against the Hermite system it would be well that a series of experiments similar to those of Dr. Piton should be carried out. Certainly a question of such vast and far-reaching importance not only to the town of Worthing, but to many other places, ought not to be decided either for or against from the results

of chemical and bacteriological investigation of one or two samples. It may well be that Dr. Kelly has arrived at his conclusion too easily and too hastily, and the question is of such importance that it deserves to be definitely settled one way or the other.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 9011. Julius Christapf Meyer, for "Improvements in window guards."
- 9045. Henry Isidor Dakin, for "Improvements in water-closets, sinks and urinals, and in pipe connections therefor."
- 9110. John Dewrance and George Henry Wall, for "Improvements in cocks."
- 9132. Alexander McLean, jun., for "Improvements in decorative wall surfaces."
- 9208. James Thomas McCabe, for "Improvements in travelling hangers for doors, gates and the like."
- 9224. Robert William Duncan and another, for "Improvements in safety fastenings for windows."
- 9253. Lawrence Rintoul, for "An extending and revolving hinge for windows."
- 9254. John Howie, for "Improvements in and relating to water-closets."
- 9271. Will James, for "An improved casement window."
- 9378. Thomas Pink, for "Improvements in bolts for doors, windows and the like."

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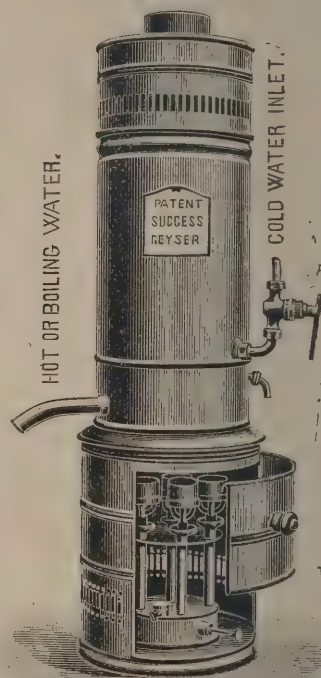
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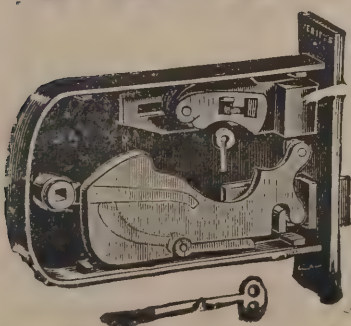
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GATESHEAD.—June 1.—For Building Mission Room. Messrs. Oliver & Leeson, Architects, Mosley Street, Newcastle-on-Tyne.

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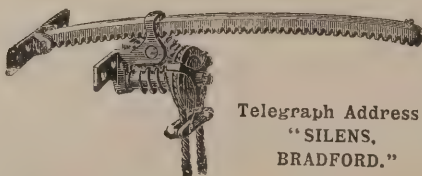
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STOCKPORT.—For Construction of Bridge over River Goyt, Great Portwood Street, Stockport, 60 feet span, in Brickwork; also Retaining Walls and Alterations to the Park Bridge Cotton Mills. Mr. John Atkinson, Borough Surveyor, St. Petersgate, Stockport.

STONEHOLME.—For Building Three Houses. Messrs. J. Butterfield & Son, 58 Curzon Street, Burnley.

STRETTFORD.—June 11.—For Building Forty Dwellings. Mr. John Bowden, 14 Ridgefield, Manchester.

SWANSEA.—June 9.—For Machine and Carriage Sheds. Mr. H. S. Ludlow, 8 Fisher Street, Swansea.

TAMERTON.—For Rebuilding North Aisle of Church. Mr. G. H. Fellowes Prynne, Architect, 6 Queen Anne's Gate, Westminster.

TEDDINGTON.—June 4.—For Construction of about 4½ Miles of 9-inch Stoneware Pipe Sewers, with Manholes, Lamp-holes, Flushing Chambers, Ventilating Shafts and Branch Sewers for House Connections. Mr. Henry York, F.S.I., Elmfield House, Teddington.

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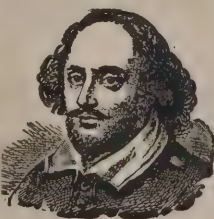
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TOXTETH PARK.—June 8.—For Construction of Six Destructor Cells, with Henderson's Patent Firebars, Boulnois & Brodie's Patent Feeding Arrangement, Multitubular Boiler Cremator, Special Dust Screens, Flues, Dampers and High-level Platform, &c. Mr. John Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park.

TREDEGAR.—June 11.—For Additions to School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

TYLORSTOWN.—June 2.—For Vicarage. Mr. E. M. B. Vaughan, Architect, Cardiff.

ULVERSTON.—June 5.—For Additions to Pennington Schools. Messrs. J. W. Grundy & Son, Architects, Brogden Street, Ulverston.

WAKEFIELD.—For Building Two Cottages. Messrs. Hart & Dawson, Architects, 21 Barstow Square, Wakefield.

WAR DEPARTMENT.—June 7.—For Painting Externally and Internally Buildings and Works at the New Barracks at Gosport. Lieutenant-Colonel E. M. Larminie, Commanding Royal Engineer, Gosport.

WELLS.—June 19.—For Building Small Block and Water-closet at Lunatic Asylum. Clerk of Works, Bath Lunatic Asylum, Wells.

WEST BROMWICH.—June 18.—For Laying Iron Pipes, Construction of Detritus Tanks, &c. Mr. J. T. Eayrs, Borough Engineer.

WEST HAM.—June 4.—For the Erection of New Wing to Hospital. The Secretary to Hospital Committee, Bufont Street, West Ham Lane, Stratford.

WEST THURROCK.—June 10.—For Erection of Additions to Board School at Purfleet. Mr. F. J. Sturdy, 44 Finsbury Pavement, E.C.

WEXFORD.—June 15.—For Building House for Light-keeper, Hook Tower Lighthouse. The Secretary, Irish Lights Offices, Dublin.

WORTHING.—June 4.—For Making, Erecting and Setting to Work of Three Gas-Engines. Mr. Jas. Mansergh, 5 Victoria Street, Westminster.

YEOVIL.—June 18.—For Building Board Schools. Mr. J. N. Johnston, Architect, 21 Princes Street, Yeovil.

YNYSHIR.—June 1.—For Building Chapel. Rev. E. O. Parry, Ynyshir, Porth.

TENDERS.

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S. Hill	1,125	0	0
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E. & P. O'Flynn	1,005	0	0
T. O'Flynn	993	0	0
D. Forde	993	0	0
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D. DUGGAN (accepted)	947	0	0

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J. Harrison, plumber.
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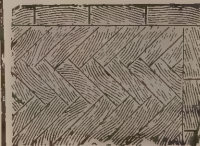
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T. Hartly, Easingwold, carpenter and joiner.
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J. Halliday, joiner.
J. Naylor & Son, plumber.
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For Building Classrooms, Cloakroom, &c., and Alterations to the Existing School at California, for the Ipswich School Board. Mr. T. W. COTMAN, Architect, Northgate Street, Ipswich.

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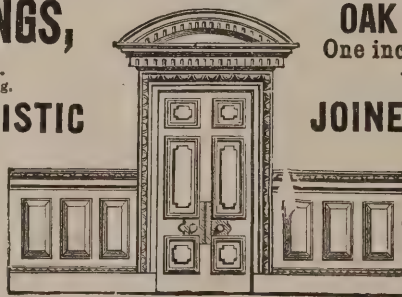
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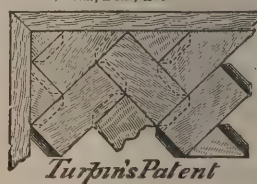
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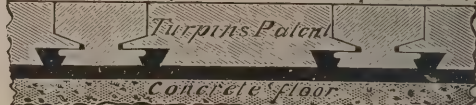
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R. & H. Harding	762	13	4
L. Whitehead & Co.	720	0	0
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G. E. Jeffries	695	3	3
A. Wallis	688	14	10
J. H. Newman	680	0	0
W. Wells	673	0	0

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H. G. DAVENALL, Southampton Works, Gospel Oak (accepted)	915	0	0

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T. White & Son, Bow	1,303	15	10
S. Polden, Uxbridge Road	1,098	0	0
Osmond Bros., South Kensington	1,087	0	0
E. Triggs, Clapham	999	0	0
C. J. Shaw, Lavender Hill	920	0	0
W. E. Caine & Son, Adelphi	848	9	0
E. Proctor, Woolwich	825	0	0
Peattie & Axtell, Gloucester Road	800	0	0
ERNEST MILLS, Westcombe Park (accepted)	785	0	0
W. E. Martin, Fulham (withdrawn)	650	0	0

For Construction of Public Conveniences, Southwark Park, for the County Council.

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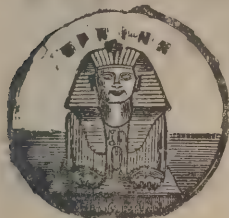
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E. Toms	£567	0	0
Gould & Brand	477	0	0
Olver	453	0	0
Sheffield Bros.	448	0	0
Edwards & Medway	304	10	0
		74	10
			379

* Exclusive of glass, gasfittings and pewtering.

For Alterations and Decorations to the Artichoke Tavern, Church Street, Camberwell, for Mr. Gallingham. Mr. ERNEST R. BARROW, A.R.I.B.A., Architect, 7 John Street, Adelphi, London, W.C.

Turtle & Appleton	£686	0	0
Bush & Sons	628	0	0
Drew & Cadman	594	0	0
HORTON (accepted)	585	10	6

"SPHINX" PORTLAND CEMENT.



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1½ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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"Model Dwelling," New-castle Exhibition, 1887.

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LONDON—continued.

For Drainage Works, New North Road, and Shaftesbury Street, Hoxton, for the Vestry of St. Leonard, Shoreditch. Mr. A. J. MARTIN, Surveyor.			
T. Adams, Wood Green	£1,259	0	0
D. H. Porter, Mansion House Chambers, E.C.	1,149	0	0
J. Jackson, Plaistow	1,117	0	0
Killingback, Camden Town	997	0	0
Surveyor's estimate	1,140	0	0

For Underground Convenience, Camberwell Green, for the Vestry of Camberwell. Mr. O. S. BROWN, Surveyor.			
Doulton & Co., Lambeth	£2,117	0	0
G. Jennings, Stangate	1,850	0	0
FINCH & Co., Lambeth (accepted)	1,827	0	0

MANSFIELD.

For Arching Over Portion of River Maun at the Corporation Depôt, Rock Valley. Mr. R. F. VALLANCE, Architect, Mansfield.			
J. F. Price	£446	15	0
H. Vickers	312	0	0
J. H. Vickers, Nottingham	297	5	0
J. D. Tomlinson	249	4	3
J. W. Fisher	214	0	0
W. A. Vallance	195	0	0
G. Frisby	178	0	0
H. Baker	160	0	0
H. ALSOP (accepted)	149	0	0

MARYPORT.

For Building Five Dwelling-houses for the Maryport Co-operative Industrial Society, Limited. Mr. C. EAGLESFIELD, Architect, Maryport.			
DIXON & NICHOLSON, Maryport (accepted).	£1,086	2	0
For Rebuilding Six Cottages, Nelson Street, Maryport, for Mr. J. A. Anderson. Mr. C. EAGLESFIELD, Architect, Maryport.			

Whittans & Son, mason.
J. Kendal, joiner.
T. Mandle, slater.
Hewetson & Southwell, plasterer.
J. Graham, plumber.
J. Wilson, painter and glazier.
Total, £451 13s.

NEWCASTLE-ON-TYNE.

For Building Police Station in Scotswood Road, for the Watch Committee. Messrs. MARSHALL & DICK, Architects, 4 Northumberland Street.			
C. W. King, Cheltenham	£5,600	0	0
G. H. Mauchlen, Newcastle	5,141	17	0
H. Brown & Co., Newcastle	5,111	0	0
J. & W. Lowry, Newcastle	5,079	0	0
J. C. Hope, Newcastle	4,835	15	6
Middlemiss Bros., Newcastle	4,777	0	0
J. Elliot, North Shields	4,586	0	0
T. Weatheritt, Newcastle	4,516	6	10
A. Bruce, Newcastle	4,514	0	0
J. LUNN, 8 Snowden Street *	4,400	4	8
Architect's estimate	4,800	0	0

* Recommended for acceptance.

PARKSTONE.

For Building House, &c., at Heatherlands Board School, for the Kinson School Board. Mr. SAML. J. NEWMAN, Architect, Ashley Road, Parkstone, Dorset.			
J. W. Lucas	£548	13	0
J. W. Street	532	15	0
R. Allner	468	0	0
T. Gulliver	445	0	0
E. B. Potts	439	0	0
Bath & Co.	437	0	0
G. Baker	436	0	0
Maddeford	427	0	0
Crabb & Sharp	420	0	0
W. J. Wallis	413	0	0
T. Cole	410	0	0
W. J. CHINCHEN, Bournemouth. (accepted).	400	0	0
For Shop and House, Heatherlands, for Mr. E. Godwin. Mr. S. J. NEWMAN, Architect.			
W. Pearcey	£875	0	0
W. J. Wallis	735	0	0
F. Maddeford	677	0	0
T. Gulliver	635	0	0
Crabb & Sharp	625	17	8
W. G. CRANE, Poole (accepted)	600	0	0
E. F. Allen (withdrawn)	520	0	0

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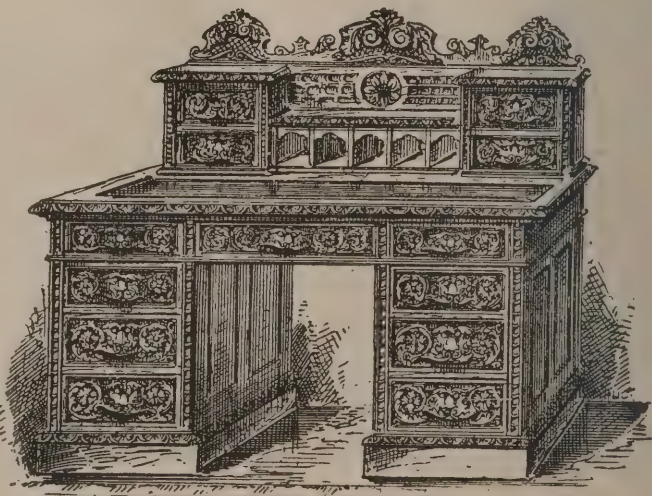
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For Restoration of Premises, No. 31 York Street, Plymouth.
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Street, Plymouth. Quantities by Architect.

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Matcham & Co.	£547	0	0
May	547	0	0
Palk	545	0	0
Roach & Lovell	495	0	0
Turpin	450	0	0
Coles	449	0	0
Blackell & Sheppherd	436	19	0
Palmer	435	6	0
Partridge	435	0	0
Andrews	400	0	0
Pearn	375	0	0
Panter & Davey	372	0	0
BLAKE (accepted)	365	0	0

PONTYPOOL.

For Building Club for the Pontypool Constitutional Club Com-
pany, Limited. Mr. D. J. LOUGHER, Architect, Bank
Chambers, Pontypool.

J. Morgan, Blaenavon	£1,930	0	0
A. H. Bailey, Pontnewynydd	1,698	0	0
Morgan & Evans, Pontnewynydd	1,627	0	0
W. Bowers & Co., Hereford	1,597	15	0
W. Jones & Sons, Newport	1,547	0	0
Hatherly & Carr, Bristol	1,487	0	0
W. Lessaman, jun., Chipping Campden	1,430	0	0
J. MINKS & Co., Newport (accepted)	1,394	0	0

PUDSEY.

For Building Residence at Pudsey. Mr. C. S. NELSON, Archi-
tect, Royal Insurance Buildings, 10 Park Row, Leeds.

Accepted Tenders.

W. Hutton, Fulneck, near Leeds, mason.
E. Hutton, Fulneck, near Leeds, joiner.
J. Scarth, Pudsey, plumber and glazier.
A. & S. Wheeler, Calverley, plasterer.
F. Thompson, Stanningley, slater.
J. Nicholson, Pudsey, painter.

RUGELEY.

For Supply and Delivery of Cast-iron Pipes, Special Castings,
&c., for New Waterworks, for the Rugeley Local Board.
Mr. W. H. RADFORD, Engineer, Angel Row, Nottingham.

Butterley Iron Co., Derby	£2,406	19	0
Cochrane & Co., Dudley	2,212	3	0
J. T. Salisbury, Burton-on-Trent	2,196	13	8
Staveley Coal & Iron Co., Chesterfield	2,180	7	6
Clay Cross Co., Chesterfield	2,164	4	5
Stanton Iron Co., Nottingham	2,137	7	5
WOODROFFE & Co., Rugeley (accepted)	2,137	0	0
J. Oakes & Co., London	2,120	4	0
J. & S. Roberts, West Bromwich	2,041	17	0

For Construction of Brick Service Reservoir, and Laying of
Iron Pipe Water Mains, &c., for New Waterworks, for
the Rugeley Local Board. Mr. W. H. RADFORD, Engineer,
Angel Row, Nottingham.

E. Tempest, Matlock Bridge	£5,476	19	0
J. Tomlinson, Derby	3,050	0	0
J. H. Vickers, Nottingham	2,917	0	9
H. Morecroft, Rugeley	2,825	0	0
D. H. Porter, London	2,750	0	0
Jones & Fitzmaurice, Birmingham	2,710	0	0
C. J. Nevitt, Stafford	2,633	13	6
R. Holmes & Sons, Chesterfield	2,555	0	0
W. Jenkins & Son, Leamington	2,523	0	0
H. SHARDLOW, Hyson Green (accepted)	2,421	0	0
J. Picthall & Son, Willesden	1,805	0	0

SHANDON.

For Improvements at Shandon Church. Mr. W. H. HILL,
Architect, Cork.

Dennis & Callaghan	£247	0	0
D. Duffan	220	0	0
J. LISK (accepted)	205	0	0

SILEBY.

For Construction of 12-inch Sewer and Works connected,
King Street and Swan Street, Sileby, for the Barrow-on-
Soar Rural Sanitary Authority. Mr. J. B. EVERARD,
Engineer.

S. & E. Bentley, Leicester	£368	1	0
J. Mason, Belgrave	317	18	7
R. Brant, Knighton	312	0	6
J. HOLME, Leicester (accepted)	264	8	1

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For Alterations and Additions to Red House, Chilworth Road, Chilworth, for Sir Harald G. Hewitt, Bart. Mr. STANSFIELD C. GREENWOOD, Architect, 11 Portland Street.
W. FRANKLIN (*accepted*) £752 0 0

SOUTHEND.

For Heating with Hot Water New Technical School and the Institute Buildings adjoining in Clarence Road, for the Corporation. Mr. W. Y. HOBBISS, Architect, Clarence Road, Southend.
W. Christmas, Southend £527 9 0
Crittall & Co., London 375 0 0
Beckett & Co., Chelmsford 349 10 0
W. G. Cannon, London 345 10 0
J. Gray, London 335 0 0
Strode & Co. 327 0 0
J. C. & J. S. Ellis, Sheffield 305 0 0
Kennell & Co., London 275 0 0
WOODHAMS & COOMBS, Southend (*accepted*) 231 0 0
W. J. Fox, London 219 15 0
Jones & Son, London 163 0 0
Bacon & Co., London 143 0 0

For Erection of Buildings adjoining the Southend Institute, Clarence Road, Southend, for the Corporation. Mr. W. Y. HOBBISS, Architect, Clarence Road, Southend.

T. B. Pilcher, London £3,355 11 8
Belham & Co., London 2,796 10 4
H. R. Rous, Grays 2,600 0 0
C. E. Skinner, Chatham 2,505 10 0
F. Dupont, Southend-on-Sea 2,468 0 0
C. J. Slade, Maidstone 2,426 0 0
Baker & Wiseman, Southend-on-Sea 2,163 0 0
F. E. WOODHAMS, Southend-on-Sea (*accepted*) 2,159 0 0

STOCKTON-ON-TEES.

For Mill Lane Infant Schools. Messrs. WEATHERILL & WHIPHAM, Architects, 59 High Street, Stockton-on-Tees.
Dickinson £4,303 0 0
Perks & Son 4,084 0 0
Davison 4,048 7 11
Craggs & Benson 4,035 10 0
Atkinson 3,805 8 4
Johnson & Hanley 3,755 3 0
COOKE (*accepted*) 3,687 4 8

STARCROSS.

For Reseating and other Works of Repair and Improvement of the Interior of the Parish Church, Starcross, Devon.
Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.
Hems & Sons, Exeter £995 0 0
W. Dart, Crediton 950 0 0
Luscombe & Son, Exeter 940 0 0
Goad & Co., Plymouth 875 0 0
Lamacraft, Dawlish 810 12 0
Page & Sons, Kennford 800 0 0
J. & L. Steer, Clyst St. George 793 0 0
Wakeham Bros., Plymouth 787 10 0
H. Read, Exeter 757 0 0
Rabbich & Brown, Paignton 726 0 0
Hamm & Passmore, Exeter 725 0 0
N. Pratt, Clyst St. Mary 719 0 0
Jas. Julian, Truro 654 10 0
Farr Bros., West Alvington 645 0 0
STEPHENS & SON, Exeter (*accepted*) 640 0 0
C. Brealy, Exeter 552 11 0

SUTTON.

For External Repairing and Painting of the Main Building of the Brighton Road School, Sutton, for the Managers of the South Metropolitan School District.
Wells, Benstead £3,967 0 0
Moss, Beckenham 3,220 0 0
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For Sinking of Well and Borehole at Wargrave for the Supply of Wargrave and Twyford with Water, for the Wokingham Rural Sanitary Authority.
Vivian's Boring and Exploration Co. £1,312 15 0
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S. F. Baker & Son, Southwark 581 0 0
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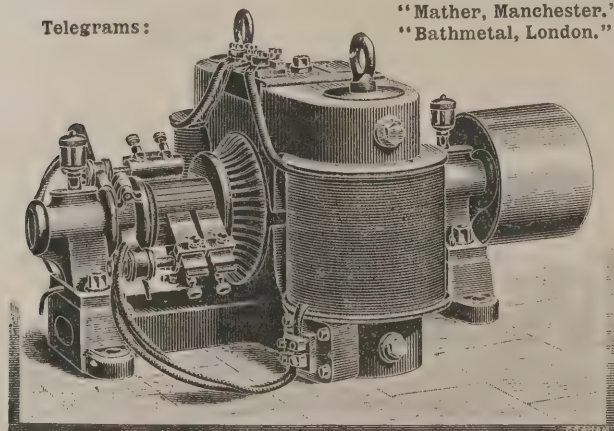
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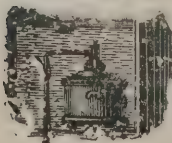
PATENT CISTERN FILTERS, Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. Vide Professor Frankland's Reports to the Registrar-General, July 1866, November 1867 and May 1870. The *Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1866, and December 1872.

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Haverstock Road, for the Guardians of Bedminster
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Three Streets.

T. Lucas, Totterdown	£816	3	0
C. Bradshaw & Son, St. Philip's	816	1	5
M. Durnford, Totterdown	809	7	7
T. J. Beaven, Bristol	787	3	6
W. T. & T. R. Mereweather, Bedminster	749	0	0
J. Perkins, Redland	692	0	0
W. Hickery, Upper Knowle	686	6	0
J. Durnford & Son, Bedminster	666	17	6
W. HURFORD, Totterdown (accepted)	632	13	0

Haverstock Road.

Aaron & Rendall, Bristol	328	2	0
T. J. Beaven	236	9	0
C. Bradshaw & Son	223	14	1
W. T. & T. R. Mereweather	211	0	0
M. Durnford	207	7	10
T. Lucas	199	9	3
J. Perkins	196	0	0
J. Durnford & Son	190	18	10
W. Hickery	181	5	2
W. HURFORD (accepted)	172	7	9

TRADE NOTES.

THE new Board Schools, Dartford, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE building committee of the large new technical school now being erected at Birmingham, having carefully considered various improved schemes placed before them, recently selected the "Baird-Thompson" scheme and system, owing to its simplicity, efficiency and moderate cost. This system is a combination of automatic and mechanical ventilation, and while positive in its action, maintains a uniform temperature and creates no draughts. Messrs. Baird, Thompson & Co. have issued from their London office, at 159 Queen Victoria Street, a new illustrated catalogue describing their system.

WE have received from Messrs. J. & H. Patteson their new circular containing a list of important works lately executed by them in marble and mosaic. In addition to their Italian marble and ceramic mosaic pavements, at the show-rooms may be seen a very large stock of chimney-pieces of latest designs. All descriptions of work in marble, granite and stone, in fact, are carried out by them, as well as statuary, monumental work, fonts, pulpits, reredoses, artistic pottery, pedestals in marble, granite and mosaic, &c.

THE tender of Messrs. J. D. Young & Son, of the Iron Foundry, Barnstaple, has been accepted for providing the ornamental railing which is to be erected as the boundary between the North Devon Athenæum Garden and road, at the entrance of the Taw Vale Parade, Barnstaple.

THE Mersey Docks and Harbour Board have approved a recommendation of the works committee to reconstruct that portion of the shed recently destroyed by fire on the east quay of the Prince's Dock, at an estimated cost of 2,660*l.*

THE Rhyl Improvement Commissioners have agreed with the contractor (Mr. Law, of Kidderminster) to make the Rhyl Marine Lake with 24 acres of water surface, instead of 18 acres as before intended. The total cost of the work will be 8,000*l.*, but only one-half has been let in this contract, which provides that the embankment and inlets and outlets shall be ready to impound the water by July 6.

MR. E. CURTICE (Romeike & Curtice's Press-cutting Agency) has brought out a newspaper index which will be extremely useful to the public. "Curtice's Index" applies to the *Times* and the other London and evening papers, 120 weeklies and thirty-one provincial papers. The volume which has just appeared covers the period between July 1 and September 30, 1893. The first pages of this volume explain it fully and clearly. Turn up the index, and you will find the newspaper, date and column in which the particular matter in which you are interested has appeared. The index extends to 267 quarto pages.

THE following letter, dated May 21, 1894, from Mr. D. Rodrigues, a well-known diamond merchant of Hatton Garden, has been received by Milner's Safe Company, of Finsbury Pavement:—"I am more than delighted to inform you that the strong safe which I purchased from you six weeks ago has withstood the most determined attempts to open it. Burglars entered my premises between Friday evening last and Monday morning, and there is evidence of their having been at work upon the safe for upwards of thirty hours. They have made

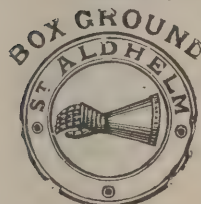
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holes in the floor for the purpose of fixing a drilling machine, with which strenuous efforts have been made to open the door, but they have proved utterly futile, the safe remaining intact. They have also failed to open a smaller safe, which I purchased of you twelve years ago."

THE *York Herald* says:—Since the separation of the two towns of Malton and Norton, the question of the great cost of the old steam pumping-engine at the waterworks has become a most serious one for the Board of Health and the town. Norton went in for a new water-supply of its own, and put down a new gas pumping-engine and appliances. Mr. Henry Tobey, manager of the Malton Gasworks, says:—"The cost of gas at Norton for the whole twelve months has only amounted to 38*l.* 18*s.* 6*d.*, and for the engine-man 31*l.* The latter item might have been reduced to about 15*l.*, as it is not necessary to give assistant attention to the engine. The cost of coals for Malton during the same twelve months has amounted to 256*l.* 1*s.* 6*d.*, and engine-man, repairs, oil, waste, rent, boiler insurance, &c., 273*l.* 15*s.* 6*d.*—a total of 529*l.* 17*s.* 1*d.*" The surveyor to the Uxbridge Local Board recently reported to the committee that whereas formerly the steam-engine and the pumps working fourteen hours per day cost 555*l.* per annum, the expense of running the gas-engine and pumps working seventeen hours per day only amounted to 374*l.* per annum. The gas company have offered the Malton Board to put down a gas-engine and efficient set of pumps for 475*l.*

BUILDING AND BUILDERS.

THE Tottenham School Board have commenced another large school near the Alexandra Palace, in the Bounds Green Road. The contract has been let to Mr. Charles Wall, of Chelsea, at 14,800*l.* (who is just completing two other large schools for the same Board), and the plans have been prepared by Mr. E. H. Lingen Barker, architect, of London, Hereford, and Swansea.

WE understand, the *Tablet* says, that it has been definitely decided to begin the building of the Westminster Cathedral, if not immediately, at least in the near future. The new cathedral is to be upon a scale in every way worthy of its purpose, and on the magnificent site which was secured some years ago, opposite Archbishop's House.

A SITE on the Great Orme's Road, West Llandudno, has been selected as a gift to the Rev. John Morgan, rector, on which to build a new church.

VARIETIES.

AN inquiry has been held into an application by the Atherstone Rural Sanitary Authority for permission to contract a loan of 11,412*l.* for works of water supply for Baddesley, Emor, Baxterley, Bentley and Merivale.

AT the Bradford Town Hall an inquiry was held in reference to the application of the County Council for power to borrow 125,313*l.* for sewage works, including the diversion of the Bradford Beck, the erection of a refuse-destroyer on a site near Stanley Road, the construction of railway sidings, &c., and a sum of 3,288*l.* for the extension of Cliffe Lane to between Bolton and Otley Roads.

THE Victoria Bridge Board, Brisbane, have accepted the tender of Mr. John M'Cormick for the construction of the piers and superstructure of the new bridge. The amount of the tender is 92,952*l.*, and that of Mr. A. Midson, for abutments and approaches, 16,373*l.*

AT a general meeting of the Mason College Engineering Society, held in Mason College, Birmingham, a paper on "Ironmongery" was read by Mr. John Ashford. The methods of moulding with green sand and dry sand were explained, and the various foundry sands and their preparation described. The relative advantages of mixing sands in the pug-mill and by the Schultz-mixer were discussed. Stereo and plate patterns for repeat castings were shown and their use fully illustrated, the author concluding with a description of the Lieder moulding machine, a working model of which was shown.

THE mansion-house of Ellary, on the shores of Lochkilleshport, twelve miles from Ardrishaig, has been destroyed by fire, the damage amounting to about 10,000*l.*

ROOKERY MILLS, Huddersfield, have been destroyed by fire, as also a cottage and a public-house on the opposite side of the road. The damage is estimated at 40,000*l.*

THE Runcorn Improvement Commissioners have purchased the undertaking of the Runcorn, Weston and Halton Waterworks Company for 67,500*l.*

THE death is announced of Mr. John Clark, senior partner of the firm of Messrs. Clark & Co., thread manufacturers, at his town residence, Gateside, after a prolonged illness. The deceased, who was over sixty years of age, gave to Largs, of which he was several times provost, a United Presbyterian church and hospital, and was one of the originators of the Paisley Convalescent Homes at West Kilbride.

DAMAGE to the amount of 5,000*l.* was caused by fire in the west wing of Denstone College, near Alton Towers.

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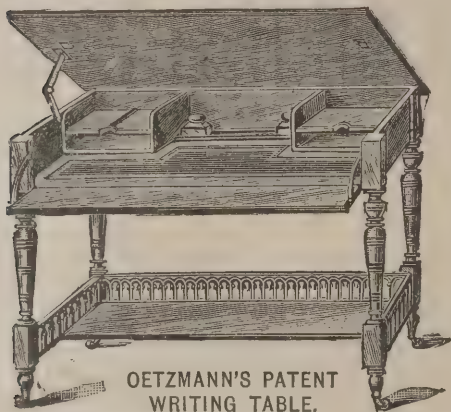
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THE collection of portraits exhibited at Mr. Ichenhäuser's Gallery in New Bond Street contains about fifty masterpieces, which are worth seeing. There is also an interesting assemblage of old furniture.

THE steeple of the Shurdington parish church, near Cheltenham, has been struck by lightning during a heavy thunderstorm which passed over the district. The tower is cracked and the roof damaged.

ELECTRICAL.

THE United Methodist Free Church in Adelaide Street, Blackpool, has just been enlarged by the addition of galleries, &c., so as to accommodate 200 additional worshippers. The electric light is installed, representing 1,758 candle-power.

AN electrical exhibition has been held at the Municipal Buildings, Dover, in connection with the introduction of the light into Dover. The exhibition was attended by large numbers of people from towns in Kent. A novel experiment of a concert from London was made with the telephone under arrangements with the National Telephone Company, the London music-halls, &c., being connected with the hall. A special room was set apart for the purpose.

At the meeting of the Society of Engineers on Monday, the 4th inst., a paper will be read on "Power Distribution by Electricity, Water and Gas," by Mr. Ed. C. de Segundo.

At the meeting of the Worcester watch committee it was resolved to recommend the Council to fix the charge for the private supply of electricity at 5d. per unit, which is equivalent to 2s. 6d. per 1,000 feet for gas. The proposal for suspending arc-lamps over the roadways was abandoned, and the Brush Company were requested to submit designs with prices of brackets for fixing lamps on houses in the streets.

FOUR mills in Flash Street, Bolton, belonging to Messrs. Ormerod, Hardcastle & Co., Limited, are about to be fitted with a complete installation of the electric light. The plant consists of one large dynamo capable of lighting 1,300 lamps and taking about 120 horse-power, obtained from one of the mill engines, and in addition there is a small pilot dynamo of 100 lamps capacity, arranged to run off the same shaft or from a small auxiliary engine, as required. The contract for the work has been let to Messrs. Bennett & Duce, of Preston, and the design and arrangement of plant have been carried out by Messrs. Shepherd & Watney, consulting engineers, Leeds.

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VILLA RESIDENCES TO BE ERECTED NEAR SWANSEA.

TOWERDENE, BRISTOL.—DRAWING-ROOM.

NOTES ON NOVELTIES.

Greenhouses on Wheels.—Agriculturists generally, and horticulturists in particular, whether amateur or professional, will be glad to hear of an important innovation which is being introduced by the Horticultural Travelling Structures Company. The novelty of the idea consists in the greenhouses, or plant-protectors, being provided with wheels constructed to run on a permanent or temporary rail-track, by which means the same structure will perform the work which would by the old system require a series of such shelters, thereby effecting an enormous saving in original cost and ultimate maintenance. For instance, a house which under ordinary circumstances would have lain idle during a large portion of the year will, by using one of the structures referred to, be in constant use for protecting and cultivating crops, and in the case of growers who, by the pressure of competition, have been forced to a constant use of their houses, instead of having to carry in batches of plants from the open air there will be a vast saving of time and labour by simply moving the whole structure, as supplied by the company, bodily over the plants as they stand. A great saving of labour in watering is likewise effected, as the houses run so lightly that one of, say, 15 feet by 12 feet, can be instantaneously moved by one man, so that advantage can be taken of even a passing shower. Ground, moreover, undergoing cultivation by the aid of one of these structures is periodically exposed to the action of sun, air, rain and frost, which are most destructive to the parasitic fungi, bacteria and even insect pests, which thrive in the close and moist conditions of the ordinary fixed structures. The hot-water apparatus moves with the structure, and thereby saves the cost of extra piping and boilers; and among the many other advantages claimed by the company for their patents, two may be cited which will be readily appreciated by all classes, *i.e.* that being movable no doubt can arise that they are tenant's fixtures, and consequently they do not entail increased assessment for rates and taxes.

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THE MANCHESTER SHIP CANAL.

IN connection with the loan of 5,000,000*l.* from the Corporation of Manchester to the Ship Canal Company, a lengthy report by the corporation engineer, Mr. Hill, dated April 12, 1894, has appeared. When Parliament authorised the loan of the last two millions of the five millions it was to meet a cost of remaining works and equipment (as estimated in June 1892) of 2,183,483*l.*, and the actual outlay to the end of last year was 1,902,440*l.*, but the outlay still needed is set down at 277,839*l.* Mr. Hill's report states, further on, that the estimate of June 1892 "did not contemplate or provide for many important works or for equipment which might in the future be necessary, and to which attention up to the time had never been directed, or for compliance with Parliamentary obligations not immediate. So far as the work was contemplated under the June estimate of 1892, this has been done within the estimate." He goes on to say:—"By the half-yearly statement prepared by the canal company as from January 1, 1894, the capital powers and other assets available amounted to the sum of 1,059,108*l.* This was the whole balance left of the 5,000,000*l.*, and takes credit for 73,081*l.* as then available from shares in the hands of the company. It also includes a sum of 66,287*l.*, which is deposited under the terms of the London and North-Western Railway Company's arbitration, which cannot be taken into account. Deducting these two sums, the balance is reduced to 919,740*l.* This sum of 919,740*l.*, plus 60,000*l.* which may be available from balances on former estimates when the contracts are settled up—together 979,740*l.*—is the total balance left to meet future expenditure as from January 1, 1894. This sum is exclusive of 384,448*l.*, the accumulated revenue account of the Bridgewater undertaking up to the end of 1893, as shown in the company's balance-sheet."

On February 9 last the traffic committee recommended prompt efforts by the executive committee to provide works for which, though no drawings or information were available for a definite estimate, Mr. Hill was of opinion that 1,000,000*l.* might be needed. The executive committee requested that the matter might be reconsidered, with the result that the traffic committee drew up an amended list of works which they considered (February 16) "most urgently required and absolutely essential for traffic now being negotiated for and in course of development." These were estimated by the engineers to cost 443,000*l.* Deducting 184,000*l.* for requirements that did not belong to equipment, the real sum for equipment was 259,000*l.* One of the items included in the 184,000*l.*—viz. 73,000*l.*—was,

however, neither construction nor equipment, but was for further dredging in the removal of silt, mainly in the tidal part of the canal. As the canal for the portions referred has been once excavated to its full depth and width, Mr. Hill observes that the Corporation have not the power to devote any of their loan to its maintenance, and this remark will apply to all parts of the canal under the same conditions.

The estimated expenditure, less resources, as from June 1, 1892, was 1,499,282*l.* After provision has been made to complete these works, and including 95,201*l.* for works which have arisen since June 1892, a balance of 401,624*l.* remains, to which may be added the amount realised for plant. The work contemplated under the June estimate of 1892 was practically completed for about 1½ million over the loan unexpended, but, including the works which have arisen during the progress, and additional equipment provided for the opening, this half million has been reduced to 401,624*l.*

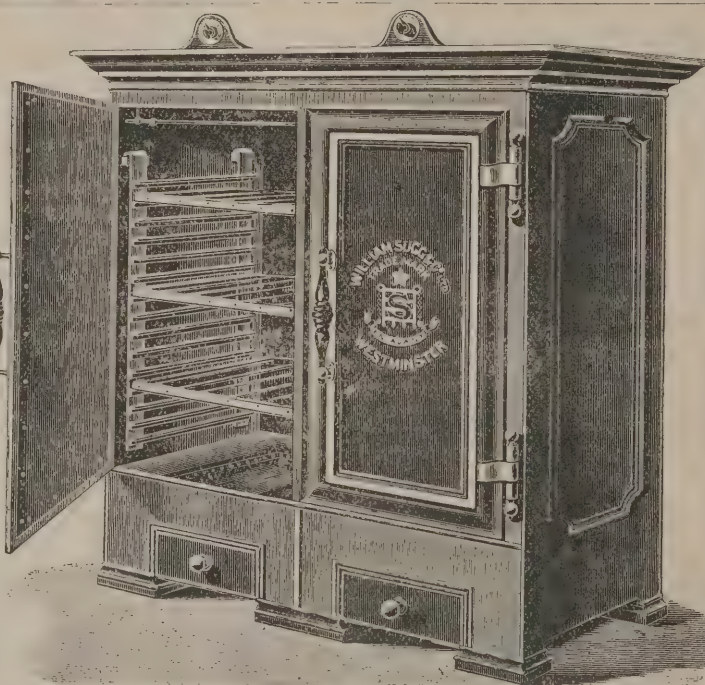
NEW FIRE STATIONS IN LONDON.

At the meeting of the London County Council on Tuesday the important subject of providing additional protection from fire in the Metropolis came up for consideration. In February last the fire brigade committee drew up a long report on the provision of additional protection from fire in London. The report came before the Council on March 6, and, in accordance with the resolution then adopted, the committee now presented a further report showing what part of the scheme they considered should be carried out during the present financial year, and what charge in respect of capital and maintenance would be thereby entailed. Of the four fire-engine stations which they recommended should be established, the committee were of opinion that, provided a suitable site could be obtained, the one at Streatham should be proceeded with, and that sites should, if possible, be acquired this year at Perry Vale and Shepherd's Bush, but that building should not commence till next year. Out of the twenty-four proposed additional sub-stations they recommended that ten should be put in hand, viz. North End Road, Fulham; High Road, Kilburn; Strand (near the Law Courts); Piccadilly Circus; High Street, Homerton; Burdett Road, Limehouse; North Woolwich; Lee Green; Battersea. Park Road; Brixton Hill. Of the fifteen proposed additional hose-carts and fire-escape stations they recommended the commencement of duty this year at Hornsey Rise; Aubert Park, Islington; St. Leonard's Row, Poplar, and Rye Lane, Peckham. Of

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the five proposed additional hose-cart stations, they thought three should be dealt with, viz. York Road, Camden Road; Mile End Road, and Anerley Road, Penge. Of the fifty proposed they recommended the establishment this year of sixteen additional fire-escape stations in the following localities:—Wandsworth Bridge Road; Fulham Palace Road; Blythe Road, Hammersmith; Alpha Road, Regent's Park; Haverstock Hill; Mill Lane, Hampstead; Malden Road, Kentish Town; Victoria Park Road; Bow Common Lane; Beresford Square, Woolwich; Burnt Ash Road, Lea; Mayow Road, Forest Hill; Lower Streatham; Loughborough Junction; Balham Hill; and East Hill, Wandsworth; and of the ten proposed additional steam fire engines they were of opinion that five should be purchased and stationed at the Notting Hill, St. John's Wood, Bethnal Green, Isle of Dogs and West Norwood stations. They also submitted a rough estimate of the expense which the adoption of their recommendations would this year involve, amounting to about 6,000*l*.

Lord Carrington, the chairman of the committee, in moving the reception of the report, explained that, in addition to spending 100,000*l*. capital expenditure on land, buildings and plant during the next five years, the annual expenditure for maintenance, including the wages of the additional staff that would be required, would gradually increase until the brigade cost the ratepayers 30,000*l*. The loan of 100,000*l*. was to be repaid in fifty-five years. Having stated the proposals of the committee as set out in the report, his lordship concluded by remarking that they were only what were absolutely necessary for the protection from fire of this great Metropolis.

Mr. Saunders, M.P., moved as an amendment that the fire brigade committee be requested to report to the Council as to the cost of providing and using the injector hydrants where high-pressure mains were already laid down; also as to the amount of pressure which would thus be obtainable in the event of a great fire in the locality where such hydrants were provided, and whether the use of such hydrants had been of advantage at Hull, and what had been the effect of the introduction of high-pressure water on the prevention and extinction of fire in Manchester.

Colonel Howard Vincent, M.P., thought the scheme of the committee was the least they could undertake in justice to the vastly increasing population of the Metropolis and the enormous property under the control of the Council.

The recommendations of the committee were agreed to.

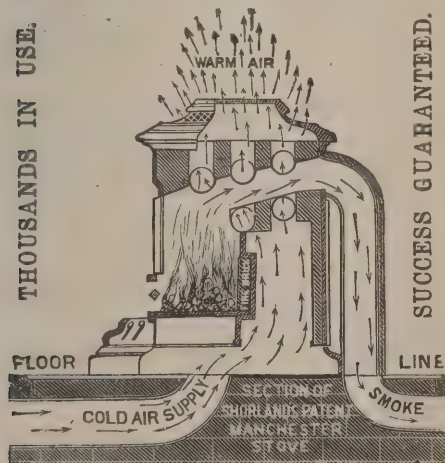
EARLY HISTORY OF GAS-LIGHTING.

THE existence and inflammability of coal gas have been known for more than two centuries. In 1659 Thomas Shirley attributed the exhalations from the burning well of Wigan, in Lancashire, to the coal-beds which lie under that part of the county. Soon after Dr. Clayton, influenced by the reasoning of Shirley, actually made coal gas, and detailed the results of his labours in a letter to the Hon. Robert Boyle, who died in the year 1691. He says he distilled coal in a retort, and that the products were phlegm, black oil, and a spirit which he was unable to condense, but which he confined in a bladder. These are precisely what we now find, but under different names; the phlegm is water, the black oil is coal tar, and the spirit is gas. Clayton several times repeated the experiment, and frequently amused his friends with burning the gas as it came from the bladder through holes made in it with a pin. This was a hint which, in an age more alive to economic improvement, might have brought gas-lighting into operation a century earlier, though the mechanical difficulties might have been too great to overcome at that period—a circumstance which has retarded the introduction of many valuable discoveries, as it did that of the steam-boat and the printing-machine.

In the year 1733 Sir James Lowther communicated to the Royal Society a curious notice of a spontaneous evolution of gas at a colliery belonging to him near Whitehaven. While his men were at work they were surprised by a rush of air, which caught fire at the approach of a candle, and burned with a flame two yards high and one yard in diameter; they were much frightened, but put the flame out by flapping it with their hats, and then all ran away. The steward of the works hearing this went down himself, lighted the air again, which had now increased, and had some difficulty in extinguishing it. It was found to annoy the workmen so much that a tube was made to carry it off. The tube projected four yards above the pit, and at the extremity of it the gas rushed out with much force. "The gas being fired," says the account, "it has now been burning two years and nine months, without any sign of decrease." Large bladders were filled in a few seconds from the end of the tube, and carried away by persons who fitted little pipes and burned the gas at their own convenience. We do not learn what became of this copious supply; it probably diminished as the coal-bed was exhausted.

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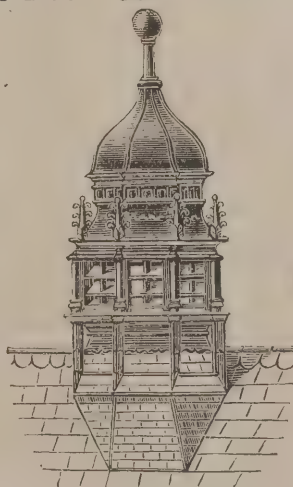


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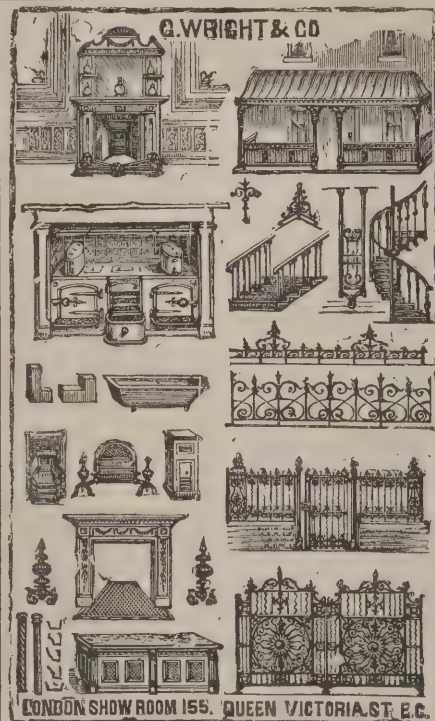
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Soon after the middle of the last century, Bishop Watson made many experiments on coal gas, which he details in his "Chemical Essays." He distilled the coal, passed the gas through water, conveyed it through pipes from one place to another, and did so much that we are only surprised he did not introduce it into general use.

But although the properties of coal gas were known to so many persons, no one thought of applying it to a useful object until the year 1792, when Murdoch, an engineer residing at Redruth in Cornwall, erected a little gasometer and apparatus, which produced gas enough to light his own house and offices. Murdoch appears to have had no imitators, but he was not discouraged, and in 1797 he erected a similar apparatus in Ayrshire, where he then resided. In the following year he was engaged to put up a gas-work at the manufactory of Boulton & Watt, at Soho. This was the first application of gas in the large way; but, excepting in manufactories or among scientific men, it excited little attention until the year 1802, when the front of the great Soho manufactory was brilliantly illuminated with it on the occasion of the public rejoicings at the peace. Accustomed as we are to the common use of gas, we cannot even now but be struck with such a display on a large scale; but the superiority of the new light over the dingy oil lamps used at that day, when thus brought into public view, produced an astonishing effect. All Birmingham poured forth to view the spectacle, and strangers carried to every part of the country an account of what they had seen. It was spread about everywhere by the newspapers, easy modes of making gas were described, and coal was distilled in tobacco-pipes at the fire-side all over the kingdom. Soon after this several manufacturers, whose works required light and heat, adopted the use of gas; a button manufactory at Birmingham used it largely for soldering; Halifax, Manchester and other towns followed. A single cotton-mill in Manchester used above 900 burners, and had several miles of pipe laid down to supply them; the quantity made averaged 1,250 cubic feet per hour, producing a light equal to that of 2,500 candles. Murdoch, who erected the apparatus used in this mill, sent a detailed account of his operations to the Royal Society in 1808, for which he received their gold medal.

But although the use of gas was thus spreading in the manufacturing towns, it made little progress in London. This may be accounted for in some measure by the circumstance that no means had as yet been found out for purifying it. It was dirty, it had a disagreeable smell, and it caused headache

when used in close rooms, besides spoiling delicate furniture. This was of little consequence in a manufactory, where there is generally ventilation enough to carry off unpleasant vapours, and rarely very delicate organs or fine furniture to suffer from their influence. But these defects were fatal to its general introduction in London, and until they could be removed there was small hope of success, though attempts were made, lectures delivered, and a number of interesting experiments made by a German named Winsor, whose perseverance and sanguine temper were very efficient in making the matter known to the public. But Winsor was deficient in chemical knowledge and mechanical skill, while he largely overrated the powers of the new instrument which he was zealously endeavouring to introduce. He took out a patent in 1804 and issued a flaming prospectus of a National Light and Heat Company, promising to subscribers of 5% a fortune of at least 570% per annum, with a prospect of ten times as much. A subscription was soon raised, it is said, of 50,000%, which was all expended in experiments without profit to the subscribers. Winsor, however, gained experience, and is said, we know not how truly, to have introduced the important measure of purifying gas by lime. In 1807 he lighted up Pall Mall, which continued for some years to be the only street in London in which gas was used. In 1809 the National Light and Heat Company applied to Parliament for a charter, but they were opposed by Murdoch on the score of prior discovery, and the charter was refused. It was, however, granted on a subsequent application, and the operations of the company became more extensive. But their profits had not yet begun, and increase of business was only increase of expense. The subscribers began to be alarmed at the exhaustion of their funds, and called loudly for a change in the management of their affairs. This was conceded, and the superintendence of their works was entrusted to Mr. Clegg, who had been for some years engaged in the erection of gas apparatus in Birmingham. Affairs now began to wear a better face; other parts of London applied for light, and new stations were erected. The business of the company steadily increased, and in the year 1823, in the course of a parliamentary investigation, it was shown that this company alone consumed annually 20,678 chaldrons of coals, which produced on an average 680,000 cubic feet of gas every night; this was distributed by means of 122 miles of pipe, which supplied more than 30,000 burners, giving a light equal to as many pounds of tallow candles. The other companies then established made altogether about the same quantity.

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R. H., London, September, 1893."

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SAND IN MORTAR.

It was probably noticed at an early time that pure lime mortar, if used as a stucco without a sufficiency of sand to prevent shrinkage, failed through the cracks and fissures which took place in it, and then the step was easy to the persuasion that, under all circumstances, sand should be used with mortar to make strong work.

When once this conclusion was accepted no attempt was made to verify its accuracy, and the whole attention of those interested in building was turned to the discovery of the way in which the assumed fact might be accounted for. As, however, this had no existence, it is scarcely matter for astonishment that there should be wide differences in the proportion of sand supposed by different writers to be the best—that there should be little agreement in their modes of accounting for the supposed increase of resistance due to its action, and that, finally, it should be left to the workman to do pretty much as he pleased in compounding his mortars.

Vitruvius states that "when the lime is slaked, it is necessary to mix three parts of sand, if the sand is fossil" (by which term he means pit), "with one part of lime; and if the sand is river sand, to add two parts of it to one of lime." "Such," he says, "are the proportions best suited for making mortar," and he endeavours to account for the fact of this mixture hardening in the following manner:—"The weight of the lime, after calcination, is diminished about one-third by the evaporation of the watery parts; from this it results that the pores, being empty, are better fitted than before to receive the admixture of sand, and to unite strongly with the blocks of stone to form solid masonry."

Perrault endeavours to prove Vitruvius was correct, and that his explanation coincided with that of the chemists of his time. These believed that the limestone having lost, by the action of the fire, all the volatile parts, which were the cause of its hardness, is left full of empty pores, formed by an extremely dry and arid matter, which absorbs with avidity the humid portions of the atmosphere; but as these cannot restore to it the components which it loses by calcination they reduce it to an impalpable powder, and it is this avidity of the lime which produces its causticity. When this property acts on the sand and on the stones it brings out of them, with time, a part of the sulphurous and volatile salts which they contain, and produces between them so strong an adhesion as to form a solid and hard body. They thought, further, that the sand loses a por-

tion of its hardness, and that the lime profits by this loss, and thus a mutual disposition to unite strongly is developed; consequently, when an attempt is made, after some time, to separate the stones of masonry built with good mortar, the mortar is observed to adhere with great force to their surfaces.

It is evident that so far no sufficient reason has been given for the supposed effect of sand. Its beneficial action being assumed, fanciful theories are sought in explanation of it.

Macquer says that the cause of the action of mortar may be deduced naturally from the properties of the lime, and it is especially owing to the fine division of its particles when it has been slaked. This extreme state of division, which reduces the particles almost entirely to surfaces, enables them to attach themselves very closely to the superficies of the sand or the cement (calciné clay, puzzuolana, &c.), and to adhere with a force proportional to the accuracy and intimacy of contact. With reference to the question why paste of lime without sand does not reach the consistency and hardness of mortar (for he, like his predecessors, takes the beneficial action of sand for granted), Macquer supposes that generally the particles of slaked lime adhere more closely to hard bodies than to each other on account of the great quantity of water united to them, which prevents their coming so closely into contact as they do with sand or cement, for these substances, by absorbing a portion of the water of the slaked lime, facilitate the drying and adhesion. Though this reasoning is on the whole perhaps better than that of previous writers on the subject, the questions of adhesion and cohesion being considered and arguments worth weighing at least brought forward in support of the superiority of the former, it is hardly necessary to say that silicious sand cannot absorb a perceptible quantity of water.

Belidor prescribes two or one and a half measures of sand to one measure of lime paste; or, if the lime be very fat, three measures of sand to one of lime paste; this amounts to one or three-quarters sand to one measure of slaked lime in powder for ordinary cases, or one and a half sand to one part of lime powder, if the lime is very fat.

Rondelet, after carefully considering the theories of preceding authors, determines that no precise rule can be laid down for the proper proportion of lime and sand, and appears to have arrived at pretty much the same conclusion as Belidor. He says "that there is quicklime, such as that of Melun, which absorbs, in slaking, two and a half times its weight of water, to form a paste moderately fluid, such as is required for ordinary mortar, without being obliged to add more water. There

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may be found other lime which, in order to form a paste of equal consistency, consumes only a quantity of water equal to its own weight. It has been found, from numerous experiments, that in order to make good mortar with the first of these pastes it is necessary to mix three parts of river sand with one and a half parts of lime" (or equal parts of sand and lime if the lime is measured in powder), "and in making use of the second paste, two parts are necessary for three parts of the same sand. These two mortars, when equally well mixed, acquire, with time, the same consistence." "It is necessary to observe," he continues, "that in the first mortar the quantity of lime in paste is half the sand, and in the second two-thirds; however, since Vitruvius all who have written on the art of building have repeated that, in order to make good mortar, it is sufficient to mix one part of slaked lime with two parts of river sand, but it is requisite to suppose a lime of superior quality to that of Melun, which, however, is considered very good. As to the quantity of quicklime in these two mortars, I found that in the first it is only one-seventh of the sand, whilst in the second it is one-third of it. It is this last proportion which M. De la Faye prescribes. In order, in all cases, to make a proper mixture a certain amount of experience is required to judge of the degree of consistence which well slaked lime and mortar sufficiently mixed should have. It is this degree which determines the quantity of water for slaking the lime and the quantity of sand necessary to make good mortar.

Rondelet here takes up new grounds. Assuming, like his predecessors, that sand acts beneficially on mortars, he considers that they were wrong in prescribing the same dose of it for all limes without regard to quality, and that the object to be attained is a compound which will have that degree of plasticity which a skilful workman finds to suit him best. He goes on to say, indeed:—"In all the parts of France and Italy through which I have travelled I have questioned those workmen who appeared most intelligent. I have found that their knowledge reduces itself to a practical knowledge which usage and experience render sufficiently sure. . . . A workman who, by a long experience, is accustomed to judge if the mortar is fat enough, enough worked, and if it has the consistence it ought to have, is rarely deceived; he beats and mixes the different ingredients of which it is composed until he has hit off the point he aims at," which, in these days at least, is that point which will give the least trouble.

Dr. Bry Higgins, who wrote twenty years before Rondelet,

prescribes that no more than one part of lime to seven of coarse sand ought to be used in mortar to dry quickly, and less lime may not be used, because it does not render the mass sufficiently plastic for building or incrustation. He subsequently states that this is the best proportion, whether the mortar is to be quickly dried or not. Dr. Higgins measured his ingredients by weight, and according to Smeaton's calculation Thames sand weighs four and a half times as heavy as the slaked powder of common lime; the above proportion therefore is somewhat under one and a half parts sand to one of lime in slaked powder, or three parts sand to one of lime measured in paste.

The discrepancy between Higgins's statement and Rondelet's as to the amount of sand which gives the best consistence for working is to be accounted for in this way:—Dr. Higgins, though concluding the above proportions to be the best for building purposes generally, arrived at them by experiments made with reference to stuccoing, for which purpose freedom from shrinkage is a more valuable property than freedom in working. He decided, in fact, on the most plastic composition which did not crack in drying.

Smeaton, whose opinions perhaps will carry more weight than those of any of the writers quoted, says:—"The use of sand in mortar, so far as I have been able to observe, is twofold—first, to render the composition harder, and, secondly, to increase it in quantity by a material that in most situations is of far less expense, bulk for bulk, than lime. As there is no apparent change in the sand by the admixture of the lime, the sand seems only to render the composition harder by being a harder body; for the best sand, being small fragments of flint, crystal, quartz, &c., is much harder than any body we know of that can be formed of lime only, and which, in paste, is to be considered as a cement to the harder materials, and therefore composes a harder body; for the same reason that, if we had nothing naturally but lime as a cement, and should build a wall with flints, crystals, or rough stones cemented therewith, this wall would be far harder than if built with lime alone."

Smeaton did not, however, apparently arrive at this conclusion from comparative experiments on resistance of different mixtures, for in the next paragraph he continues:—"The experience of ages has shown that a considerable quantity of sand and other matter may be introduced with advantage in the making of mortar, but the proportion has never been agreed in; yet from common experience it appears that there

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is scarcely any lime but what, if well burnt and beaten, a load or measure of lime will take two loads or measures of sand—that is, the quantity of sand that can be introduced into its composition may equal the lime in powder. . . . Finding this idea so far to answer not only in experiment, but my expectations satisfied in works at large, I was induced to try whether lime would not bear a still greater addition of sand, and I soon found that it would, with good beating, take in for every two measures of slaked lime one measure of tarras and three of clean sand. . . . Still pursuing the same line of experiment to see how far this matter could be carried, it appeared that even yet a greater proportion of sand could be introduced, but to bring it to a proper consistency and toughness, so as to be a good cement to large stones, I found it needed so much more beating that the labour became in most cases of more value than the saving of the materials." The proportion last employed, he adds, in a footnote, agrees, allowing for the tarras, with the greatest mixture of sand and lime of Dr. Higgins, which was scarcely two of sand to one of lime powder.

In the same note Smeaton states, "I have long since found the necessity of forming a composition of fine and coarse sand for mortar, unless the sand is naturally so mixed, for as the lime will receive the most sand in that way, without losing its plasticity, it will of consequence make the hardest and firmest mortar."

In concluding that those mortars must of necessity be the best which have as much sand as they can carry without losing the toughness and plasticity which the workman has reason to prefer, Smeaton must either have lost sight of the influence which the relative forces of adhesion of the lime paste to the sand, and of the cohesion of the particles of paste amongst themselves, must have after setting upon the resistance of the compound, or he must have assumed that the former was of necessity the greater, and that each grain of sand would be perfectly coated. Probably no doubt of the beneficial effect of a certain quantity of sand arose in his mind, and he adopted the view of the question in vogue in his day; his experiments, therefore, had reference rather to a point of manipulation than of principle; he wished to ascertain how far extra beating and perfect amalgamation would counteract what was considered an extra dose of sand.

Vicat, although doubtless led by his experiments to very correct results on the comparative resistances of mortars of different limes, yet carried on his trials generally in so unsatisfactory a manner, that General Sir Charles Pasley was led to

regret that he could not attach to them that confidence which the author places in them. In many instances he adopts views on small differences of resistance which further experiments would have caused to disappear. His opinions, therefore, should not have great weight given them, when unconfirmed by other observers. He draws distinctions between the composition that should be given to mortars—according as they are made from fat or hydraulic lime—as they are slaked by the ordinary method, by immersion or spontaneously, and according as they are intended for exposure to weather, to damp, or to vicissitudes of heat and cold. For fat lime, slaked in the ordinary method to be exposed to air, he gives the preference for strength and resistance to frost to 240 parts of sand to 100 of stiff paste of lime; for exposure to damp, he states that fat limes so slaked lose in resistance if more than 50 parts of sand to 100 of paste are used; for covered parts of buildings he puts the maximum limit of sand at 55 parts to 100 of lime in paste. He also asserts that the "intervention of pure sand does not tend, as was before believed, to augment the cohesion of which every kind of lime indifferently is susceptible, but it is injurious to rich limes, very serviceable to the hydraulic and eminently hydraulic limes, and is neither beneficial nor injurious to the intermediate kinds."

Colonel Raucourt de Charleville, an admirer of Vicat, and who was at one time employed by the Emperor of Russia on account of his experience in mortars, enlarges upon and illustrates, after a Frenchman's manner, the idea already quoted from Smeaton's work on the cause of the hardness imparted by sand to mortars. He states that "whenever the sand is harder than the cement, as there exists between them a reciprocal action, the more sand a mortar contains the harder it will be; that, in consequence, in order to obtain a mortar of maximum resistance it is necessary (1) that the sand be of such a size as to yield the greatest mass possible in a given volume; (2) that the grains of sand be arranged one against another; (3) that the cement to unite them only fills the intervals which separate the grains. Every addition beyond this will only do harm, just as abundance of felspar or mica injures the resistance of granites, which is only a particular case of this general principle, that the resistance of a mixture of substances depends chiefly on the resistance of the component of which there is most; whence it results that the minimum of cement or enveloping parts which can be added to sand, or the parts enveloped, to make the best mortar, is decided by the measure of the voids of the sand." Then follows an important

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modification, which, indeed, appears to upset his illustration, if not his theory:—"With porous sands, the proportion of lime should be the same as for cement. With smooth sands, which cannot attach themselves mechanically to the lime, and which act on it as on the clays, in dividing them, the best plan would be not to add sand; but one does it for economy's sake, and especially because the employment of net lime is almost impossible on account of shrinkage." He recognises, then, the necessity that there shall be either a strong mechanical or a chemical adhesion to the sand, to enable the sand to impart strength to mortar; but if hydraulic limes have an action on sand, they have it by means of the free lime they contain, and pure lime would be more effective; next, the felspar has no chemical action upon quartz, and in the strongest granite the particles of quartz are quite as smooth as surfaces of sharp river sand; the granite illustration, therefore, of the general principle should better apply to the fat than to the hydraulic limes, and it is peculiarly to the fat limes that the common notion of just filling the voids of the sand is held to apply. Hydraulic limes are supposed to require somewhat less, and the theoretic reason given for this difference is that they already contain matter which is not calcareous; practically less is used because they do not, as Rondelet found, produce so fat a paste, and will not carry so much sand without working short.

The work of Sir Charles Pasley illustrates this point, and affords a striking example of the influence which a long-received opinion may have over minds most given to investigation and experiment, and the least disposed to receive matters on trust. "We found," he says, "by repeated experiments at Chatham that one cubic foot of Halling lime weighed nearly the same when fresh from the kiln, and by the gradual addition of water that it dilated to the same increased bulk in the state of quicklime powder, but when worked up into mortar, not too short for use, that it would not bear quite so large a proportion of sand as the common chalk lime had done. This experiment, leading to a result in opposition to a common opinion amongst the builders of the Metropolis, which is that the Dorking and Halling limes, as being stronger limes, will, when made into mortar, bear more sand than common chalk lime, I was induced to examine the principle upon which they found this opinion, which on consideration appears to me to be erroneous, because these two limes are undoubtedly in an intermediate state between pure lime, which is the weakest, and the water cements, which are the strongest of all calcareous cements, and every one will

acknowledge that the proportion of sand which will make good mortar with chalk lime would entirely ruin cement, which is scarcely capable of bearing one-third of that quantity. Hence it follows that the hydraulic limes ought not to admit of so much sand as chalk, but that they will bear more than cement without being injured."

The reasons for the London builders' notions on the subject can be accounted for by the fact of the misnomer of grey chalk lime already alluded to, for stone limes slake to a bulkier paste than chalk limes, as they contain more lime in a given measure; tunnel-burned lime also, such as the white chalk, contains more core than the flare-burned grey lime; but it must at once be admitted that if the proportion of sand which will make good mortar with chalk lime will not ruin all cements of the same natural character as those to which Sir Charles Pasley alludes, his whole argument falls to the ground. The practical builder has no need of any further proof than Portland cement daily gives him. He may be in doubt whether the sand has a beneficial effect on its strength or otherwise; but he will have no hesitation in denying Sir Charles Pasley's supposition that even a large proportion spoils it.

NORTHERN ARCHITECTURAL ASSOCIATION.

In the annual report for the thirty-fifth session of the Northern Association the committee say they are glad to be again able to record the increased prosperity of the Association. During the session, and since the last annual report (April 26, 1893), 9 members, 8 associates and 8 students have been elected, and the roll now stands as follows:—Members, 40; associates, 45; students, 28—total, 113. The increasing prosperity of the Association is no doubt partly due to the acquisition of a permanent room, and to the formation of the nucleus of a library, which is now contained therein; also, it is hoped, in a measure owing to the endeavours that have been made to cause its success.

In the summer circulars were issued to the members of the Association appealing for donations of books and for subscriptions towards the formation of an architectural circulating library, and, as a result, during the year over 40% and several books have been presented. The aim of the library committee (Messrs. J. H. Morton, F. W. Rich, H. C. Charlewood and A. B. Plummer) has been to select and suggest books from the list recommended to students by the Institute. A gift of

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about forty volumes has lately been received from Mr. J. G. Walker. Better accommodation is about to be provided for the library, and as the collection is still far from complete further help is requested. The thanks of the Association are due to Mr. H. C. Charlewood, the hon. librarian, for the valuable services he has rendered in connection with the library.

In September the committee agreed to issue a circular offering a first prize of books, value 2*l.* 2*s.*, and a second, value 1*l.* 1*s.*, for the best sets of drawings, as follows:—One sheet to comprise one of the three orders, Doric, Ionic or Corinthian, fully figured, drawn in outline, with the ornament and enrichment filled in. The sheet to comprise two columns of one order, with entablature complete, drawn to a scale of $\frac{1}{4}$ inch (the columns being not less than 20 feet high and the details $\frac{1}{4}$ th full size). Also one sheet with one example of the Early English, Decorated or Perpendicular periods, such as a door, a window or an arcade, in plan, elevation and section. It was stated to be desirable that one of the above drawings be from actual measurement, and that they be completed by February 16, 1894. In response two sets of drawings were received under mottoes, "Pax" and "Pupil." Mr. Archibald Dunn again kindly adjudicated upon these drawings, and by his award the first prize was given to "Pax" (Mr. M. G. Martinson); second to "Pupil" (Mr. H. W. Featherstone).

The hon. secretary of the N.A.A. Students' Sketching Club reports as follows on February 21, 1894:—

"In presenting the fourth annual report, your committee regret that the progress mentioned in previous reports has not been maintained, and, although not wishing to shirk their responsibility, think that the individual members are greatly to blame in not seconding their efforts. A great number of places were suggested at the last annual meeting as being suitable for visits, but beyond that very little interest has been manifested in the meetings. With the very large membership of associates and students, and the facilities offered, the session should have been much more successful. An excellent opportunity of visiting Fountains Abbey and Ripon Minster was afforded on May 6, but only five members availed themselves of it. A meeting was also held at Hexham Abbey, and there was a better attendance. Another visit should have taken place at Tynemouth Priory, but had to be abandoned on account of the necessary permission not coming to hand. With the view of further interesting some of the younger members, we recommend the addition of three students to the sketching club committee."

The first excursion meeting of the session was held on June 3, 1893, at Hartlepool. The members travelled from Newcastle in a special saloon carriage, and on arriving at East Hartlepool they first visited the fine old church of St. Hilda, over which the party were conducted by Mr. Carse, the clerk of works, who kindly explained the recent restorations. Crossing the ferry, and walking to West Hartlepool, visits were made to the following:—Church of St. Paul (Mr. C. H. Fowler, F.S.A., architect); church of St. Aidan (Mr. J. H. Morton, F.R.I.B.A., architect); old church at Stranton (renovated by Mr. J. H. Morton); and the Municipal Buildings (Messrs. Freeman & Robins, architects). The members afterwards dined together at the Royal Hotel, and returned to Newcastle by the 9 P.M. train. Thanks were accorded to Mr. Morton for guiding the party during the day.

On July 1 a meeting was held at Durham, and, by the kind permission of the Dean and Dr. Plummer, the whole of the cathedral and castle buildings were inspected. The members had tea together at the Three Tuns Inn in the evening.

The annual excursion was held on July 12. The members travelled in a special saloon carriage by the 9.30 A.M. train south. A stay of an hour and a quarter was made at York, and the minster was visited. They afterwards proceeded to Selby and thoroughly inspected the abbey church. Conveyances were then taken to Hemingbrough, where the ancient collegiate church was inspected. Upon returning to Selby the party dined together at the Londesborough Arms.

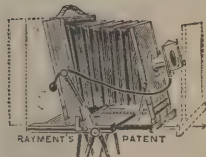
On July 29 a meeting was held in Sunderland, and the following buildings were visited:—1. St. Hilda's Bishop Lightfoot Memorial Church (Messrs. Hicks & Charlewood, architects); 2. St. John's (Wesleyan), (Mr. Curwen, of London, architect); 3. St. George's (Presbyterian), (Mr. Wilson, of Glasgow, architect); 4. St. Columba's Church (Mr. C. H. Fowler, architect), and St. Columba's Schools (Mr. F. C. Caws, architect). The party had tea together, at the Roker Hotel, in the evening.

On October 7 a meeting was held at the Durham College of Science, Barras Bridge, and a vote of thanks was passed to Mr. F. W. Rich, architect, for kindly conducting the party over the new buildings.

On October 28 the Ouseburn Board Schools (Mr. F. W. Rich, architect) were visited. The members assembled at Grey's Monument, and by the kindness of Mr. Rich a conveyance was provided for them to and from the schools.

The first meeting of the winter session was held at the

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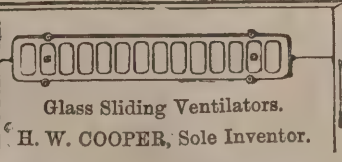
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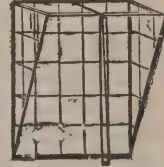
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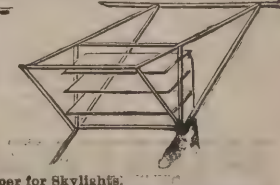
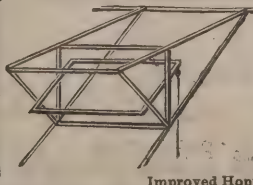
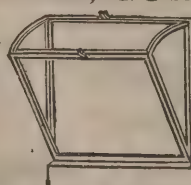
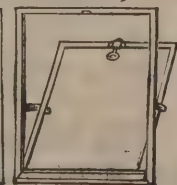
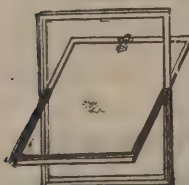
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Meeting-room, Art Gallery, on November 29, 1893, at which the President read his inaugural address, and Mr. E. Eugene Brown, M.I.C.E., read an interesting paper on "Electric Lighting," and illustrated the same with diagrams and models. A letter was read during the evening in connection with the prizes offered by the committee for the best set of sketches (books value 2*l.* 2*s.* and 1*l.* 1*s.*), and for measured drawings (books value 2*l.* 2*s.* and 1*l.* 1*s.*). The award was as follows:—

Sketches.—1st Prize, "Tynedale" (Mr. W. H. Reed); 2nd prize, "Yorkshire" (Mr. G. C. C. H. Crawhall).

Measured Drawings.—1st Prize, "Fontenensis" (Mr. C. D. Rochester); 2nd prize (Mr. R. P. Twizell).

At a subsequent meeting of the committee they resolved that the third and fourth sets of drawings, submitted by Mr. R. H. Morton and Mr. S. E. Barrow, be highly commended in the annual report.

On December 13 a meeting was held at the Art Gallery Meeting-room, at which Mr. H. W. Chubb, M.I.C.E., of London, delivered a lecture on "The Construction of Locks and Safes." He also dwelt with strong rooms and the ancient and Mediaeval branches of the subject. The lecture was illustrated by means of diagrams, models and lantern slides. Thanks were accorded to Mr. Chubb, and also to Mr. Cackett, for kindly illustrating the lecture by means of his lantern.

A sessional gathering was held on January 10, when Mr. Cackett exhibited by limelight and explained a number of architectural slides, illustrating various English cathedrals.

On January 13 the members visited the Chillingham Road Board Schools, Newcastle, when (in the absence of the architects, Messrs. Oliver & Leeson), the party were conducted through the buildings by Mr. Walker, the clerk of works. The "Plenum" system of heating and ventilating was in operation, and explained by Messrs. Dinning & Cooke.

On January 17 Mr. Bacon delivered a lecture on "Stained-glass in Relation to Architecture," illustrated by means of specimens and diagrams, and on January 24 Mr. C. E. Oliver, F.S.I., read a paper entitled "Notes on New Zealand Timbers," and exhibited specimens.

The claims and advantages of the Northern Architectural Association were laid before a meeting of architects held in the Masonic Hall, Sunderland, on January 27, 1894, and at this meeting Mr. G. T. Brown, of Sunderland, was elected corresponding member for that district. At this same meeting Dr. Gibbon, of South Shields, delivered an excellent lecture on "Athens," illustrated by limelight views.

The fourth annual social gathering in connection with the students' sketching club was held on February 5, 1894, in the Grand Assembly Rooms, Newcastle. An excellent programme of music and collection of photographs and drawings were provided, and there was a large attendance of members and their friends.

On February 14 Mr. Ralph Hedley read a paper on "Wood-Carving," and illustrated his remarks by several charcoal sketches executed on the spot. He also exhibited a number of photographs of carved work, together with examples of wood-carving. On February 28 Mr. A. B. Plummer read a paper on "Zinc and Zinc-roofing," and the subject was illustrated by means of specimens, models and diagrams. On April 7 the members of the Association, to the number of fifteen, visited the new Prudential Assurance Buildings (Messrs. Waterhouse & Sons, architects) in Dean Street, Newcastle, and were conducted by Mr. Monteath, the clerk of works.

The thanks of the Association are again due to those who have granted permission and given assistance in connection with the Saturday afternoon visits, also to the readers of papers during the winter session and to all who have in any way contributed towards the successful working of the Association during the past year.

BUDA-PESTH ELECTRIC TRAMWAYS.

SOME little time ago Alderman Ward, member of the Leeds County Council, being over in Vienna on business, paid a visit to Buda-Pesth with a view to seeing the system of electric tramways there in use, and he has kindly favoured us (the *Leeds Mercury* says) with an account of what he learnt in the gay capital of Hungary. The population of Buda-Pesth, it may be explained, is 550,000, but, in addition, there are 50,000 troops stationed there, so that it may be reckoned in round numbers at 600,000. Beautifully situated on the banks of the "Blue Danube," its people are of a much more easy-going nature than can be found in an English manufacturing town, and it almost, therefore, stands to reason that its vehicular arrangements should be of a somewhat luxurious character. The Buda-Pesth electric tramway was first begun some six or seven years ago by Messrs. Siemens & Halske, and when it had been completed, so far as the present lines are concerned, they floated it as a company with a capital of 4,000,000 florins, which in English money is a little over



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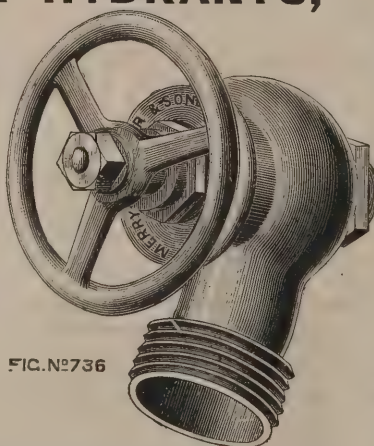


FIG. N°2736

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330,000/. The system is a conduit one. There are no overhead wires, but the electricity is conveyed underground with a conduit 22 inches deep. This depth is necessitated in order to avoid as far as practicable the possibility of a stoppage of traffic by rain-water and snow. The conduit is connected with the sewer at various intervals, and by this means any sudden influx of water is got rid of. The company in the first year of its existence paid a dividend of 7 per cent. on its capital, and last year it paid 8 per cent., and the shares on the market to-day stand at 225 florins for every 100 florins invested. The power-station is centrally situated, and from this point all the lines are worked. The total capacity at the company's disposal represents 1,750 horse-power, which means really that they possess a duplicate service of dynamos and engines in the event of a breakdown. On ordinary week-days a force of about 600 horse-power is required to work the traffic, but on Sundays—the Continental holiday-making day—a force of 800 to 900 horse-power is required. The fare charged is 6 kreutzers for one length; if a change is made, taking an additional line, the charge is 8 kreutzers; but if a double change is made, then 10 kreutzers is the fare. This means that for about 2d. English money a passenger may travel six to seven miles. The total length of the lines laid down on the conduit system is about 30 kilometres, or 16 English miles. There is also a short distance of tramway on the overhead system, but this will be reconstructed on the conduit system as soon as convenient. At first the company experienced some little difficulty in working the lines, occasioned by mischievous people interrupting the electric current by putting a piece of metal down between them; but this form of amusement did not last very long, and they have experienced no trouble of late. Slight interruption has also been met with from drifting snow, but it has never been of any serious duration, from half to three-quarters of an hour always sufficing to clear away the obstruction. In the low-lying portions of the city heavy rains have also occasioned slight difficulty, owing to the sewers not having sufficient capacity to take off the surface-water, which has flooded back into the conduit. But, with these slight drawbacks, the system works as smoothly as can be wished. Each carriage is constructed to carry thirty-two passengers, but as no by-laws exist against overcrowding standing-room is permitted, and so on occasions cars may be seen with from sixty to seventy people in them. Each car, including the motor, weighs from 4½ to 5 tons, and costs about 500/. The system is most popular in Buda-Pesth,

and last year the company carried no less than twelve and a half million passengers, which practically means that, taking an average, each individual inhabitant used the cars twenty-one times in the course of the year. This year, however, the company expect to overtop these figures by 2,000,000. Some idea of the favour in which the tramways are held may be gathered from the fact that on the Sunday before Whitsuntide no less than 75,000 people, or one in every eight of the population, used the cars, and the number run on that day was a little over one hundred. From the figures quoted no doubt of the success of the Buda-Pesth tramways can be entertained, but the cost of construction is very great. In fact, the cost per kilometre, including the central power-station, the workshops, the waiting-rooms, cars, &c., is 95,000 florins. A kilometre is about three-fifths of an English mile, so that the cost represents about 13,350/. per English mile.

WASTE OF COAL.

At the meeting of the North Staffordshire Mining Institute the subject of waste of coal was discussed. Mr. J. J. Prest said formerly it was customary to leave probably a third of a seam in the northern coalfield in the system of work then adopted; under similar conditions now probably not 5 per cent. all round was lost. In fact, many of the old workings were being reopened to recover coal left in former days. A large quantity of slack was buried without any good reason. The chief loss was in the system of leaving barriers surrounding the coal properties of individual proprietors, with the object of protecting themselves against the operations of their neighbours. Speaking of the North Staffordshire coalfield, he said, assuming each colliery proprietor had a royalty of 640 acres, or one square mile, and he was compelled to leave a barrier of forty yards, that would represent about 58 acres of coal in each seam. Assuming also that the area of the coalfield was 75 square miles, and there was an average thickness of 75 feet of workable coal, there would be 4,350 acres of workable coal abandoned, amounting to 391,500,000 tons, of the value of 9,787,500/., at 30/. per foot per acre, without taking into consideration its economic value to the consumer at large. With a view of preventing waste, he directed attention to the suggestions of the late Sir George Elliot on the subject, and said he thought they might also do much by the appointment of drainage commissioners, who should undertake the entire

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pumping arrangements in any coalfield. Loss of coal could to a large extent be prevented when new seams of coal had to be opened. Mr. T. E. Storey, Mr. E. B. Wain, Mr. J. R. Haines, Mr. Baylis, Mr. W. N. Atkinson and the President took part in the discussion. It was stated in reference to the drainage that the scheme in operation in South Staffordshire might answer there because the seams were practically flat, whereas in North Staffordshire at one colliery a seam might be worked at a depth of 100 yards, and in the adjoining colliery the same seam might be worked at a depth of 500 yards.

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PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9493. William Spiers Freeman, for "Improvements in mine-shafts, well-linings, chimney and other shafts, and apparatus for constructing the same."
9523. Joseph Childs, for "Improvements in revolving cowls for chimneys and ventilating shafts."
9549. Edward William Malpass, for "Improvements in window-blind rollers."
9556. Robert Mayon Robson, for "An improved draught preventer for chimneys."
9682. August Schmeil and Paul Soar, for "Improvements in skylights."
9756. Cranston Waddell, for "Improved means of operating and automatically locking sash-windows."
9784. John Jackson, for "Improvements in or relating to window-sashes."
9791. Jane Louisa Bolton, for "A new window-blind roller."
9813. Percy Ruskin Allen, for "Improvements in or applicable to meters or apparatus for supplying electricity, gas or other substance in exchange for coin."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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* * *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

CONTRACTS OPEN.

ANDOVER.—June 8.—For Class and Cloak Rooms to National Schools. Rev. P. R. P. Braithwaite, Vicarage, Andover.

ASHTON-UNDER-LYNE.—June 9.—For Pulling-down Premises and Building Leather Works, Sheds, Shops, Offices, &c. Mr. T. D. Lindley, Architect, Ashton-under-Lyne.

BARKING.—June 12.—For the Erection of Disinfecting House, Additions to Engine-house, Erection of Engineer's Cottage and the Construction of Barge Berth and Timber Framing to Wall of Town Wharf. Mr. C. J. Dawson, Engineer, Local Board Offices, East Street, Barking.

BARRY.—June 18.—For Construction of Dock (20 Acres) and Works in Connection. Mr. John Wolfe Barry, Engineer, 21 Delahay Street, Westminster.

BATLEY.—June 11.—For Building Three Residences. Mr. John H. Brearley, Architect, Commercial Street, Batley.

BATLEY.—June 16.—For Additions to Working Men's Club Buildings. Mr. Walter Hanstock, Architect, Branch Road, Batley.

BELFAST.—June 15.—For Enlarging St. John's Church National Schools, Whitehouse. Mr. Samuel P. Close, Architect, 53 Waring Street, Belfast.

BIDEFORD.—June 18.—Grand Stand, Horse Boxes, Bandstands, &c. Mr. T. A. Fogarty, Secretary to the Bideford Horse Show Committee.

BIRKENHEAD.—June 8.—For Building Workshops at Gasworks. Mr. T. O. Paterson, Gasworks, Birkenhead.

BIRKENHEAD.—June 19.—For Alterations to Laird School. Mr. C. Brownridge, Borough Engineer, Town Hall, Birkenhead.

BIRMINGHAM.—June 11.—For Erection of Building and Engineering Works in Connection with the Race-course. Messrs. Owen & Ward, Engineers, 71 Colmore Row, Birmingham.

BOROUGHBRIDGE.—June 18.—For Building Police Station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

BRECON.—June 23.—For Erection of a Strong Room. Mr. H. Edgar Thomas, County Hall, Brecon.

BURNGULLOW.—June 26.—For Construction of Railway Station, &c. Mr. G. K. Mills, Secretary, Paddington Station.

CAMBERWELL.—June 11.—For Paving (completion) of Goldie Street. Mr. O. S. Brown, Vestry Hall, Camberwell.

CASTLETON.—For Building Three Shops and Houses. Mr. A. Chadwick, Architect, Castleton.

CHESTER-LE-STREET.—June 19.—For Building Shops, &c. Mr. Gibson Kyle, Architect, 145 Pilgrim Street, Newcastle-on-Tyne.

CITY OF LONDON.—June 12.—For Paving with Wood a Portion of the Carriageway of Swan Street, Minories. Mr. Henry Blake, Sewers Office, Guildhall.

CLEETHORPES.—June 13.—For Iron Pipe Sea Outfall and Works to Sewers. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

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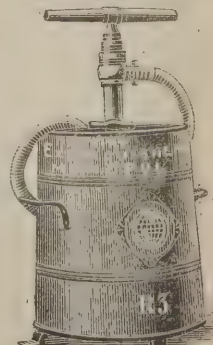
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CROXDALE COLLIERY.—June 8.—For Additions to Sewage Purification Works. Mr. G. Gregson, Surveyor, 43 Western Hill, Durham.

CROYDON.—June 9.—For Additions to Board Schools. Mr. Robert Ridge, Architect, Croydon.

EBBW VALE.—June 9.—For Building Baptist Chapel. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

EXETER.—June 23.—For Repairs at Lower Market. The City Surveyor, 18 Bedford Circus, Exeter.

EXMINSTER.—June 12.—For Extension of the Devon County Asylum. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

GATESHEAD.—For Building Mission Room. Mr. Bennett, 3 St. James Terrace, Leazes, Newcastle-on-Tyne.

GLOUCESTER.—July 2.—For Altering Existing Offices, Erection of Council Chamber and other Works at Shire Hall. Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GRENDON.—For Additions to National School. Messrs. Talbot-Brown & Fisher, Architects, Wellingborough.

HACKNEY.—June 13.—For Supply and Delivery of Gully-grates, Manhole-covers and other Sewer Ironwork. Mr. James Lovegrove, Town Hall, Hackney.

HALIFAX.—June 16.—For Building Liberal Club. Mr. Medley Hall, Architect, Crossley's Buildings, 29 Northgate, Halifax.

HANLEY, STAFFS.—June 16.—For Enlargement of Post Office. Mr. H. W. Primrose, Secretary H.M. Office of Works, 42 Whitehall.

HANWELL.—June 25.—For Supply of Broken Jersey or Channel Islands Granite. Mr. W. S. James, Local Board Offices, Hanwell, W.

HARROGATE.—June 28.—For Building Detached Residence, The Duchy Estate. Mr. T. Butler Wilson, F.R.I.B.A., Architect, Leeds and Harrogate.

HEMSWORTH.—June 12.—For Pipe Sewers. Mr. Richardson, Surveyor, Imperial Buildings, Bond Street, Leeds.

HOMERTON.—June 13.—For Building Patients' Block and Two Staff Blocks at the Eastern Fever Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

HORNCHURCH.—June 9.—For Building Two Cottages at Cottage Homes. Mr. F. J. Smith, Architect, 17B Great George Street, Westminster.

HORNSEY.—June 11.—For Sewering, Levelling, Paving, Metalling, Channelling and Making Good Holy Innocents Road. Mr. T. de Courcy Meade, C.E., Local Board Offices, Southwood Lane, N.

HORSHAM.—June 9.—For Building Residence, Stables, &c. Mr. C. H. Burstow, Architect, Horsham.

KIDDERMINSTER.—June 11.—For Building Board School. Mr. J. T. Meredith, Architect, Bank Buildings, Kidderminster.

KING'S LYNN.—June 23.—For Building Board School, &c. Mr. Herbert Green, Architect, Norwich.

KINSON.—July 7.—For Building Police Station and Justice Room. Mr. Walter J. Fletcher, County Architect, Wimborne.

LANCASHIRE AND YORKSHIRE RAILWAY.—June 13.—For Reconstruction and Widening of Bridge at Bury. The Engineer, Hunt's Bank, Manchester.

LEEDS.—June 11.—For Building Lavatory for the Guardians. Mr. T. Winn, Architect, 90 Albion Street, Leeds.

LONDON.—June 13.—For Officers' New Quarters, &c., at Workhouse, Poland Street, W. Messrs. J. Waldram & Son, Architects, 13 Buckingham Street, Charing Cross, W.C.

MEALSGATE.—June 9.—For Building Wesleyan Chapel and School. Messrs. Tate Bros, Mealsgate.

MICHELMERSH.—June 14.—For Construction of Covered Surface Reservoir. Mr. J. T. Burnett, Guildhall Chambers, Southampton.

MOUNTAIN ASH.—June 14.—For Building Cottages and Semi-detached Villas. Mr. M. Morgan, Maesydderwen, Mountain Ash.

NELSON.—June 11.—For Building Five Houses, Shop and Coachhouse. Mr. H. Whitaker, Architect, 26 Every Street, Nelson.

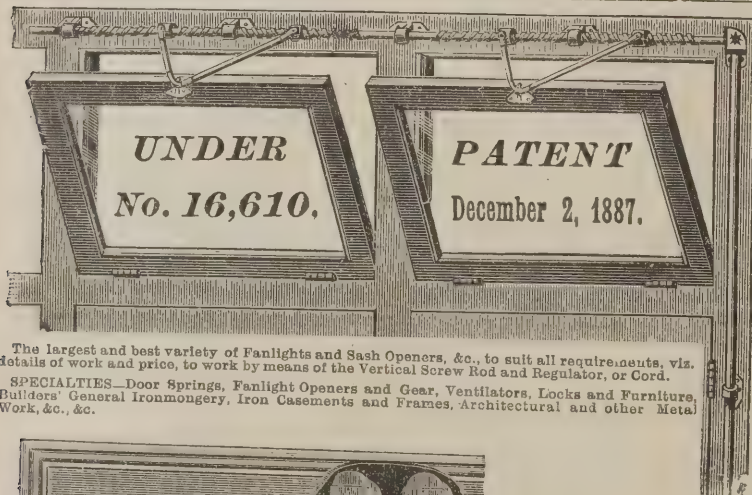
NEWNHAM-ON-SEVERN.—June 9.—For Additions to National Schools. Mr. W. Spence, Architect, Cinderford.

NEWRY.—June 14.—For Building Intermediate School and Master's House. Mr. Robert A. Mullan, Solicitor, Newry.

NEW TREDEGAR.—June 18.—For Additions to Workmen's Hall. Messrs. Aaron Davies & Son, Architects, Pontlottyn.

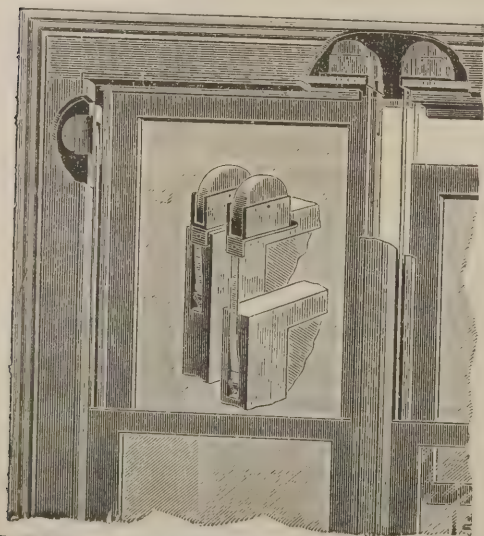
NOTTINGHAM.—For Enlargement of Dining-hall at Union School. Mr. A. H. Goodall, Architect, Market Street, Nottingham.

NUTHURST, NEAR HORSHAM.—June 9.—For Erection of Stables. Mr. C. Burstow, Horsham.



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PETERBOROUGH.—June 9.—For Additions to Workhouse Infirmary. Mr. J. Stallebrass, Architect, North Street, Peterborough.

PORTH.—June 11.—For Police Courts. Mr. F. Gibson, Architect, Pontypridd.

PORTRCAWL.—June 11.—For Additions to National Schools. Messrs. Lambert & Rees, Architects, Bridgend.

PORTSMOUTH.—June 19.—For Alterations to Board Schools. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

RAINHILL.—June 9.—For Building Nurses' Home at Lunatic Asylum. Messrs. Grayson & Ould, Architects, 31 James Street, Liverpool.

RICHMOND.—June 8.—For Building Workmen's Dwellings. The Borough Surveyor, Town Hall, Richmond, Surrey.

ROMFORD.—June 18.—For Building Cottage. Mr. F. Whitmore, Architect, Chelmsford.

ROTHERHAM.—June 11.—For Restoring, Reseating, &c., All Saints Church, Loughton-en-le-Morthen. Messrs. Milnes & France, Architects, Bradford.

ROWLEY REGIS.—June 9.—For Extension of Board School. Mr. J. T. Meredith, Architect, Kidderminster.

ROMSEY.—June 9.—For Enlargement, &c., of Schools, Awbridge and Braishfield. Rev. G. Haines Jones, Awbridge Vicarage, near Romsey.

SHOREDITCH.—June 20.—For the Erection of Two Cottages for Ailing Children. Mr. F. J. Smith, F.R.I.B.A., 17B Great George Street, Westminster.

SOUTHAMPTON.—June 14.—For Covered Service Reservoir at Mitchelmersh. Mr. J. J. Burnett, Guildhall Chambers, Southampton.

SOUTHWARK.—June 12.—For Supply of Oils, Colours, &c. Mr. A. Millar, Vestry Hall, Borough Road, S.E.

ST. HELEN'S.—June 13.—For Building Free Library and Technical School. Messrs. Briggs & Wolstenholme, Architects, 1 Richmond Terrace, Blackburn.

STOCKTON-ON-TEES.—June 12.—For Enlargement of Post Office. Mr. W. H. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

STRETFORD.—June 11.—For Building Forty Dwellings. Mr. John Bowden, 14 Ridgfield, Manchester.

SWANSEA.—June 9.—For Machine and Carriage Sheds. Mr. H. S. Ludlow, 8 Fisher Street, Swansea.

THEYDON BOIS.—June 20.—For Additions to Parochial School. Mr. James Winter, Architect, Epping, Essex.

TONYPANDY.—June 11.—For Building School. Mr. J. Rees, Architect, Hillside Cottage, Pentre, Rhondda.

TOTTENHAM.—June 12.—For Making-up Portions of Langham Road, Hillside Road and Varry Road. Mr. P. E. Murphy, 712 High Road, Tottenham.

TOTTENHAM.—June 26.—For Supply and Delivery of Dressed and Tooled Robin Hood Bevelled Coping for Boundary Wall, Bruce Castle Park. Mr. P. E. Murphy, Coombes Croft House, 712 High Road, Tottenham.

TOTTENHAM.—June 26.—For Supplying and Fixing Wrought-iron Boundary Fence, Stays, Large and Small Entrance Gates, &c., for Bruce Castle Park. Mr. P. E. Murphy, 712 High Road, Tottenham.

TOXTETH PARK.—June 8.—For Construction of Six Destructor Cells, with Henderson's Patent Firebars, Boulnois & Brodie's Patent Feeding Arrangement, Multitubular Boiler Cremator, Special Dust Screens, Flues, Dampers and High-level Platform, &c. Mr. John Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park.

TREDEGAR.—June 11.—For Additions to School. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

WAKEFIELD.—June 11.—For Building Assembly Hall, &c., and Restoration of Old Grammar School. Messrs. Simpson & Richardson, Architects, Southgate Chambers, Wakefield.

WELLS.—June 19.—For Building Small Block and Water-closet at Lunatic Asylum. Clerk of Works, Bath Lunatic Asylum, Wells.

WEST BROMPTON.—June 12.—For Painting, White-washing and Cleaning-out the Infirmary in Fulham Road. Mr. H. Saxon Snell, 22 Southampton Buildings, W.C.

WEST BROMWICH.—June 18.—For Laying Iron Pipes, Construction of Detritus Tanks, &c. Mr. J. T. Eayrs, Borough Engineer.

WEST HAM.—June 12.—For Supply of Stoneware Pipes, Gullies, &c. Mr. Lewis Angel, Town Hall, Stratford, E.

WESTMINSTER.—June 22.—For Erection of Officers' New Quarters and Works in Connection therewith at Workhouse in Poland Street. Messrs. J. Waldram & Sons, 13 Buckingham Street, W.C.

WESTON-SUPER-MARE.—June 12.—For Temporary Grand Stand. Mr. S. J. Wilde, Architect, Boulevard Chambers, Weston-super-Mare.

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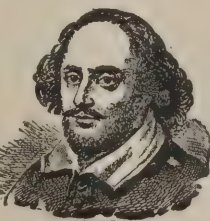
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WEST THURROCK.—June 9.—For Erection of Additions to Board School at Purfleet. Mr. F. J. Sturdy, 44 Finsbury Pavement, E.C.

WEXFORD.—June 15.—For Building House for Light-keeper, Hook Tower Lighthouse. The Secretary, Irish Lights Offices, Dublin.

WHITECHAPEL.—June 12.—For Painting and Structural Works at Infirmary in Baker's Row. Mr. Bruce J. Capell, 70 Whitechapel Road.

YARMOUTH.—June 23.—For Extension of National Schools. Mr. John Fowle, Architect, Bouldnor-on-Sea, Yarmouth, Isle of Wight.

YEovil.—June 18.—For Building Board Schools. Mr. J. N. Johnston, Architect, 21 Princes Street, Yeovil.

YSTRAD.—June 16.—For Pulling-down and Rebuilding James's Hall. Mr. J. Rees, Architect, Hillside, Pentre, Rhondda.

THE ALBERT PALACE, BATTERSEA.

It has been stated in some of the journals that the materials of the Albert Palace and Connaught Hall, Battersea, were sold at great sacrifice. That is erroneous. Indeed, we are surprised that the auctioneers, Messrs. Horne, Son & Eversfield, were able to obtain such high prices as prevailed. It should be remembered that the materials were supposed to be second-hand when employed. Of only a part of them could that be said, but the prejudice would of course affect all prices. However, the auctioneers managed to obtain sums that were exceptionally high. For the glass (exclusive of what was employed in the roof lights, which went with the ironwork), they obtained about 50%, which was a most liberal price, as the purchaser had to take down, pack and remove the glass. The floorboards were sold at 5s. per square, and joists 4s. per standard. Comparing those prices with those for new timber, it becomes evident that the fullest value was realised. The 800 tons of ironwork sold for 900%, but it should be remembered that at least 20s. a ton will have to be paid by the purchaser for taking down. The price given for hot-water piping was 3s. 10s. a ton, and it can be purchased new for 5s. The zinc on the roof fetched nearly 14s. per ton. The whole of the materials realised equally satisfactory prices, and the total exceeded the estimate made previous to the auction by about 40 per cent.

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A. Taylor, builder	£900 0 0
J. Thornley, joiner	315 0 0
C. Dryden, plasterer	80 0 0
M. Fleming, slater	66 10 0
B. Denison, plumber and glazier	30 0 0
Beaumont Bros., painter	28 10 0

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For Construction of New Road.

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E. C. Newby & Co.	2,050 0 0
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Bowers & Son	2,041 10 0
W. Cox	1,998 10 0
Knox & Wells	1,990 0 0
Hatherly & Carr	1,987 0 0
T. Wood & Son	1,953 0 0
S. SHIPTON & SON, Cardiff (accepted)	1,925 0 0
Morgan & Groom	1,900 0 0
J. Haines	1,898 0 0
Lattey & Co.	1,850 0 0
R. Dinham	1,800 0 0

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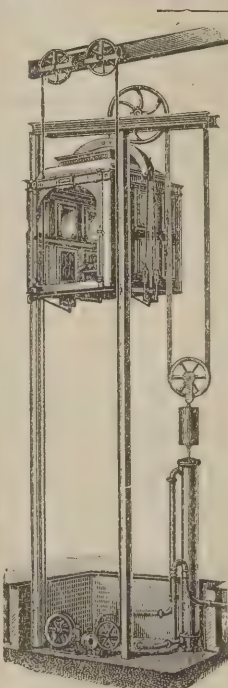
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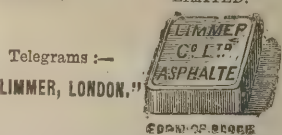
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W. Beattie & Sons, Edinburgh	370	11	3
James Young & Sons, Edinburgh	270	0	0
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R. A. Lowe, Chislehurst	4,139	0	0
J. O. Richardson	3,809	0	0
W. Mills	3,750	0	0
T. D. Leng	3,717	0	0
Gorham	3,673	0	0
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C. Ruff, Wellingborough	267	10	0
H. Dorman, Wellingborough	265	0	0
W. Berrill, Wellingborough	260	0	0
C. W. Abbott, Wellingborough	255	0	0
T. & C. BERRILL, Irchester (accepted)	253	0	0

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J. & H. COCKS (*accepted*) £154 0 0

For Erection of a Concert Hall at the Black Lion Public-house, High Street, East Ham, for Mrs. C. Keep. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.
H. Wall & Co. £1,269 0 0
Hearle & Farlow 1,190 0 0
W. Atkins 1,180 0 0
J. & H. Cocks 1,169 0 0
W. Shurmur 1,100 0 0
W. WATSON (*accepted*) 1,080 0 0

For Construction of Public Conveniences, Southwark Park, for the County Council.
Leete, Edwards & Norman, Limited £387 2 5
Hunter & English 385 0 0
J. Cochrane 360 0 0

For Alterations at the Alexandra Park Tavern, Wood Green, N. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.

Yardley £1,797 0 0
Todd 1,743 0 0
Walker 1,620 0 0
Simpson & Cove 1,597 0 0
Goodall 1,586 0 0
Courtney & Fairbairn 1,568 0 0
Green & Smith 1,568 0 0
Voller 1,527 0 0

For Rebuilding the King's Arms, 128 Bishopsgate Street Without, City. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.

Accepted Tenders.

Todd, structure £3,500 0 0
Lascelles, internal fittings 846 0 0
Heath, pewterer 251 0 0
Winn, gasfitter 241 0 0
Wilson & Co., kitchen fittings 223 0 0
Vaughan & Brown, electric lights 55 0 0

LONDON—continued.

For Building Billiard Room at the North London Hotel, Brondesbury. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.
COURTNEY & FAIRBAIRN (*accepted*) £1,002 2 5

For Erecting New Warehouse for Messrs. Bowman Bros., at High Street, Camden Town. Mr. J. M. KENNARD, Architect.

Killby & Gayford £13,760 0 0
Colls & Sons 13,687 0 0
Holliday & Greenwood 13,573 0 0
Holloway Bros. 13,500 0 0
Scrivener & Co. 13,494 0 0
Patman & Fotheringham 13,171 0 0
Toms 13,111 0 0
H. J. Williams 12,987 0 0
J. Allen & Sons 12,964 0 0
Gould & Brand 12,745 0 0
Shepherd 12,628 0 0
S. R. Lamble 12,329 0 0

For Completion of Wesleyan Chapel, Lock's Fields, S.E., and Erection of School. Mr. CHAS. BELL, F.R.I.B.A., Architect. Quantities prepared by Messrs. HECLIS & WRIGHTSON, Surveyors.

L. H. & R. Roberts £2,298 0 0
W. & H. Castle 2,225 0 0
Holloway Bros. 2,221 0 0
G. Parker 2,190 0 0
Battley, Son & Holness 2,136 0 0
W. VOGEL GOAD (*accepted*) 1,994 0 0

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Muir, Glasgow 450 0 0
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F. Cooper & Sons, Musselburgh 387 10 0
Bow, Glasgow (*accepted*) 265 0 0
Burgh surveyor's estimate 275 0 0

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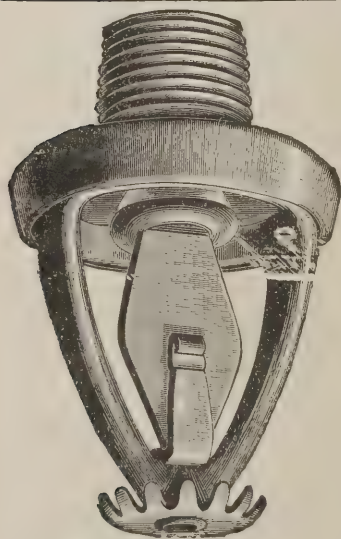
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NORTH SHIELDS.

For Laying Cement Concrete Footpaths in Charlotte Street, North Shields, for the Tynemouth Urban Sanitary Authority. Mr. JOHN F. SMELLIE, Borough Surveyor.			
W. B. Wilkinson & Co., Limited, Newcastle-on-Tyne	£459	15	0
G. Maughan, Jarrow	458	17	0
G. E. Simpson, Newcastle-on-Tyne	446	6	1
J. F. Dore, Newcastle-on-Tyne	427	0	0
S. McFarlane, Leeds	408	9	5
J. RULE, Sunderland (accepted)	350	0	0

ORMESBY.

For Building Schoolmaster's House, adjoining the Board School on Ormesby Green, for the Ormesby U.D. School Board. Mr. A. S. HEWITT, Architect, Great Yarmouth.			
J. Balls, Yarmouth	£470	0	0
J. F. W. Bray, Yarmouth	468	0	0
G. Beech, Yarmouth	448	10	0
J. Rand, Yarmouth	438	12	0
Beckett, Yarmouth	428	0	0
Carter & Wright, Yarmouth	417	0	0
F. Grimble, Yarmouth	407	0	0
G. Read, Yarmouth	404	19	0
Fuller, Martham	402	0	0
CURTIS, Gorleston (accepted)	397	4	0

ST. AGNES.

For Works for the Drainage of St. Agnes, for the Truro Rural Sanitary Authority. Mr. R. HANSFORD WORTH, Engineer, 42 George Street, Plymouth.			
W. H. Stephens, Penzance	£3,386	14	4
J. Shaddock, Plymouth	2,649	8	0
Dalbridge, Shipman & Carveth, Camborne	2,412	4	8
E. J. P. DUKE, Plymouth (accepted)	2,237	18	5
W. Hill & Co., Plymouth	2,203	0	0
J. Julian, Truro	—		

STRATFORD.

For Erecting New Welsh Calvinistic Methodist Chapel, Romford Road, Stratford, E. Mr. G. ASHBY LEAN, Architect.			
J. Grover & Son	£4,623	0	0
Simmonds Bros.	4,453	0	0
Bishop & Webb	4,444	0	0
H. J. Williams	4,428	0	0
R. & E. Evans	4,135	0	0

ST. LEONARDS-ON-SEA.

For Building Board School at Bopeep, for 400 Children, for the Hastings U.D. School Board. Messrs. ELWORTHY & SON, Architects, St. Leonards-on-Sea. Quantities by the Architects.			
H. E. Cruttenden, St. Leonards	£5,512	0	0
Eldridge & Cruttenden, St. Leonards	5,390	0	0
D. Snow, Ore	5,337	0	0
Gammon, Hastings	5,303	16	9
T. Salter, St. Leonards	5,295	0	0
W. Small, Ore	5,009	10	0
Taylor & Simmonds, Hastings	5,000	0	0
A. H. White, St. Leonards	4,977	0	0
P. Jenkins, St. Leonards	4,874	0	0
Geary, St. Leonards	4,685	0	0
Padgham & Hutchinson, St. Leonards	4,615	0	0
C. Hughes, St. Leonards	4,448	0	0
F. Cruttenden, St. Leonards	4,240	0	0
Architects' estimate	4,650	0	0

TUNBRIDGE WELLS.

For Erection of Club House, for Royal Ashdown Forest and Tunbridge Wells Golf Club.			
JOB LUXFORD, Forest Row (accepted)	£2,392	0	0

WALTHAMSTOW.

For Alterations at the Coach and Horses Tavern, St. James Street, Markhouse Lane, Walthamstow. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.			
Lascelles	£997	0	0
Courtney & Fairbairn	909	0	0
Burman & Sons	899	0	0
Walker	783	0	0
Todd	779	0	0
Voller	720	0	0
Green & Smith	716	0	0
SIMPSON & COVE (accepted)	684	0	0

WATFORD.

For Construction of a Sewer and Settling-tanks at Letchmore Heath, for the Watford Union Rural Sanitary Authority. Mr. CHAS. HEATH, Surveyor, Watford.			
Jackson, Plaistow	£357	0	0
F. DUPONT, Watford (accepted)	347	0	0
Surveyor's estimate	353	0	0

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For Building Thirty Cottages at Ystrad Rhondda, for the Tyntyla Building Club.

Davies & Co., Tenby £5,570 0 0

Jones & Davies, Trearlaw 5,550 15 0

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W. E. WILLIS, jun, Ystrad Rhondda (accepted) 5,060 0 0

R. Owen, Aberdare Junction 4,800 0 0

TRADE NOTES.

WE hear that Messrs. Forwood Bros. & Co. have advised Messrs. Baird, Thompson & Co. that the installation of their mechanical ventilation process in the steamship *Zweena* has given most satisfactory results. The owners express their intention of extending it to the remainder of their fleet. The managers of the Neptune Steam Navigation Company have formed an equally favourable opinion of the appliance; also a large firm of steamship owners in Hull, it is said, intend to carry out the system throughout their fleet.

THE County Asylum, Prestwich, near Manchester, has just been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with some more of their patent Manchester stoves, the patent Manchester stoves and grates previously supplied having proved so satisfactory.

THE Stamford Technical Instruction Committee have accepted the tender of Mr. John Woolston, of Stamford, for the erection of a technical education school on the Shambles at Stamford. Mr. Woolston's tender was for 980*l*.

THE building of the new railway-station in Weardale, Co. Durham, has been let to Mr. W. Lister, of Crook.

A FEW days since Messrs. Williams Bros. & Co. gave a private view of their new patent system of glass-roofing, for which they claim the following advantages:—The joints being butted the horizontal lapping of the glass is dispensed with,

thereby effecting a saving which the patentees estimate at from 25 to 30 per cent. A perfectly flat surface is the result, having no apertures through which the weather, however rough, can drive. The loss occasioned by breakage from contraction or expansion or vibration is obviated. Curved roofs can be covered as easily as straight. There is a great saving in cost of maintenance, as no external painting is required. There is no drip from condensation, and no rattle.

ELECTRICAL.

THE electric light has just been started in the pretty little church of St. Bride, Kelvinside, Glasgow. The supply is taken from the mains of the Kelvinside Electricity Company. The contract was carried out by Messrs. Claud Hamilton, Limited, of Waterloo, to the plans and specifications of Mr. W. Elsdon Dew, resident engineer to the supply company. The fittings are of ecclesiastical pattern in wrought-iron and copper, in harmony with the surroundings. It is understood that other churches in the district are proposing to adopt the electric light.

AT Houghton pit the electric light is to be installed, and Messrs. Hawthorn & Leslie, of Gateshead, are now engaged in the work. This is the third pit in the district owned by the Earl of Durham at which the electric light is used, whilst at Herrington New Pit an electric coal-cutter is also just now being tested.

SPECIAL collections have been made at the Leeds parish church to defray the cost of installing electric light in the church.

THE *Dundee Advertiser* says:—The fine chamber organ at Balruddery has just been reconstructed on the Hope-Jones electric system, and is now probably the finest organ in a private residence in the country. The organ has three manuals and about twenty-five speaking stops. The pipes are of exceptionally fine quality, having been voiced by Thynne. The instrument is placed in the gallery of the large hall, and is played from a movable console on the ground floor. The only attachment between the keyboards and the pipes is a flexible electric cable, and the console can be moved about to any part of the hall. Instead of stops at the side of the keyboards, there are stop keys placed over the top, exactly like a fourth row of white notes. These can be very rapidly manipulated,

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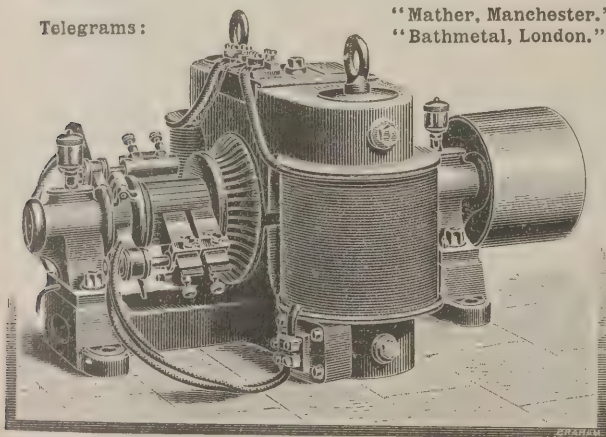
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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being put up or down as fast as a finger is run along them. One key puts off the electric current operating the stop keys. By the use of this the stops can be altered without the alteration coming into effect until by a touch the current is turned on again. A remarkable feature is the double touch. By means of this the notes on a keyboard sounds the stops belonging to it when pressed down the usual distance. A slightly greater pressure, however, causes, say, the swell keyboard to sound the great organ. By this means remarkable effects can be produced with the utmost ease. The swell-shutter action is electric, and is both prompt and powerful. There are various conjunction pedals, besides a light and a heavy sforzando pedal.

VARIETIES.

THE Maldon Union Rural Sanitary Authority, Essex, at their meeting on May 29, appointed Mr. H. G. Keywood, assistant in the Borough Engineer's Office, Nottingham, as the Surveyor and Inspector of Nuisances, at a salary of 200*l.* per annum. There were seventy-four applications.

THE watch committee of the Tunbridge Wells Town Council have decided that bills or advertisement-boards are not to be allowed to appear on the Pantiles.

A PAPER on "John Dagnia, the Italian glassmaker of South Shields, who died in 1743," was read by the Rev. C. E. Adamson at the last meeting of the Newcastle Society of Antiquaries. The name Dagnia, he said, was a leading one in the Tyneside glass trade in the early part of the eighteenth century. John Dagnia was from 1717 the proprietor of a glass-house, probably at South Shields rather than at Newcastle. There was a tradition that two bevelled panes of plate glass in the garden door of Dagnia's house at Cleadon were the first manufactured in England. Some larch trees in the grounds of the house used also to be pointed out as the first planted in England, the statement being that Dagnia brought fourteen trees from Italy, and that five survived.

THE new school the Mercers' Company are erecting in Barnard's Inn, Holborn, is nearing completion. The quaint old hall of the Inn, which dates from the time of Henry II., is to serve as a dining-hall for the pupils.

AT the Liverpool Town Hall a Local Government Board inquiry has been held with reference to an application by the Corporation of Liverpool to borrow 25,000*l.* for the demolition of insanitary property under the last presentment of the medical

officer of health, by which it is proposed to pull down 578 houses.

FLOUR-MILLS belonging to Messrs. Vernon & Sons, near Uttoxeter, have been destroyed by fire. The damage is estimated at 7,500*l.*

THE death is announced of Mrs. Gray, of Powers Vale, Perthshire, the mother of Lady Millais, at the advanced age of eighty-four. It was from Mrs. Gray's garden that Sir John Millais painted his celebrated picture, *The Vale of Rest*.

THE proposed extension of the Alfred Dock, Birkenhead, with a view to providing additional berth accommodation for large vessels, at an estimated cost of 8,200*l.*, is under consideration by the Dock Board.

THE reservoir at Assouan, as proposed by Mr. Willcocks, C.E., is to be undertaken without delay.

BUILDING AND BUILDERS.

MR. A. B. M'DONALD, the city engineer, has completed the plans for the People's Palace which is to be erected by the Town Council of Glasgow on the Green. It is intended to serve for a museum and gallery of the fine arts and also for a winter garden, in which occasional assemblages of the citizens may be held, floorage accommodation being provided for 3,000 persons. The cost of the works will be about 20,000*l.*

A SANATORIUM is to be erected in Brighton at a cost of over 26,000*l.*, but at first only a part is to be undertaken, which will cost 15,000*l.* A refuse-destructor will also be set up, which will cost at least 14,000*l.*

THE hospital committee of the Liverpool Corporation have adopted plans for an extensive addition to Netherfield Road Hospital. For the land about 7,000*l.* has already been paid, and it is proposed to expend on the new buildings, one of the principal features of which is an isolation ward, about 16,000*l.*

THE chancel of the new church at Avonmouth has just been greatly improved. The wooden steps have been removed, and marble has been substituted. The new steps are the work of Messrs. Arthur Lee & Bros.; they are made of dark Ashburton marble, a beautiful ornamental stone which is quarried in the neighbouring county of Devonshire.

AT the meeting of the Edinburgh Dean of Guild Court there were twenty-seven applications for warrants, of which fourteen were granted. Leave was given to the Edinburgh Merchant Company to effect alterations at the Edinburgh

NOTICE.

Mr. JOHN GRUNDY has purchased the whole of the Valuable Stock and Patents of The Helios and Calorifer Stoves from Mr. H. HEIM, of Vienna and Oxford Street, London, W.

The Premises 95 and 97 Oxford Street will be open until June 24, and Architects and Builders are invited to call, as the stock, which is a very valuable one, will be sold at greatly reduced rates.

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Ladies' College, Queen Street, in the shape of heightening the building towards the back lane, to provide more accommodation for sanitary and other purposes. Warrant was also granted to the Governors of Daniel Stewart's College to construct a hall in the courtyard in front of the building. That courtyard is at present enclosed on one side with a handsome open screen in stonework. It is proposed to roof this over, and thus make a large hall 150 feet long and 45 feet wide. The roof will be of iron, and the hall will be used as a gymnasium and recreation hall. The architects are Messrs. M'Gibbon & Ross.

THE Liverpool City Council have passed amended plans for the new baths at the George's Pierhead, the baths committee being authorised, after the quantities are taken out, to advertise for tenders, to select a contractor for the approval of the Council, and to carry out the work at a cost of not exceeding 60,000/.

NOTES ON NOVELTIES.

MESSRS. WRIGHT SUTCLIFFE & SON, of Halifax, in calling attention to their Sutcliffe's patent "Invincible" automatic water-closet and slop-sink, with self-lifting seat, remark that there are millions of gallons of water wasted every day in the larger cities and towns through leaking valve-cisterns, "weeping" syphons or other closet appliances, and therefore they expect this apparatus to prove a great boon to waterworks companies and others, as all leakages are reduced to a minimum, and by the improved alarm pipe opening, which is constructed so as to make secret waste impossible, there is immunity from carelessness, any leakage being immediately detected and remedied. The improved patented construction of the closet basin and seat is to insure an instantaneous and effectual flush as well as a more comfortable sitting posture than any other arrangement. When the seat is pulled down the ball tap opens and fills the water receptacle. After use the seat resumes its original position, and in doing so flushes the closet with the greatest force, insuring a thorough scouring of every part of the basin and trap. The flushing of the closet is not left to the user, as with the generality of closets, but is worked automatically. It works silently, and is supplied direct from the main, and there is no complicated valve gearing to get out of order, and no overhead cisterns or connections are necessary. It dispenses with the use of ordinary valves and cranks, unsightly pipes, wires, chains, &c. There is no difficulty

in the treatment of the wall surface above closet, as heretofore, with this new apparatus. There is no valve except ball tap, which is under complete control for supplying the charge on each occasion of usage. The construction of this apparatus does not necessitate the interference of waterworks authorities, except for stamping the ball tap. Any pattern of ball tap can be affixed to the supply to suit the various requirements. It is ornamental and compact in appearance, sanitary and simple in construction, economical as to first and after cost, and not liable to be tampered with or to get out of order.

CONTRACTING IN EGYPT.

SOME interest has been excited, says the correspondent of the *Times*, by the result of a law suit brought by Mr. Fell, the well-known tramways contractor, against the Egyptian Government for payment of 29,000/ damages because the Government cancelled, in April 1891, his concession for constructing and working the Cairo tramways and sequestered the 2,000/ which he had deposited as caution money. An important part of Mr. Fell's case was his production of the official authorisation of Sir Colin Scott-Moncrieff, then under-minister of public works, for an extension of the time for beginning the work up to March 19, 1891; also two other letters, dated March 18 and 23, stating that Sir Colin Scott-Moncrieff was satisfied that Mr. Fell had begun the work as stipulated. The Mixed Tribunal refused to admit these letters on the singular ground that the original concession having been signed by the minister, Keki Pasha, Sir Colin Scott-Moncrieff, the under-minister, had no authority to grant any modification. The Tribunal, in its judgment, also alludes to the affidavits of several respectable English manufacturers showing that Mr. Fell had bought rails, carriages, &c., as more or less questionable "contestables."

Surprise has often been expressed that English firms so rarely compete for important engineering contracts in Egypt. This is partly because there is an impression that harder measure is meted out to Englishmen than to natives or subjects of other nationalities when contested points arise, but in a greater degree because English manufacturers show less adaptability than their continental competitors for meeting the exact letter of Egyptian requirements. Mr. Fell's case, having been treated in a manner repugnant to English ideas of fair dealing, will tend to accentuate the aversion of English firms for engineering contracts in Egypt.



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NEW CATALOGUES.

WE have received from Messrs. T. & R. Boote, of the Waterloo Potteries and Patent Tile Works, Burslem, a copy of their new pattern-book of floor and wall-tiling. It contains twenty-eight large sheets of designs, showing in every case the colouring, the harmonising of colours playing an effective part in the design. These sheets contain over 170 different designs, which have been selected out of many that are too numerous to comprise in the compass of any ordinary pattern-book. This is, however, no ordinary catalogue, Messrs. T. & R. Boote having even surpassed their usual high class standard in respect of illustrations, in addition to the fact that the most lifelike—if the expression may be allowed—representations as are possible of tilework on paper are given. Another advantage is that everything has been drawn to scale. Many of the patterns shown are new in treatment and design—for example, all those shown on sheet 104A and sheet 121. It might save time to mention that sheet 121 will not be found to follow sheet 120, for it follows sheet 104A. Other new designs will be found in Nos. 643, 648, 649, 650, 669, 670, 644, 646, 429, 437, 551, 550, 666, 672 and 642. In quoting the Nos. numerical sequence has not been followed. No. 643 will be found on sheet 100 and No. 642 on sheet 116, the other Nos. being found on intermediate sheets. The new patterns showing dados, fittings and frieze, &c., complete, should also be noticed, as being designed with great judgment to give a beautiful enrichment in thorough character with the material.

ART SCHOOL, DOVER.

LADY CRUNDALL, wife of Sir W. G. Crundall, who is now in his sixth year of office as mayor of Dover, laid the foundation stone of a new School of Art, Science and Technology on Monday, June 4. The school is being erected by the Corporation on a site adjoining the Municipal Buildings in Ladywell, which were designed by the late W. Burges, A.R.A., and carried out after his decease. The present school of art accommodation has proved quite inadequate for the increased number of students who gather under the care of Mr. W. H. East, and the Corporation have therefore undertaken the erection of this new block of buildings, which cannot fail to be of advantage to the town. The contract entered into amounts to 10,278*l*. The builder is Mr. W. Bromley, of Dover, and the architect Mr. John S. Chapple, of 7 John Street, Adelphi, W.C.

STRIKES IN CHINA.

THE Shanghai correspondent of the *Standard*, telegraphing to that paper on Monday, says:—The friends of "labour" and the organisers of paralysing strikes at home may be interested to note how their favourite tactics work in less Liberal countries. The young Emperor of China has just had experience of the inconveniences of strikes, and has initiated a drastic mode of discouraging that evil. Many thousands of artisans, including builders' masons, metal-workers, painters and others have been engaged for months past in repairing the Imperial buildings in Peking, in preparation for the Empress-Dowager's birthday celebrations. Latterly, as the time for the work grew shorter, these people caused much trouble by demanding higher pay and refusing to work when their demands were not immediately satisfied. Accordingly Kuang Hsü, a couple of days since, promulgated an edict dwelling upon the trouble caused by these strikes, and commanding his soldiers and police to arrest every workman employed in the Imperial city who shows the slightest disposition to assert the "rights of labour" in a manner likely to cause inconvenience or to retard the work. The edict proceeds to say that all strikers are to be punished without mercy, no leniency to be shown; the more turbulent disturbers to be tried for high treason, the active ringleaders to suffer death by strangulation, while all who follow them are to be banished to the "fever and mosquito regions" for three years. It is reported that very little enthusiasm is noticeable among the strikers now.

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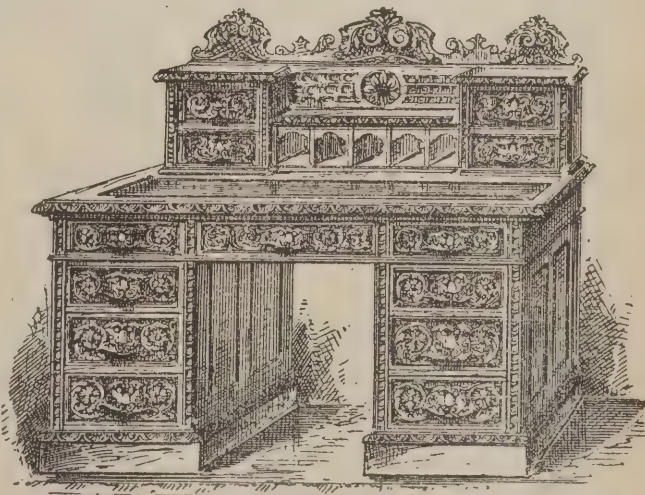
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STREET IMPROVEMENTS AND NEW BUILDINGS IN LIVERPOOL.

THE City Council at its next meeting, says the *Liverpool Courier*, will have to consider some important suggestions as to street improvements. The principal of these are in the centre of the city, adjacent to the Exchange and other busy commercial circles, where it is felt that some of the projected alterations are much needed. Great alterations have been made in these localities of recent years, and if some of the projected street improvements and the construction of new buildings are carried into effect it will help further to enhance the appearance of the city, and be of public utility. There will be submitted to the Council by the health committee, who have the initiatory regulation of these matters, a recommendation that the Council, pursuant to the 66th section of the Towns Improvement Clauses Act 1847, allow, for the purpose of improving the line of Water Street and Fenwick Street, the new buildings for the Bank of Liverpool in such streets to be set forward beyond the building line at the corner of Water Street and Fenwick Street to the extent of 15 square feet on the following terms, viz. that the building line in Fenwick Street be set back, and that two steps in Fenwick Street and one in Lower Castle Street be given up, and the spaces, measuring altogether 65 square feet, be added to the streets; also that the Council consent to the construction of two brick pilasters in the first, second and third storeys above the ground storey of the new offices and warehouses numbered 8 and 10 in Vernon Street, so as to project 4½ inches beyond the building line.

There is also contemplated an improvement by which it is purposed to carry out the gigantic task of pulling down an immense block of property and rebuilding it. This block extends from the Commercial Bank and Yates's Bank in Castle Street down to Parr's Bank in Cook Street, taking in Orange Court and all the intermediate buildings, which will be entirely demolished and new and commodious blocks of offices erected in their stead. A curious feature which is in some way associated with these buildings is that they were, or some of them at any rate, erected by the predecessors of the present firm of Messrs. Jones & Sons, who are now building new premises for Messrs. Leyland & Bullins, bankers, on the opposite side of Castle Street. The firm have also had to do with erecting many other important buildings in Liverpool and district. It is estimated that the value of the block of property and land in question is between 230,000*l.* and 240,000*l.* Several attempts

have been made within the past three or four years to form syndicates to purchase the property, but they have all been unsuccessful, although in some cases contracts were actually signed and deposits paid. Terms of purchase have now been arranged by Messrs. Miller, Peel, Hughes & Rutherford, solicitors, of Cook Street, who have got the trustees of the Osmaston settled estates of the late Sir Andrew Barclay Walker, Bart., to find the money required, about 155,000*l.* The property has been purchased freehold on the basis of a syndicate which has been formed in Birmingham, agreeing to take five leases of the property (it being divided into five blocks), and spending a certain sum of money fixed upon in rebuilding or improving each block. The five blocks are each to be fitted with lifts, &c., and to be built on the most modern and improved principle for offices which will open out into a common staircase in Castle Street. One great advantage of having property built in blocks is that the ground-rent or lease of such, when a matter of 20,000*l.* or so, can be more easily disposed of than would be the case where a sum of 200,000*l.* was involved. Another advantage is that blocks could be insured on better terms against fire. It is a subject of great regret that this matter was not taken up by Liverpool people. One would have thought that in a place like Liverpool there were architects and others of sufficient enterprise to endeavour to grapple with it, but it has been found that this was not the case. Efforts were made in every direction to secure local support, but this was not forthcoming, and it was only when the Birmingham gentlemen forming the syndicate came to the rescue that it was found possible to go on with the alterations. The site will be the largest and most important in point of value of any single site in Liverpool for office purposes. The improvements in Castle Street of recent years have been of an important nature, and, as in the case of Lombard Street, London, the shops are being gradually eliminated, and it is becoming the habitat of some of the principal banks in the city, the Bank of England, the Adelphi, Leyland & Bullin, Yates & Co., the North and South Wales and other financial houses having their abodes there now.

The purchase of the property in question was completed a fortnight ago, and the whole of the purchase-money has been paid over, the price of the land being as near as possible 50*l.* per yard, certainly not an excessive price when it is remembered what a splendid frontage the property has to Castle Street and Cook Street. A suggestion has been made that the Law Association should join the gentlemen who are about to rebuild

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this property, with the object of securing an entrance to their rooms by means of the staircase of one of the new blocks, and the matter is now under consideration. The tenancies of the property are all exceedingly short, and the occupiers have expressed their willingness to meet the views of the builders. The present intention is that the back portions of the property will first be pulled down and rebuilt, so that the tenants of the succeeding portions to be demolished will be able to be accommodated in the new buildings.

One fact which ought not to be lost sight of at this juncture is that the Corporation have now an admirable opportunity of effecting the much-needed widening of Cook Street, and that without having to pay an exorbitant price. Whenever this subject has been broached in the past the rebuilding of the property has stared them in the face, but now the Corporation have an opportunity of doing the work for the mere price of the land, and should they allow it to slip there is no telling when they will again have such a chance.

The syndicate will lease the blocks for a period of ninety-nine years, and while not paying anything for the land will erect the blocks of offices, paying the trustees of the late Sir A. B. Walker's estates 4 per cent. on the 155,000*l.* laid out by them. This system is said to be a entirely new one in business relations in Liverpool, though it has been carried out with advantage in London, Manchester, Birmingham and other places for a good number of years. It simply means that a capitalist can find money for the purchase out and out of a large piece of land and not have the responsibility of rebuilding the property or looking after the tenants, while at the same time he gets a safe and small return for his money. The only matter which now remains to be done in connection with the scheme is giving the tenants notice to quit.

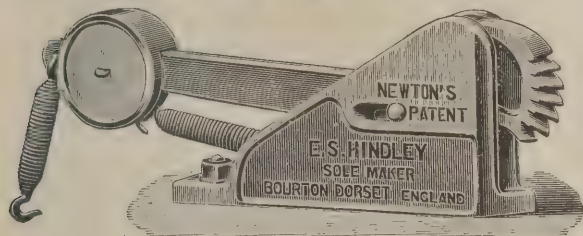
At the meeting of the Bridlington Local Board it was decided, on the recommendation of the building and lighting committee, to light up the sea front from the north end of the Prince's Parade to the north end of the Beaconsfield Sea Wall by electricity, at an estimated cost of 275*l.* The Prince's Parade has been lighted by electricity for the past three seasons, and it has proved such a success that the Board have determined to extend this mode of lighting. Seven arc lamps of 2,000 candle-power each will be used, and supplied from the Board's station on the Prince's Parade

EGYPTIAN OBELISKS.

MUCH learning and research have been expended by Zoëga and others in endeavouring to ascertain the origin of obelisks, yet without throwing any very satisfactory light on that part of the question. Antiquaries have in fact endeavoured to find positive evidence where none was to be obtained, for the case itself is not, like that of a particular invention or discovery, referable to some precise period or nation. On the contrary, from the very earliest ages it had been the practice to mark some particular spot, the scene of some important event, by what might serve as a durable monument of it; nor would anything more naturally suggest itself for such purpose than fixing in an upright position a stone of unusual dimensions. The Bible makes mention of this practice, and it prevailed not only in the East and in the early ages of the world, but has prevailed among nearly all nations either in a savage state or in an early stage of civilisation. Among the Egyptians, therefore, the practice was not otherwise very remarkable than on account of their continuing it, and bringing such simple primeval monuments to great perfection, making them of stupendous dimensions, working them in the most elaborate manner, and adorning them with hieroglyphics, though not indeed invariably, for there are instances of Egyptian obelisks which are not so sculptured; among others that in front of St. Peter's, at Rome, and the one before the church of Santa Maria Maggiore.

Small obelisks were sometimes of sandstone or granite, but the larger Egyptian obelisks are all of the red granite of Syene, and it is certainly astonishing how such enormous masses of that material could be quarried out and afterwards removed and placed in their position. We may conjecture that the Egyptians detached the large masses of rock for their obelisks somewhat in the same way that was adopted by the natives of India on the occasion of raising the great granite obelisk at Seringapatam in the year 1805. In this instance a groove about 2 inches wide and deep was chiselled out by the workmen in the line where it was required to separate the stone which being done, a fire was kindled upon it from end to end and kept up until the stone was sufficiently heated, when the embers were blown off, and cold water poured into the groove, whereby a clear fracture in the stone was made without further labour. Indeed, the mode in which the Egyptians worked their quarries is

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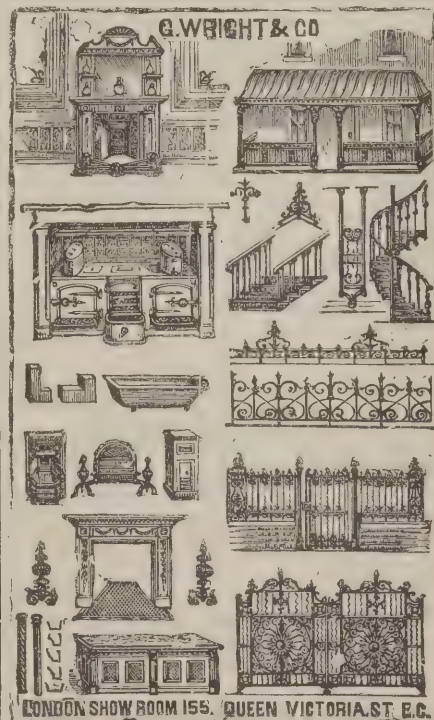
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clear enough at the present day from an inspection of the excavations. Among the Egyptians, when the block had been thus hewn out of the quarry it was conveyed away by a raft on a canal brought up to the very edge of the rock, either at the time of the inundation, when the water would rise to a sufficient level, or by lowering the block down an inclined plane or platform to the raft, or by digging a canal from the river to the site of the block and bringing a boat under the obelisk, in the manner described by Pliny. The granite block was afterwards polished, and probably raised in the same way as the Seringapatam obelisk, by means of banks of earth.

For raising the obelisk before St. Peter's (supposed to be that brought from Heliopolis by Caligula) no fewer than five hundred different projects were submitted by architects and engineers to the pope Sixtus V., and Domenico Fontana was thought to have accomplished little short of a miracle in rearing it by means of very complex machinery and several hundreds of workmen and horses. The process by which the Lateran obelisk was originally erected at Rome seems to have been equally complicated and laborious. How the Egyptians raised such masses of granite is not known, but probably by a much simpler mode, whether similar or not to that practised in elevating upon its pedestal the one at Seringapatam. According to Colonel Wilks's account of the operations this obelisk, a single stone about sixty feet long and six square at its base, was placed horizontally upon a mound or platform of earth, secured by strong walls and level with the top of the pedestal, the base of the obelisk being placed just on the ledge of the pedestal. The shaft having been laid on planks or timber poles, these served as fulcra, by means of which the smaller end or top was gradually raised, wedges were put under it and earth rammed in, which was repeated until the platform became an inclined plane as steep as it could with safety be carried up. The shaft being got thus far out of its horizontal position towards a perpendicular one, ropes were then applied, worked from a strong timber scaffold nearly as high as the obelisk itself and enclosing the other three sides of the pedestal, other ropes being also employed in a contrary direction in order to check its coming down on the pedestal with too sudden a shock.

By the Egyptians themselves obelisks do not appear to have been raised as insulated monuments or single objects, but as the accompaniments to temples and palaces, where they were placed in pairs, that is, one on each side of a large entrance, or *propylea*, and it may therefore be inferred that some particular

signification was attached to them. They were also sometimes placed in the interior courts of temples. With respect to their proportions, the shafts of obelisks were usually about ten diameters in height, and one-fourth narrower at top than at their base. The pyramidion, or apex, was made much more pointed in some obelisks than in others. One singularity is that few Egyptian obelisks are perfectly square, two of their sides being generally somewhat broader than the other two, which may be accounted for by what has just been said, namely, that they were placed against buildings, and not intended to be insulated objects viewed from every direction. The face of an obelisk is sometimes slightly convex, instead of being quite plain, as is the case with one side of the Lateran obelisk.

The number of obelisks in Egypt must have been at one time very considerable, yet we are not therefore to suppose that the erection of them was a frequent circumstance, since, once formed, they were almost imperishable, and would therefore greatly increase in the course of ages. Many that are still remaining are no longer standing, and in some places several have been found on the same spot, some still standing, others lying on the ground. When the Romans became masters of Egypt they removed many of these monuments to their own capital, among others that of the Lateran, which is the largest now known, its shaft being 105 feet (although it has been reduced, a portion at the lower part having been cut off in consequence of being fractured), and two of its sides 9 feet 8½ inches, the other two 9 feet. This obelisk was first conveyed from Heliopolis to Alexandria by Constantine, and by that emperor's son Constantius brought from the latter city to Rome, where it was erected in the Circus Maximus. The shaft of the Lateran obelisk weighs about 445 tons in round numbers. Augustus also had previously brought two from Heliopolis. That which was originally placed in the Vatican Circus by Caligula, and now stands in the piazza of St. Peter's, is next in size to that of the Lateran, though supposed to have been somewhat abridged of its original dimensions. The entire height, including the pedestal and the ornament at top, is about 132 feet; the shaft itself is 83 feet, and 8 feet 10 inches square at its base and 5 feet 11 inches at the other end. In the At-Meidan at Constantinople there is an obelisk about 50 feet high, said to have been erected by the emperor Theodosius.

During the calamities that befel Rome under its barbarian invaders after the downfall of the empire, the obelisks were damaged and overthrown, but they have been gradually restored under various pontiffs.



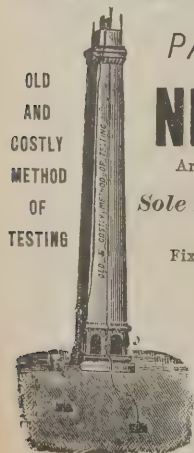
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THE INSTITUTION OF CIVIL ENGINEERS.

THE annual report of the Council of the Institution of Civil Engineers shows an effective increase of 188 additions on the previous total of 5,371—or at the rate of $3\frac{1}{2}$ per cent. per annum—while as regards the students, the decrease is 28. The gross numbers on the books on March 31 in 1893 and in 1894 were 6,397 and 6,557 respectively.

The strict income amounted to 21,308*l.* 12*s.* 3*d.*, an increase of about 45*o*l. on the former year, to which had to be added 3,838*l.* 16*s.* on account of capital and 428*l.* 14*s.* 6*d.* for trust funds, bringing up the total receipts to 25,576*l.* 2*s.* 9*d.* The general expenditure had been 17,489*l.* 3*s.* 10*d.* (including 8,050*l.* for publications), while there had been an expenditure of 5,166*l.* 1*s.* 2*d.* on capital account and 10,000*l.* had been placed on deposit to meet the considerable sums which would be required at an early date in connection with the new building. The summary of investments showed that there stood to the credit of the Institution 118,067*l.*, with trust funds of the par value of 15,606*l.* 0*s.* 10*d.*, together 133,673*l.* 0*s.* 10*d.*

During the past session nineteen papers had been read and discussed at the ordinary meetings, treating of separate and clearly defined branches of engineering—municipal, hydraulic, mechanical, mining and electrical, and also referring to naval architecture. For several of the papers detailed premiums had been awarded to Messrs. Clerke, Kreuter, Vernon-Harcourt, Partiot, Greathead, Fox, Parker, Hunt, Redwood, Commans and Colquhoun. The papers selected for printing without being read had been numerous and varied, and had ranged over the whole field of modern engineering. Mention was made of several representative memoirs in the various branches, not that they merited greater recognition than the others, but that they served to support the quality of catholicity claimed for the Institution. Premiums for papers in this category had been awarded to Messrs. Donkin, Lowcock, Marks, Tanabe, Ewart and Moncrieff.

The second of the "James Forrest" lectures had been delivered by Dr. John Hopkinson, F.R.S., M.Inst.C.E., his theme being "The Relation of Mathematics to Engineering." This recondite subject had been presented to a large audience, which testified in a marked manner its appreciation of the lecture.

Eleven supplemental meetings for students had been held. The papers read afforded evidence of having been carefully prepared, and three of them were considered sufficiently good to merit the distinction of being printed in the minutes of proceedings. The proceedings of the local associations of students at Manchester, Glasgow, Birmingham and Newcastle-on-Tyne had been highly satisfactory, and the Council was glad to report that a fifth local association had been formed at Leeds. For papers read by students at the Institution, and before the local associations, the Council had made the following awards:—The Miller scholarship (tenable for two years) to Mr. L. H. Appleby, and Miller prizes to Messrs. A. R. Gale, W. Beer, W. G. Wales, H. T. White, P. J. Tucker, H. N. Allott, A. Watson, W. O. Leitch and T. H. Watt.

At the Engineering Congress at Chicago, alluded to in the last report, the Institution had been represented by Sir Benjamin Baker, K.C.M.G. An address, thanking the Institution for its action in the matter, had been subsequently received from the executive committee of the Congress. The Council was of opinion that to preserve and strengthen the cordial relation which subsisted between the engineers of Great Britain and of the United States was a high object, for the attainment of which in the present case the thanks of the Institution were due to its delegate.

The laborious work of preparing for press the library catalogue had been completed. A large portion of the matter was already in print. The sheets of the first volume had been struck off, and a bound copy was laid on the table for the inspection of the members.

In conclusion, the Council stated they had devoted much attention to the question of rebuilding the premises. A decision had been arrived at to utilise the sites of Nos. 24, 25 and 26 Great George Street, and designs for a new building had been prepared by Mr. Charles Barry, F.R.I.B.A. It was hoped that the work might be commenced early in the forthcoming recess.

The ballot for Council resulted in the election of Sir Robert Rawlinson, K.C.B., as president; of Sir B. Baker, K.C.M.G., Mr. J. W. Barry, Mr. W. H. Preece, C.B., and Sir Douglas Fox as vice-presidents; and of Dr. W. Anderson, A. R. Binnie, W. R. Galbraith, J. H. Greathead, Sir Chas. A. Hartley, K.C.M.G., J. C. Hawkshaw, C. Hawksley, Dr. Alex. B. W. Kennedy, Sir Bradford Leslie, K.C.I.E., J. Mansergh, Sir Guilford Molesworth, K.C.I.E., Sir E. J. Reed, K.C.B., W. Shelford, F. W. Webb and Dr. W. H. White, C.B., as other members of Council.

POWER DISTRIBUTION BY ELECTRICITY, WATER AND GAS.*

FOR some time past the author has been struck by the great discrepancy between theory and practice that must exist in the working of electric generating plant in central supply stations where steam is used. Observation and experience alike have served to accentuate the inefficiency of electric generating plant, and some rough comparisons made with other modes of producing and distributing power have led him to go into the matter more carefully, and when invited by Mr. Worby-Beaumont to contribute a paper to your Society, he not only felt honoured at such a request, but was glad of an opportunity of bringing this matter before engineers for discussion. Such a subject as the distribution of power admits of practically endless elaboration. Moreover, nothing can be gained by generalisations from the results of existing or proposed distributing systems. The proper value of each system is entirely conditioned by the initial form in which energy is available, and by the final form in which it is required.

As one of the most important developments of modern engineering lies in the application of electrical energy to lighting, this latter will be considered as the final required form of energy, and coal will be taken as the initial form in which energy is available. These conditions apply to nearly all large towns.

In the following lines the author proposes briefly to consider:—1. The efficiency of electric-generating plant in central stations at the present day. 2. The efficiency of power-producing plant in hydraulic power stations. 3. The efficiency of gas-engines for production of power.

The definitions of efficiency are probably more numerous even than those of "load factor," and no doubt the ingenuity of that class of investigator which seeks to make a labour of investigation is not yet exhausted in the direction of finding out new possible ratios; but in such a paper as this, which is designed more to suggest a line for discussion than to deal with any discoveries or startling novelties, it is well to briefly consider which definition of efficiency is best calculated to serve the purpose of this paper.

The efficiency with which the practical engineer has to deal may be expressed—perhaps with brutal matter of factness—as the ratio of what you get to what you pay for. But while such definition expresses the main value of a combination of machines commercially, it is not a convenient ratio for comparison with other similar ratios, because the introduction of market value at once destroys the possibility of bringing each fraction to a common denominator. As the motors that will be considered to-night are all heat machines, the author proposes to base his comparisons upon the ratio of the thermal equivalent of useful work available for commercial purposes to the calorific value of the fuel burnt per hour. Such considerations as the cost of fuel can easily be applied after.

This definition, however, is open to the objection that it is not fair. It may be argued that if a heat machine of necessity rejects a large proportion of the heat it receives, it is not just to calculate an estimate of efficiency upon a basis which is impossible of realisation, and that the efficiency should be expressed by the ratio of useful work to maximum possible useful work in that class of heat machine. The author would submit that while such a contention bears the semblance of justification, it should be borne in mind (1) that the fact of a machine necessarily rejecting a large proportion of the heat received cannot be pleaded as a valid reason why such a proportion of heat should be rendered unavailable, (2) that the definition adopted by the author gives an absolute basis for comparison, (3) that as long as the meaning attached to the word efficiency is quite clearly understood, it can make no difference to the argument if the actual, instead of the ratio of the actual to maximum theoretical efficiency is used, (4) that the latter is merely one of the very numerous definitions of efficiency.

A steam-engine is usually accounted an extremely wasteful heat machine, but this is, strictly speaking, not the case.

The only way to increase the efficiency of the steam-engine is by lowering the lower limit of temperature, but directly efforts are made in this direction a limit is soon reached beyond which further lowering of the temperature not only ceases to be productive of any good, but is productive of evil. In short, it may be said that all the heat developed in the combustion of fuel is utilised by the steam-engine, either in doing work or in providing the means of doing work or controlling the rate at which work is done.

The efficiency of the steam-engine and boiler combined is not difficult to determine; it is the ratio of the thermal value of the brake horse-power hour to the calorific value of the fuel consumed per brake horse-power hour.

* A paper by Mr. Ed. C. de Segundo, read at a meeting of the Society of Engineers on June 4.

The efficiency of the gas-engine and its equivalent of steam-boiler requires some investigation.

A ton of coal, according to Mr. Emerson Dowson, may be taken to produce 9,500 cubic feet of gas and 1,500 lbs. of coke, of which about 400 lbs. will be consumed under the retort. Assuming that coal having a calorific value of 14,000 thermal units per lb. is used, and taking the calorific value of coke at 10,000 thermal units, the number of thermal units liberated from the ton of coal is (neglecting heat necessary to raise the mass of coal to the temperature of the retort),

$2,240 \times 14,000 - 1,500 \times 10,000$, or 16,360,000 thermal units. Of the heat developed by the consumption of the coke under the retort a large proportion can never be expected to reappear in the gas. But 16,360,000 thermal units have actually disappeared in producing 9,500 cubic feet of gas; hence $\frac{16,360,000}{9,500}$, or 1,722 thermal units, should be accounted for per cubic foot of gas.

Professor Kennedy, Professor Unwin and others have made calculations of the calorific value of a cubic foot of gas, the results of which agree fairly. The average calorific value of London gas may be taken as 620 thermal units per cubic foot at 55 deg. Fahr., and at a pressure of 14.7 lbs. per square inch; hence the efficiency of the gas-generator is $\frac{620}{1,722}$ = about 35 per cent.

The function of a steam boiler is in the case of a gas-engine split up into two, one portion is done at the gasworks and the remainder in the cylinder of the engine itself. Now about 24 per cent. of the heat given to a gas-engine is turned into indicated power, or in the case of a large-size engine about 20 per cent. is converted into brake horse-power. Hence the real efficiency of the gas-engine and boiler, so to speak, is about 7 per cent. The efficiency of a non-condensing steam-engine consuming 2 lbs. of coal of a calorific value of 14,500 thermal units, and working at 80 per cent. mechanical efficiency, is 8.72 per cent., so that the total efficiency of one machine is very much the same as that of the other on this basis of argument.

But Mr. Dowson claims to produce one brake horse-power hour for 1 lb. of anthracite by using his generator gas. This (taking the calorific value of anthracite at 16,000 thermal units per lb.) would correspond to a total efficiency of nearly 20 per cent., an efficiency which the steam-engine and boiler can never hope to reach.

Although the author desires to consider the two heat machines on the basis of what may be termed the useful efficiency, namely, the ratio of available power or brake power to power equivalent of fuel burnt, still, in the face of so great a difference as the foregoing, it may be of interest to inquire into the reason of the difference, and to do this it is necessary to consider another efficiency, namely, the ratio of heat turned into work in the cylinder, to the maximum theoretically possible. This latter quality is expressed by Carnot's Law as the ratio of the difference of temperature at which heat is received and rejected to the absolute temperature at which the heat is received. In the case of the steam-engine this ratio is not difficult to determine, because the heat is all received at one temperature and rejected at one temperature. But in the case of the gas-engine this is not so. As mentioned before, part of the function of the boiler, or part of the operation of calling into existence the working fluid whereby heat energy may be transformed into mechanical energy, is performed in the cylinder of the engine itself. This operation cannot be instantaneous, in obedience to physical laws, therefore the heat is received during an appreciable interval of time and at temperatures varying from the temperature of the mixture and the end of compression to the maximum temperature reached by the charge after explosion. In some parts of the cylinder this temperature may, according to Mr. Clerk, be as high as 3,400 deg. Fahr. It would appear, however, that most authorities agree upon 2,700 deg. Fahr. as about the maximum temperature reached by the charge in gas-engines of all forms.

The temperature of the discharged products is not far short of 800 deg. Fahr., though of course the heat rejected is not rejected at one temperature. Hence the maximum efficiency attainable should be $\frac{2,700 - 800}{3,160} = \frac{1,900}{3,160}$ = 60 per cent.

The efficiency of the non-condensing steam-engine cylinder under an admission pressure of 130 lbs. per square inch, and an exhaust pressure of 20 lbs. per square inch would be about 18 per cent. Therefore if this steam-engine turns 8 per cent. of the heat into work, it is doing as well relatively to its peculiar limitations as the gas-engine that turns 26 per cent. of the total heat received into work.

The greater useful efficiency of the gas-engine therefore must be ascribed to the nature of the vehicle used for carrying the heat, and not to the superiority of the gas-engine as a heat machine.

It is not within the scope of this paper to even suggest any

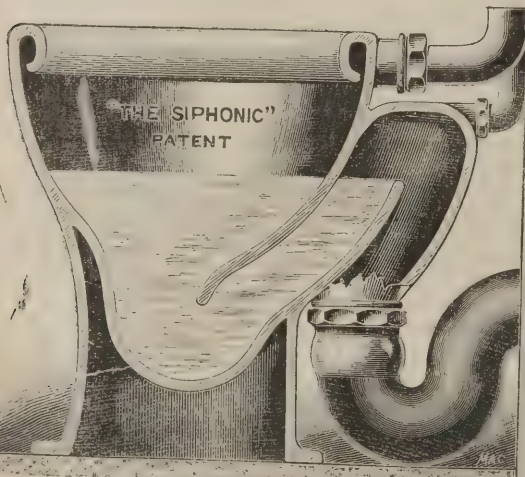
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direction in which the efficiency of the gas-engine might be enhanced, but it is obvious that if the link could be forged between the now disconnected heat chain in the gas-engine cycle, whereby the heat carried away in keeping down the temperature of the cylinder could be usefully expended in some other part of the cycle, the time would not be far distant that Sir Frederick Bramwell has spoken of, when all that remains of the steam-engine would be a working model or two in some obscure museum.

Let us now consider an electric generating plant using steam power.

Tests of various portions of electric generating plant are continually being published which, if they are any criterion of what may be attained in practice, would point to an extremely high efficiency of a generating station as a whole. Any dynamo manufacturer would be much insulted if one were to suggest that his 30 kilowatt machine would not yield a commercial efficiency of over 90 per cent. at anything like full load. The makers of high speed, non-compound, non-condensing engines claim a mechanical efficiency of something like 90 per cent. with a steam-consumption of 18 lbs. 1 horse-power hour, or 20 lbs. per brake horse-power hour, and moreover they are always prepared to prove it.

Only a few weeks ago Messrs. Siemens published an account of a test of a steam dynamo driven by a Willans engine, which resulted in a combined efficiency of 88 per cent. It is also possible to obtain boilers which will evaporate over 12 lbs. of water from, and at 212 deg. Fahr., per lb. of good coal. Now it may be interesting to compare the best possible results based upon such efficiencies. Take a pound of coal whose calorific value is, say, 14,500 thermal units. The author is given to understand that certain boilers in one of the electric generating stations in London evaporate 12.8 lbs. of water from, and at 212 deg., per lb. of coal. This would correspond to an efficiency of about 75 per cent. Allowing 30 per cent. for loss in transmission and radiation, and 13 per cent. as the highest thermal efficiency of a non-condensing, high-speed steam-engine using 18 lbs. of water per indicated horse-power hour, this would leave 1,372 thermal units turned into work in the cylinder of the engine.

Taking 88 per cent. as the efficiency at which a steam dynamo was recently described to be capable of working, 1,207 thermal units, or nearly 350 watt hours should reappear at the dynamo terminals, and subtracting 10 per cent. for loss in distribution, 315 watt hours should be paid for by the consumer per lb. of coal burnt at the station. This is equivalent to a consumption $\frac{1,000}{350} = 2.86$ lbs. of coal per unit delivered.

Were a full load to be maintained at a generating station, this result is what should be realised if the efficiencies claimed for the various factors are trustworthy. But nothing approaching this figure is attained in central station work, and the whole of the discrepancy is attributable to the influence of a load factor. In all, eight definitions have been given of the term load factor. In the considerations under review the author takes the following definition, namely, the ratio of total output to safe maximum output for which the plant is designed. It will be interesting to compare existing practice with the result obtained by assuming efficiencies, &c., which may be reasonably considered to accompany the working of a plant under the ordinary working conditions in England.

In a modern generating station the sizes of the generating units should be so proportioned and the general arrangements so designed as to enable a careful man to keep the load on those of his units which are running at a minimum of from 50 to 60 per cent. of full load. This means that on the average the units in work will run at something considerably over half load. From calculations based on the results of actual practice the author has arrived at 9.5 per cent. as the ratio of thermal equivalent of watts at the dynamo terminals to heat contained in steam supplied which should obtain in a well-regulated central station under ordinary conditions of working in England.

Taking, as before, 1 lb. of coal of a calorific value of 14,500 thermal units, allowing a boiler efficiency of 70 per cent., 10 per cent. stand-by losses, 9.5 per cent. efficiency of steam dynamo and 10 per cent. loss in distribution, not more than about 4.4 lbs. of coal should be consumed per kilowatt hour, delivered to consumer's terminals.

But this figure is not approached in practice, except in one instance by Mr. R. E. Crompton, who states that at Kensington Court he burns 5.5 lbs. of coal per kilowatt hour delivered all the year round; but he states that in doing this he forces his boilers, although it is not easy to appreciate the exact meaning of forcing a boiler. Certainly, forcing a boiler usually results in a greater evaporation at a greater consumption per lb. of water evaporated, as it is well known that a boiler works most economically at about three-quarter load.

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but not approaching the figure above arrived at. M. Druitt Halpin stated, in the course of some remarks at Nottingham last year, that an analysis of the Board of Trade returns of electric-light companies showed an evaporation per lb. of coal of only 4 lbs. of water in the best example and of 1 or less than 1 in the worst. This anomaly is difficult to account for; it is usually ascribed to a low load factor, but this hardly seems reasonable.

Take, for instance, the working of a station of the London Hydraulic Power Company. The plant consists of boilers, engines and pumps combined, and accumulators which in practice only act as equalisers. The efficiency of the boilers, the stand-by losses and the loss by radiation will be about the same as in the case of an electric generating plant, at least, there is no reason why they should be different. But the engines will probably be more economical because, although they run at a diminished speed where the demand on the mains is small, they always work at full load per revolution. Of course the engine efficiency is not quite so good at slow speed as at high, but even at a slow speed an engine working at full load per revolution must compare favourably with one doing the same total work in horse-power hours at double or three times the speed. Moreover, at an hydraulic power station it is generally practicable to use triple expansion condensing engines.

As the thermal efficiency of steam-engines, under such working conditions as obtained in central power producing stations, is extremely difficult to determine with any accuracy, it may be of interest to arrive at their figure by calculation of other efficiencies as nearly as they can be estimated.

Probably 9 lbs. of coal of calorific value of 14,500 thermal units per lb. is not an excessive figure to assume as the average performance of London central electric stations per kilowatt hour, paid for by the consumer.

Now one kilowatt hour is equal to about 3,420 thermal units. Adding 11 per cent. for loss in distribution, and allowing 1.25 as the counter efficiency of the dynamo, there should appear on the crank shaft of the engine, so to speak, the equivalent of about 4,750 thermal units. But to effect this 9 lbs. of coal have been burnt, liberating $14,500 \times 9 = 130,500$ thermal units, so that the efficiency or non-efficiency of working of boiler and engine together with attendant stand-by and radiation losses are responsible for 96.2 per cent. of the heat energy of the coal consumed.

Of course the engine and boiler as heat machines are not to be held accountable for the whole of this loss. It is mainly due to the conditions of working. But the question that naturally suggests itself under these circumstances is, is there no other and more efficient manner of generating and distributing light and power on an intermitting demand than by steam power, generating electrical energy and distributing it by means of copper mains?

It must not be forgotten that the coal consumption is by no means the only factor to be considered. Rents, rates and taxes, maintenances and distribution expenses, depreciation, management expenses, and a host of other items, have to be tacked on to the cost of coal consumed before the figure is reached from which profits can be calculated. But even on this basis the total for power delivered is strikingly smaller in the case of hydraulic power supply than in that of electric supply.

In a recent paper read before the Institution of Civil Engineers by Mr. E. B. Ellington, it was stated that the total cost per 1,000 gallons delivered at 700 lbs. per square inch was 12s. 6d. Now 1,000 gallons at 700 lbs. per square inch is equivalent to 8.34 horse-power hours or 6.25 kilowatt hours nearly. There is no Electric Supply Company in London who deliver one kilowatt hour at a less total cost than from 3.5 to 4.5d. to themselves. Thus the cost per equivalent of one kilowatt hour is rather more than double in the case of electric supply than in the case of hydraulic supply. The question is, as to whether this economy can be ascribed wholly to the superior economy of the steam-engine in all hydraulic power stations, having regard to the fact that not only is the hydraulic load curve similar in form to the electric load curve, but the load factors in both cases are similar. The author thinks not entirely, as a certain proportion of this economy must be due to the difference in the inevitable losses in the system of distribution, and also to the difference in capital outlay for large powers.

In comparing distribution of power by high-pressure water and by electricity, due consideration must be had to the purposes to which power is to be put. For working lifts or cranes or presses, it is doubtful whether any simpler and better means could be provided in a city like London than water-pressure. If, on the other hand, the form in which the power is delivered has to be changed before it can be applied, it is quite possible that the efficiency of transformation may be so low as to dissipate the economy attained in generation and distribution. Compare, for instance, the number of transformations necessary

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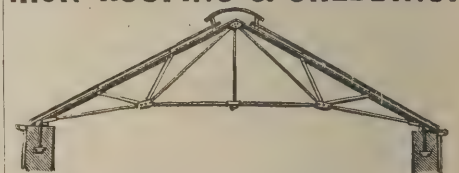
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On the hydraulic system about 620 thermal units should reappear in useful work and on the electric system about 650 thermal units.

The foregoing assumptions are not made with regard to any particular load factor, but as the load factor is found to be very similar in public electric supply stations and public hydraulic supply stations, the conclusions indicated by the figures should not be materially altered. There is of course nothing very new about this result, but it is sufficiently striking to have induced a Belgian engineer of considerable reputation to devote a large amount of time to the development of a system of hydraulic distribution in generating electrical energy which should enable electrical energy to be sold at considerably cheaper rates than at present.

It is unnecessary to discuss M. Van Rysselbergh's scheme in detail. It is evident that the only directions in which the efficiency of a system as a whole can be increased are (1) by decreasing the number of transformations of energy, and (2) by increasing the efficiency of either or all of these.

Now the number of transformations of energy is not

decreased but increased in the hydraulic system. The efficiency of boilers and dynamos cannot be very different in both systems. The difference in the cost of the distributing system is conditioned by circumstances; there remain then two efficiencies to be improved on, the efficiency of the engine and the efficiency of the distributing system.

The economy effected by a triple expansion condensing engine working as it does in an hydraulic power station at full load per stroke, over the steam engines forming part of the "steam dynamos," now much used in electric generating stations, might well reach 50 per cent.—that is to say, where the steam engine of the steam dynamo gives 10 per cent, the triple compound as above might yield 15 per cent. The loss in a mile of hydraulic main, say 6.5 inches diameter, when transmitting 100 horse-power at 700 lbs. per square inch at a velocity not exceeding 3 feet per second, would not greatly exceed 1 per cent., whereas the average loss in an electric distributing system rarely is less than 12 per cent., though doubtless this could be improved upon.

Against these sources of economy must be placed the loss in the water motor, the loss in the extra transformation of motive power into electric light, and the loss in the low-tension network surrounding each distributing station. Further, hydraulic mains have to be placed at a considerably lower level than the electric conduits need be for many reasons, and it can scarcely be even a matter of doubt that the total commercial efficiency of the whole hydro-electric system, by which is meant the useful efficiency modified by all such considerations as rents, rates and taxes, maintenance and depreciation, &c., will compare unfavourably with the total commercial efficiency of direct electric supply.

There can be no doubt, however, that power can be produced and delivered hydraulically at a smaller cost than the electrical equivalent electrically. There must be a reason for this, and the reason is not far to seek. In the hydraulic power station a more efficient engine can generally be used; then this engine can be worked more efficiently owing to the fact that although the engine may vary in speed, it works always at full load to the stroke. There can be further a much greater efficiency in distribution through pipes. In hydraulic power supply the pressure is not a function of the speed of the pump (as in direct electric supply it is a function of the speed of the armature), but the pressure in the mains is maintained outside of the engine and pump, which only deliver enough water at a constant pressure to supply the demand on the mains.

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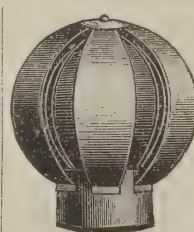
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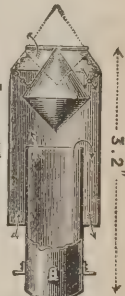
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At first sight it seems easy to apply this principle to electric supply by the introduction of an electric accumulator or storage battery to keep up the pressure on the mains. But unfortunately the analogy between an hydraulic and an electric accumulator is not quite complete; it breaks down in one important detail, namely, that while the hydraulic accumulator reacts in the same way upon both main and pump, the electric accumulator only acts in an analogous manner towards the main. Its effect upon the dynamo or electric pump is to drive the pump unless the pump is driven sufficiently quickly. What is wanted to complete the analogy is the analogue of the non-return valve, and this so far has not been discovered. Moreover, while pressure can be exerted by a pump, whose plunger is stationary, the pressure exerted by the electrical pump or dynamo is a function of the speed of rotation of the armature. Thus in order to supply a small demand the steam-engine of an electric generating station has to work at about 90 per cent. of the speed required to supply the full demand.

There is no reason why an electrical generating station should not be able, provided the demand is sufficiently large and varied, to so apportion its generating units as to keep each unit in work loaded to 90 per cent. of its full load, in which case the only losses in the station would be 10 per cent. stand-by in boilers, radiation, &c. In the Berlin central station, where, owing to Continental habits of life, the demand is more favourably distributed over the twenty-four hours, such a condition is very nearly approached.

(To be concluded.)

DUMBARTON CASTLE.

RECENTLY, while a flower plot was being formed on a bank a little behind the old Governor's House, now occupied as the barracks of the four or five men who form the whole garrison of this Union fortress, Mr. Roberts, who was at work there, was surprised by striking against a large stone; he endeavoured to lift it, but it slipped from his hands and fell into what was evidently a large cavity. Major Martin, Royal Engineers, communicated at once with the Glasgow Archaeological Society, and the hon. secretaries visited the castle. They found on examination that there were no traces of an underground passage, but that the cavity unexpectedly brought to light was a large cistern about 15 feet long, 9 feet high and

8 feet wide, having a dwarf division wall in the middle, with an arched opening in the lower part of it. It is curious that there appears to be no local tradition of any such cistern, although it is evidently of comparatively recent construction, not dating back probably more than seventy or eighty years.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C. from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9820. Harry Hirst, for "Improvements in the method of decorating and fixing glass panels."

9842. Alfred Gough, for "Improvements in roller-blind pulleys."

9858. William Bewick Quelch, for "Improvements in and connected with sash windows."

9860. Frederick William Goldby, for "A process for producing pressed glass plates for lining walls, ceilings and for similar purposes."

9893. Alfred Purkess, for "A combined fanlight-opener stay and fastener."

9923. John Hastwell & Son, for "An improved window-sash fastener and ventilator combined."

9954. Edward Cook, for "A combined lock and safety drop-latch."

9969. Alfred Julius Boulton, for "Improvements in portable water-closet apparatus or commodes."

10015. William Meakin, for "Improvements in the construction of apparatus for raising, lowering and securing sliding window-sashes."

10062. Thomas Carpenter Dowd, for "Window and door fasteners."

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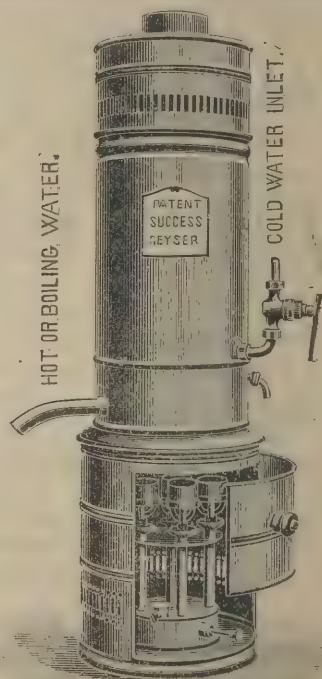
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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CONTRACTS OPEN.

BARRY.—June 18.—For Construction of Dock (20 Acres) and Works in Connection. Mr. John Wolfe Barry, Engineer, 21 Delahay Street, Westminster.

BATLEY.—June 16.—For Additions to Working Men's Club Buildings. Mr. Walter Hanstock, Architect, Branch Road, Batley.

BELFAST.—June 15.—For Enlarging St. John's Church National Schools, Whitehouse. Mr. Samuel P. Close, Architect, 53 Waring Street, Belfast.

BIDEFORD.—June 18.—Grand Stand, Horse Boxes, Bandstands, &c. Mr. T. A. Fogarty, Secretary to the Bideford Horse Show Committee.

BIRKENHEAD.—June 19.—For Alterations to Laird School. Mr. C. Brownridge, Borough Engineer, Town Hall, Birkenhead.

BOROUGHBRIDGE.—June 18.—For Building Police Station. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

BRECON.—June 23.—For Erection of a Strong Room. Mr. H. Edgar Thomas, County Hall, Brecon.

BROMLEY.—June 26.—For Fittings to the Free Public Library. Messrs. Potts, Son & Hennings, 1 Furnival's Inn, E.C.

BURNCULLOW.—June 26.—For Construction of Railway Station, &c. Mr. G. K. Mills, Secretary, Paddington Station.

CHELSEA.—June 19.—For the Supply and Fixing of Holland Blinds and Fittings at Infirmary. Messrs. Lansdell & Harrison, 12 Compton Terrace, Highbury, N.

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CHESTER-LE-STREET.—June 19.—For Building Shops, &c. Mr. Gibson Kyle, Architect, 145 Pilgrim Street, Newcastle-on-Tyne.

CLENCHWARDEN.—June 23.—For the Erection of Board Schools and Master's Residence. Mr. Herbert Green, Architect, Norwich.

CROYDON.—July 2.—For the Erection of a New Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

EPPING.—June 21.—For Construction of Works of Sewerage and Sewage Disposal, 9-inch Pipe Sewer, 9-inch Cast-iron Sewer, Manholes, Settling Tanks, Sludge Pits, with Concrete and Clay Irrigating Channels at Outfall, &c. Mr. E. E. H. Loughton, Sanitary Authority's Offices, Epping.

EXETER.—June 23.—For Repairs at Lower Market. The City Surveyor, 18 Bedford Circus, Exeter.

FULHAM.—June 20.—For Making-up and Paving Wheat-sheaf Terrace. Mr. J. P. Norrington, A.M.I.C.E., Town Hall, Walham Green.

GLOUCESTER.—July 2.—For Altering Existing Offices Erection of Council Chamber and other Works at Shire Hall. Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

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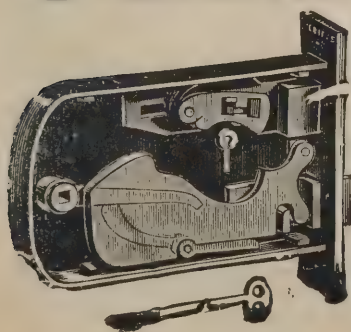
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HARROGATE.—June 28.—For Building Detached Residence, The Duchy Estate. Mr. T. Butler Wilson, F.R.I.B.A., Architect, Leeds and Harrogate.

KING'S LYNN.—June 23.—For Building Board School, &c. Mr. Herbert Green, Architect, Norwich.

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NEWPORT.—July 2.—For Construction of Storage and Intake Reservoirs, Tunnels, &c. Mr. Conyers Kirby, Engineer, Stow Chambers, Newport, Mon.

NEW TREDEGAR.—June 18.—For Additions to Workmen's Hall. Messrs. Aaron Davies & Son, Architects, Pontlottyn.

PORTSMOUTH.—June 19.—For Alterations to Board Schools. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

ROMFORD.—June 18.—For Building Cottage. Mr. F. Whitmore, Architect, Chelmsford.

SHOREDITCH.—June 20.—For the Erection of Two Cottages for Ailing Children. Mr. F. J. Smith, F.R.I.B.A., 17B Great George Street, Westminster.

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TORQUAY.—June 26.—For the Erection of a Promenade Pier. Mr. H. A. Garrett, A.M.I.C.E., Town Hall, Torquay.

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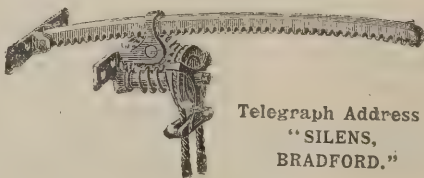
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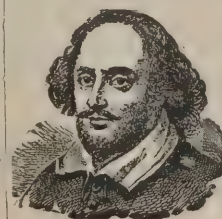
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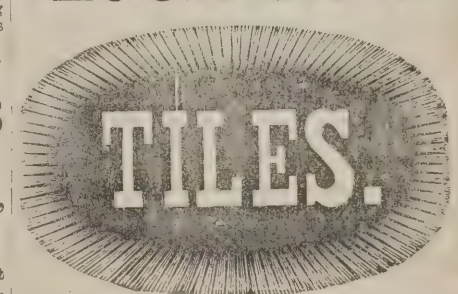
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Back Oxford Street.

J. Miles	117	4	5
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LONGLEY & Co., Crawley (accepted)	£2,410	0	0
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G. T. Manners, Durham	£349	0	0
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J. Manley, Bishop Auckland	293	10	0
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W. FOSTER, Croxdale (accepted)	210	0	0
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EXETER.

For Alterations at Foresters' Arms, Red Cross, Exeter, for Mr. W. Smith. Mr. JOHN ARCHIBALD LUCAS, Architect, Guildhall Chambers, Exeter.

VICARY (accepted)	£94	0	0
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For Building Cottage at Albert Place, Exeter, for Mr. F. G. Jones. Mr. JOHN ARCHIBALD LUCAS, Architect, Guildhall Chambers, Exeter.

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For Alterations to Myrtle Cottage, Exminster, for Mr. F. Kneel. Mr. JOHN ARCHIBALD LUCAS, Architect, Guildhall Chambers, Exeter.

UNDERHILL (accepted)	£110	0	0
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For New Roof and Other Work at Milbury Farm, Exminster, Devon, for Mr. A. W. B. Daniell. Mr. JOHN ARCHIBALD LUCAS, Architect.

MANLEY (accepted)	£199	0	0
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For New Roof to Portion of Kenbury House, Exminster, Devon, for Mr. A. W. B. Daniell. Mr. JOHN ARCHIBALD LUCAS, Architect.

MAYNE, Kennford (accepted)	£123	0	0
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J. Baldwin, Preston	605	14	0
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T. N. Livesey, Preston	560	1	0
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J. Harland, Preston	535	1	4
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G. Hill, Preston	523	8	6
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Swarbrick & Joy, Preston	503	13	7
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G. Lucas, Preston	487	15	9
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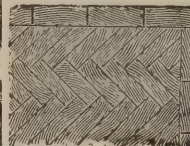
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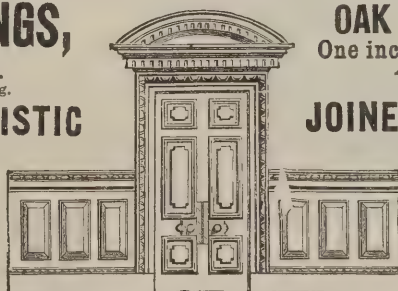
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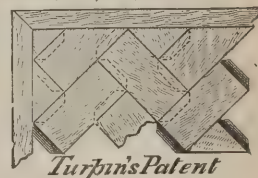
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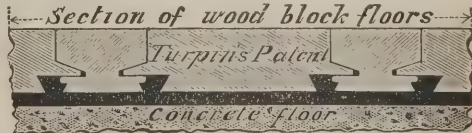
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R. & G. Brown, Amble, mason	£986	2	0
W. Bryson, Warkworth, carpenter and joiner	655	10	0
J. H. Lyall, plasterer	137	2	3
J. T. Corking, Jackson Street, Gateshead, plumber	135	0	0
J. H. Lyall, Church Street, Amble, slater	83	18	4
R. J. Richardson, 9 Saville Row, Newcastle, painter	71	8	7

TRADE NOTES.

THE new schools, Potter Heigham, are being warmed and ventilated by means of Shorlands' patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

At the monthly meeting of the Glasgow School Board, Mr. Boyd gave notice that at the next meeting he would move that all specifications inviting tenders for work should contain a clause binding the successful firm to pay the workmen not less than the standard rate of wages in the district, and that no firm should be allowed to sub-contract.

IN connection with the Merionethshire slate mines a departmental committee appointed by the Home Office have visited Belgium and the North of France to inspect the slate quarries of those countries, with the view to reporting upon the mode of working, the appliances used, the way in which the

slates are dressed, the hours worked and the rules in force for the prevention of accidents.

THE directors of the Aberdeen Tramways Company have accepted the contract of Messrs. John M'Adam & Co. for the execution of the works in connection with the proposed extensions, which will consist of the doubling of the line in George Street from Loch Street to Kittybrewster, the extension of the line from Bloomfield to Bridge of Dee, and the repairing of the Kittybrewster track. The cost of the scheme is estimated at about 20,000*l*.

BUILDING AND BUILDERS.

THE new buildings attached to the medical school of St-Thomas's Hospital, containing a students' club and laboratories, were opened by the Duke of Connaught on Saturday last. They cost about 16,000*l*. His Royal Highness said, "I must congratulate the architect, Mr. Currey, on the very handsome proportions of this fine building. It must have been a work of difficulty with this huge hospital so near to make a building which should be in harmonious keeping with the rest."

At the meeting of the Barnsley Town Council, plans for erecting the Kendray Fever Hospital by building fever wards at a cost of 1,600*l*. were approved, and tenders for the work ordered to be obtained. Mr. John Hood's tender for making up Brinckmann Street, 866*l*. 3*s*. 6*d*., was accepted.

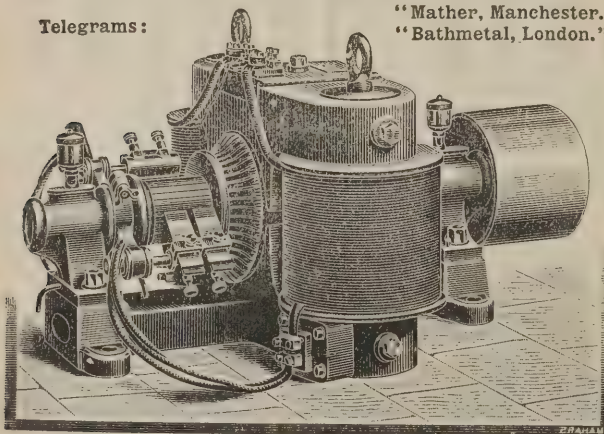
At a meeting of the Pershore Sanitary Authority a letter was read from the Upton-on-Severn Authority suggesting that a committee of the Pershore Authority should confer with their committee as to the advisability of erecting a joint hospital. A committee for the purpose was appointed. It was stated that the tramp who had the smallpox last year, and was isolated in a hospital tent, cost the Authority altogether more than 200*l*.

At Matlock the Duke of Devonshire has just opened a new suite of baths, and the Duchess attended a floral fête in aid of the Derbyshire Convalescent Home. His Grace made two speeches, referring to the value of hydropathy and the benefit of hospital treatment.

At the meeting of the executive committee appointed in connection with the Aberdeen University buildings extension scheme, a statement submitted showed that the total cost of the extension was now estimated at 140,000*l*; the money received including 40,000*l*. from the Government, amounts to about

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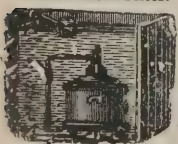
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90,000%, and there is thus a sum of 50,000% required for the completion of the scheme. It was resolved to issue an appeal for additional funds.

A GRAND hotel is to be built at Clacton-on-Sea, and a company formed for the purpose of carrying out the scheme.

PROBATE of the will of the late Mr. William Gibson, builder, Warrington, leaving personal estate of the value of 41,515*l.* 8*s.* 5*d.* has been granted.

THE fourth annual report of Dr. Ralph Copeland, the Astronomer-Royal for Scotland, gives a detailed account of the progress made with the new Royal Observatory on Blackford Hill. Up to March 31, 1894, the sum expended on the buildings at Blackford Hill was 20,364*l.* 6*s.* 9*d.*, exclusive of the outlay on the wire fence, drains and water-supply.

AT the holding of the Glasgow Dean of Guild Court, warrants were granted to the magistrates and council of Glasgow to erect seven tenements of shops and dwelling-houses in Saltmarket and Parnie and Chisholm Streets; the trustees of St. Silas's Episcopal Church, to erect mission-hall and porch in Park Road and Eldon Street; Archbishop Eyre, to erect an additional storey to the Roman Catholic School in Main Street, Maryhill.

ELECTRICAL.

WE are informed that the tender of Messrs. J. G. Statter & Co., 68 Victoria Street, S.W., has been accepted for the electric crane and generating plant at the works of Messrs. C. H. Glover & Co., Hatcham Saw Mills, S.E., to whom Mr. E. R. Dolby, of Westminster, is acting as consulting electrician.

THE Edinburgh Town Council, it is reported, have received estimates for the new electrical station at the West End, and that the lowest amounts to 18,000*l.*, which is 8,000*l.* above the prospective estimate laid before the committee by the burgh engineer.

AT the meeting of the sanitary committee of the Leeds Corporation the question of erecting boilers of 550 horse-power at the Meanwood Road destructor was considered. The matter was brought before the committee by the city engineer (Mr. Hewson), and it was pointed out that boilers of the power suggested might be utilised for the purposes of electric lighting for the municipal buildings, or for electric traction or cable traction on the tramways. A sub-committee was appointed to consider the question.

THE question of the erection of a refuse-destructor for Moss Side has occupied public attention for some time. At the latest meeting of the inhabitants Dr. Wahlutuch, as a medical man, expressed his opinion that burning was the most effective means of destroying refuse, but he was afraid that sufficient heat would not be generated in the destructor to prevent a nuisance. In the ordinary case it would be felt over the radius of a mile. It was perhaps worth considering whether a perfect destructor at a larger cost should not be erected in a proper place, capable of generating a degree of heat sufficient not only thoroughly to destroy the refuse but provide energy to drive a dynamo which would supply the district with electric light. It was resolved that a deputation should be appointed to wait upon the Local Board to represent the feeling of the district.

THE chairman of the electricity committee of St. Pancras Vestry (Mr. A. Sweet) has just made his annual report to the vestry. He described the past year's business as satisfactory. The total income was 15,022*l.*, sufficient to clear off the deficit of the first year—1,543*l.*—and, after paying all the working expenses, and 927*l.* in maintaining the works in the highest state of efficiency, to leave a balance of 4,669*l.*, out of which interest and repayment of loans had been met. The extension now nearing completion at Stanhope Street Station, and the station in course of erection at King's Road would, it was hoped, be in working order and available by next winter. The ratio of cost for public lighting for the year by electricity, as compared with gas, was high, but the charge of 6*d.* per unit made for public lighting was certainly less than a company would charge under similar conditions, and from Michaelmas next the charge would be reduced to 5*d.* per unit. The supply of electricity to private houses, though not large, was promising, as the number of consumers had doubled during the year.

LAST week a large company assembled at the Croydon Clock Factory for the purpose of witnessing the casting of the large hour-bell for the tower of the new municipal buildings, which are being erected at a cost of 100,000*l.* The bell will weigh 36 cwt. It was mentioned as an interesting fact that the metal used on this occasion, or the greater part of it, had for eleven years done duty as a bell on the Eddystone Lighthouse. A siren is now employed on the lighthouse, and the two bells, each weighing 2 tons, have returned to Croydon, where they were cast, the Trinity House authorities having sold them to Messrs. Gillett & Johnston.

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STAIRCASE.—FREE PUBLIC LIBRARY, EDINBURGH.

STAIRCASE.—IMPERIAL INSTITUTE.

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VARIETIES.

THE *Leeds Mercury* of the 13th inst. in a short paragraph gives a description of the improvements which are nearly completed at the Roundhay Park. A more pleasant recreation-ground, we may add, and we have seen many, could not be desired.

AT Mexborough an inquiry has been held at the Market Hall in reference to an application of the Local Board for power to borrow 14,000*l.* for purposes of water supply (including the purchase of the undertaking of the Mexborough and District Water Company, Limited), and 2,250*l.* for works of street improvements and sewerage.

ON Monday a large building, four storeys in height, situated at 61 Bishop Street, Glasgow, and occupied by Mr. Richard Fraser as a cotton store, suddenly collapsed, four workmen fortunately escaping just before the structure fell. The building was of brick and was a very old one. On the third floor about twenty tons of cotton were stored, and the four workmen observing that the building was giving way, rushed from the place just before the three lower flats and about 25 feet of one of the side walls crashed to the ground.

THE Crown Hotel, Scarborough, the principal hotel in the town, has, the *Leeds Mercury* understands, been purchased by private contract by the Scarborough Company. The purchase money is stated to be 25,000*l.*

AT Manchester St. Mary's Churchyard and the site of the old church have been converted by the parks committee into a pleasure ground for the public, and the gates were opened yesterday for the first time. The ground is about half an acre in extent, and is one of the pleasantest of the now numerous open spaces in the city.

THE finance committee of the Widnes Town Council report that the Local Government Board has sanctioned the borrowing of 10,265*l.* for the provision of the proposed technical schools and free library. The committee recommend that application be made to the Local Government Board for sanction to borrow 9,130*l.* for various works of private street improvements, the night-soil depôt, and the provision of disinfectant and mortuary buildings at the infectious diseases hospital.

THE Wilmslow Local Board have been granted a provisional order enabling them to acquire nine acres of land on the border of their district for a sewage farm, to stop the pollution of the river Bollin.

THE Trawden Local Board propose to borrow 5,000*l.* for sewage purposes, and to construct works connected therewith.

THE Glasgow Bridge Bill has been passed by Lord Belmore's committee, under conditions which were assented to on behalf of the promoters.

THE British fire brigade officers, under Captain Dyson, have returned to London, having travelled over 4,000 miles and inspected some 160 Continental fire brigades, including those of the cities of Amsterdam, Berlin, Vienna, Budapest, Venice, Florence and Milan. They have got together a mass of information, rules and annual reports of various brigades, illustrations and drawings of fire apparatus, and several small appliances novel to this country.

AT the meeting of the Hartlepool Town Council Mr. Hunter called attention to the dangerous and disgraceful condition of the town owing to a total cessation of the public lighting, but the lighting committee said they merely acted upon last year's instructions from the Council to suspend the lighting for three weeks on each side of the longest day.

AT the meeting of the Royal Meteorological Society on Wednesday, the 20th inst., papers will be read on "Fogs Reported with Strong Winds during the Fifteen Years 1876-90 in the British Isles," by Mr. Robert H. Scott, M.A., F.R.S.; and on "Some Characteristic Features of Gales and Strong Winds," by Mr. Richard H. Curtis, F.R.Met.Soc.

AN inquiry has been held by the Local Government Board at Conway into an application made by the Town Council for powers to borrow 1,000*l.* to erect workmen's dwellings.

AT the Methodist New Connexion Conference in Loughton on Wednesday it was reported that forty-five new chapels and schools had been erected during the year, the estimated value of which was 29,418*l.*

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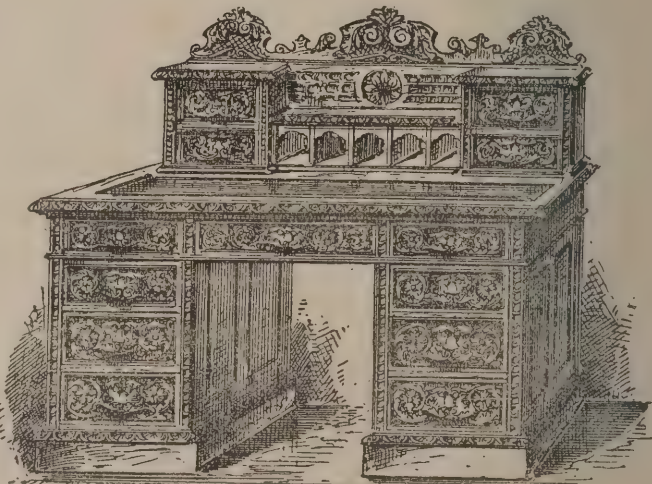
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THE Lord Provost's committee of the Edinburgh Town Council have instructed Messrs. Cunningham, Blyth & Westland, C.E., in conjunction with Mr. Morham, city architect, to prepare plans of a new North Bridge. It is not expected that these will be ready for three months.

TRADES CONFERENCE.

THE first of a series of trade conferences to discuss the subject of technical education in its relation to the various London industries has been held at the County Hall, Spring Gardens. Mr. Sidney Webb presided. The Technical Education Board of the County Council convened the conference in order to hear suggestions from those engaged in the trades as to the best method of allocating the all too small means at the disposal of the Board for assisting technical education in these industries. Mr. Dilly, of the bricklaying trade, who was first called upon, pointed out that the practical workshop of to-day is not at all what it should be, and that the bricklayer is being left behind because he is ignorant of sanitary science, especially in regard to drainage and ventilation. It was suggested that bricklayers should have to pass a practical examination, just as carpenters, plumbers and metal-workers do, and that they should be registered. The majority of delegates who subsequently spoke advocated a return to the old apprenticeship system, and declared that the work of the classes must supplement the work of the workshop.

Mr. F. T. W. Goldsmith, hon. secretary of the Architectural Association, on being asked by the chairman, Mr. Sidney Webb, L.C.C., to speak, referred to the necessity of affiliating workshops to the Architectural Association, with the view of bringing the architect and the craftsman into closer relationship than at present.

Mr. Goldsmith stated that, as representing the Architectural Association, he ventured to commend the scheme to the earnest attention of the Technical Education Board and to ask the Board to assist the Association in this branch of its work with grants of scholarships, pointing out that benefit could not fail to result from the architect learning in the workshops, with the workmen, the limitations of the materials which he designed, and the advantage that must necessarily accrue to the workmen from being so associated with the architect, which would result in a better understanding between the architect and the craftsman. Mr. Goldsmith carefully pointed out that the carrying out of the scheme would not result in any infringement of trade

rights, but that all the instruction would be given by properly qualified workmen, who would be generously paid for such instruction. It was proposed to make the instruction less in the form of a class than by direct personal supervision by artisans skilled in the different trades. He trusted that in the course of time the scheme might be widened and extended with the help and support of the County Council, and referred to some correspondence in the current number of "A. A. Notes," which indicated the lines upon which this proposal might be carried out.

WOOD PAVING IN MELBOURNE.

ACCORDING to Mr. A. C. Mountain, the city surveyor of Melbourne, Australian timber was first used as a material for street-paving in Sydney, N.S.W., where an experimental section (comprising several kinds of New South Wales hard and soft woods) was laid in August, 1880, under the direction of Mr. Mountain, who was then city surveyor to that city. The result of this test established the fact that several of the Australian hardwoods were well suited for street pavement. This example was soon followed by the city of Melbourne, the result being that at the present time these two great centres and their suburbs contain considerably over half a million square yards of paving composed of Australian hardwoods.

At first the practice was to lay the blocks in rows with wide joints (from $\frac{3}{4}$ inch to 1 inch in width), but experience has shown that—with proper care during damp weather—the hardwood blocks on ordinary gradients gave good foothold to horses, and the width of the joints has been gradually reduced to $\frac{1}{4}$ inch, and in Sydney the joint has been actually abandoned and the blocks laid close together.

In New South Wales the woods principally employed on this work are:—Tallow wood (*Eucalyptus microcorys*), black butt (*E. pilularis*), spotted gum (*E. maculata*). The various ironbarks, admirable as they are in strength and durability, are not used, being too valuable for wood-paving.

In Victoria, the only locally-grown hardwood used on the streets, to any extent, is the Murray river red gum (*Eucalyptus rostrata*); but the West Australian kauri (*E. diversicolor*) has been introduced, and also the New Zealand kauri pine, both of which timbers have answered well in the work. The latter, although not a hard wood, would appear to have a much longer life in the street than the Baltic or Memel pines used in England and the Continent for wood-paving.

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The factors governing the wear of a road are so difficult to calculate, and the method of construction so liable to afford variable results, that it is hard to say with certainty how long Australian timber will last in a street. It is fair to assume that in a street of heavy constant traffic (such as Flinders Street, Melbourne, or George Street, Sydney) a thoroughly well made wood pavement would last from twelve to fourteen years. This will mean sound well-grown timber, free from sap or decay of any kind, laid on good foundation and with thin joints. A bed of Portland cement (varying in thickness from 6 inches to 12 inches, according to the nature of the foundation, finished off with cement rendering consisting of 3 of sand and 1 of cement) not more than 1 inch thick, to insure a fair and even surface, is first laid. On this the blocks varying in breadth from 7 inches to 9 inches, 3 inches in thickness and 6 inches depth (measured along grain of wood), after being dipped in hot tar and well drained, are laid down with close joints diagonally across the street. The joints are then sealed by being "run in" up to the surface with hot tar, boiled for two hours and no longer. A few mastic joints should be left occasionally on account of swelling.

BUILDING AT LONGTON.

At the last meeting of the Longton Town Council a report was received from the plans committee which referred to the intended new streets proposed to be laid out in the Florence district by the Duke of Sutherland. The borough surveyor had applied for plans and sections of the 12-foot back roads at the rear of the properties to be built, in accordance with section 39 of the Longton Improvement Act. Mr. J. H. Garrett, the duke's surveyor, had written stating that this question of back roads was fully discussed some years ago, with the result that section 39 was not put in operation with respect to certain property at Normacot. Being under the impression that the section would remain inoperative he had continued to negotiate the disposal of his grace's land for building purposes without making any provision for the introduction of the back slums now asked for. Plans of new streets and of many new houses in the neighbourhood had been passed by the Council without mention of these back roads, and now that the district was partially laid out and no notice having been taken of section 39 for so many years, it seemed harsh to spring it upon them again without any apparent reason. The committee recom-

mended that in all cases wherever land is laid out for building, and the backs of dwellings in an intended new street shall be opposite to the backs of dwellings in a street parallel therewith, there shall be provided a back road, not less than 12 feet wide between the yards of such dwellings, such road to be uncovered for its entire length, and at or near the end thereof communicate with a street. Mr. E. Brookfield said that the whole difficulty had arisen through the Duke of Sutherland disposing of his land for building purposes without giving the purchasers an opportunity of complying with the requirements of the Corporation. The simple question was whether their Act of Parliament regulating such matters was to remain a dead letter, or whether the plans committee were to enforce it. Several members contended that the Act ought to be enforced as strictly in the case of the Duke of Sutherland as in that of an ordinary individual, and ultimately the recommendation of the plans committee was confirmed.

THE TEAK TRADE WITH SIAM.

A PAPER was read in the Modern Section of the Society of Arts recently by Mr. C. D. Leckie on the commerce of Siam. In the course of it he said:—In the northern towns of Cheangmai and Lakon one meets with British houses established in business, directing the working of the teak forests; one meets with British Burmans and Shans in numbers working the forest contracts; and when the teak has been passed down to Bangkok, you find three steam mills belonging to British firms, and one only worked by a Chinese-Siamese firm. There are four smaller establishments with some machinery—one, an Anglo-French firm; another, Austrian-French; a Dutch and an Italian; but those four firms together do but a very small export business. In these mills you again find only British machinery. As the export of teak from Siam is almost entirely confined to Europe (the cargoes being sold through London), or Bombay, or Hong Kong, one may speak of the teak trade of Siam as a British trade, carried on by British capital and British management. London merchants have put down large sums of money in the north of Siam in this teak industry, for the business entails the employment of a large capital. There are no German or French firms connected with the northern teak forest works.

Ten years ago the British trade in teak was confined to the Bangkok district, and the only means open to the Bangkok merchants of securing teak was by buying rafts of rough

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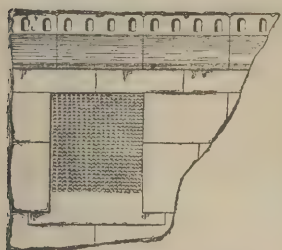
timber from the natives as they reached Bangkok, or by buying hand-sawn squared teak from the Chinese hand-sawyers in Bangkok. Nowadays the British firms work the wood themselves out of the forests, and pass it down the rivers to their Bangkok mills.

A teak forest is generally supposed to be something entirely different from what it actually is. One can go up the bed of a stream flowing into one of the northern rivers, and you may walk miles without seeing a single teak tree; you meet with paddy-fields, dense jungle, open jungle, mountain gorges, splendid scenery, but the thing you meet with seldom enough when looking keenly for it is a teak tree. The teak grows here and there on the sides of the hills which spread for miles from the stream, and although in places it grows in rich patches, it was never my fortune to get into a really rich patch. The method of the work is tedious. A forester sends his elephants, in care of their mahouts, into the forest, for which his employers have a lease from the Government or the working rights from the holder of the lease, and drags during the rainy season as many logs as his elephants can manage to the bank of the stream. It is quite a usual thing for the teak to be dragged four or five miles to the stream, and it is a good forest which can show a record of fifty logs being worked by one elephant in one season. The elephants then stack the wood on the bank of the creek, where it awaits the inspection of the buyer. After measuring the logs are put into the stream, and then comes the great delay, often enough, of waiting for sufficient rain to float the wood down the streams into the rivers. With a moderate rise of water, the elephants follow the wood along down the river bed, and push it off sand-banks and rocks where it sticks, and get it into the river at last. When once in the river the wood is left to itself, if the water is too deep to allow the elephants to walk down the river bed, and the logs spin away down stream unassisted. After passing through the rapids, which descend to the low lands extending from the sea to the foot of the northern plateaus, the wood is caught by rafters, and tied up into rafts of 150 on the Me Ping, or 100 logs in the Eastern river, and sent on down the 400 miles or so to Bangkok in care of the Siamese rafters. The rafting waters are from June to November. The work is slow, for the average time used in delivering a teak tree into Bangkok from its stump where it was felled is about three years, although the distance actually covered is not over 600 miles.

The Burmese and Shan foresters who work for the British firms are all British subjects, and as the trade is carried on for the most part through them, the teak trade in the forests is really a British trade. The owners of the forest leases with but few exceptions are the Laos chiefs and princes, who receive a royalty on every log worked out of a forest, and the Government collect a second duty before the wood enters Bangkok. The labour is mostly supplied by the native hill tribes, Kamouks and Kariengs. Kamouks come to the teak workings from across the Mekong, and as they are now being cared for by the paternal Government of France, it is possible our labour question in the teak forests may become difficult.

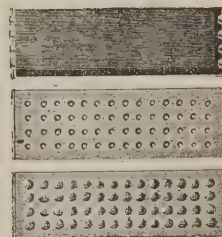
The preservation of teak forests, which has had such excellent attention from the British Government in India, has been ignored in Siam; but we now begin to hear of certain stipulations being put into new leases, imposing on the lessee the obligation to plant four teak saplings for every one tree felled during the term of a lease. The British firms buy only wood which has reached a certain maturity, and their contractors deliver no very young wood. But the natives send down to Bangkok annually large quantities of quite young teak; this has gone on unchecked by the Government, and several thousands of these logs come on the Bangkok market every season, and are bought for posts and light beams and house work. The simple remedy of forbidding the delivery past the Government timber duty station of all teak below a certain girth would cure the evil quickly, and prevent any necessity of irksome stipulations being imposed on British traders.

The annual export of teak from Siam to Europe, Bombay and Hong Kong is likely to increase, as the northern forest work gets better organised, and the elephant force employed increases. The annual supply of rough logs into Bangkok is so entirely dependent on the rainfall for the year that there must always be the great variation in quantity shown by the export lists of the past six or eight years. I will mention here that the coinage used in the north of Siam is the Indian rupee. As soon as the Cheangmai plateau or the Lakon, Phrae, Nan or Ootaradit districts, and the rich Mekong plain are reached, the Siamese tical ceases to pass current, and in this large section of Siam the British rupee is the only coin the people understand. The British teak firms have to import their rupees and send them up to Cheangmai. It is interesting to find a large portion of Siam using British coin, and maintaining it for many years after the establishment of the tical mint in Bangkok.



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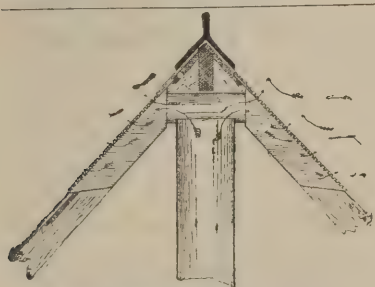
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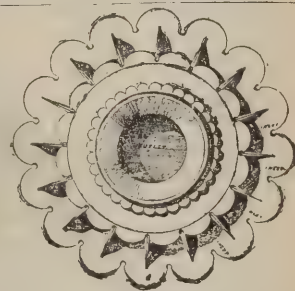


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TRADE MARKS IN GREECE.

IN his last report Captain James Boyle writes from the British Consulate at the Piræus:—The bill for the protection of industrial and trade marks in Greece has now come into operation. Her Britannic Majesty's Minister at Athens enclosed a translation of the bill to the Foreign Office, dated January 16, 1893, but since this a royal decree has sanctioned the bill, and it has become law. There is no doubt but that this bill was very much needed, as there were frequent frauds of trade marks and infringement of existing regulations; but now this bill is passed and has become law, parties registering their trade marks will have full protection as long as they abide by the rules laid down. It is necessary for anyone wishing to register their trade mark in Greece, in the first instance, to proceed as follows:—1. They must send out to Greece three copies of their trade marks with plate to their representative. 2. A copy of registered trade mark in England, which must be legalised by the Greek Consul wherever there is one. 3. A special power of attorney, and to save trouble and expense, this power to be made out in the Greek language and preferably at a Greek Consulate. All the above documents will be placed in the Court of the First Instance at Athens. Sixty francs in gold, not paper, and two francs in gold is to be deposited in the Treasury at Athens on application for registration. Ten to twelve francs in gold will cover all other expenses so I am told, such as stamps on legal paper, &c., fees to clerks, but whether this can be said to be correct I am unable to say, as every official clerk in the Greek courts appears to claim something. It will be necessary for anyone wishing to register his or their trade mark to appoint someone as their legal representative in Piræus or Athens, to carry out the various regulations, and on application to me I shall be most happy to give the name of some trustworthy person who can perform all the necessary duties.

NEW COMPANY.

THE business of Messrs. Baird, Thompson & Co., ventilating, sanitary and heating engineers and specialists, London and Glasgow, is being converted into a limited liability company with a capital of 60,000*l.*, and the prospectus is now being issued privately amongst their friends and clients. The prospectus is accompanied by a list of some of the more important works carried out by the firm at home and abroad, filling 16 quarto columns of printed matter, and includes the palaces

of the Emperors of Germany and Austria, the Admiralty, War Office and other Government offices, many theatres, town halls, colleges, institutes, schools, churches, ships, &c., in all parts of the United Kingdom and various parts of Europe. This list, however, it is stated, conveys only a partial idea of the extensive business that has been carried on by the firm, as it professedly only deals with ventilation, heating and sanitation of buildings, &c., and gives little or no account of the important work which has been and is being done by them in ship, tunnel and mine ventilation, also drying and cooling, in water softening and filtration on a large scale for public supply, and in other departments of scientific sanitary engineering. The board of management is constituted as follows:—

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JAMES MATHER, Esq., 15 King William Street, London, E.C.
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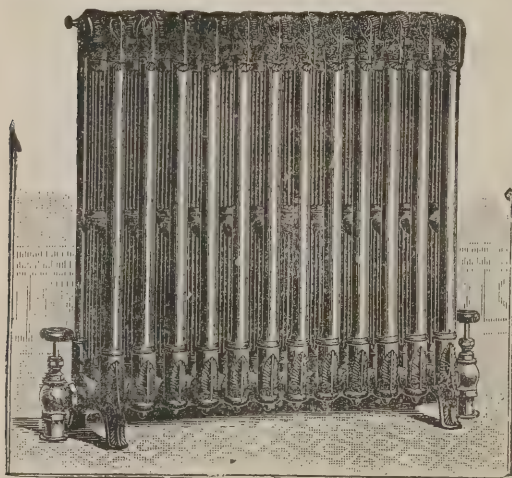
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THE ARBITRATION CLAUSE IN SCOTLAND.

THE law in Scotland does not correspond in all respects with English law, but there seems to be no difference between the practice of the two countries when dealing with the arbitration clause in contracts. The correspondence has been manifested in an action in which Mr. John Mackay, contractor, Inverness, sued the Thurso River Harbour Trustees for 7,519*l.* 7*s.* 2*d.* In 1890, Mr. Mackay undertook the construction of works at 14,577*l.* 16*s.* 9*d.* It was provided that as security he should deposit 1,000*l.* in the names of himself and the clerk to the trustees. Operations began in November 1890. Mr. Mackay withdrew in March 1893, in consequence, as he alleged, of the failure to pay the instalments. The trustees then took possession of the works and proceeded with the construction of the harbour. As this act was said to be illegal, plaintiff thought that they should be ordered to deliver the machinery, &c., up to him, or pay the value, 1,359*l.* 13*s.* The Trustees pleaded that under the reference clause in the contract the questions at issue ought to be remitted to Mr. James Barron, C.E., Wick, the arbiter named. The plaintiff maintained that Mr. Barron having identified himself with the interests of the harbour trustees, and having throughout exercised his functions as engineer and arbitrator according to their advice and instructions instead of according to his own judgment, was disqualified from acting as arbiter.

Lord Wellwood, who heard the case, said that in order to void such an agreement to submit as that contained in the contract, it must be shown either that the question did not fall within the reference clause or that the arbitrator was disqualified, and in his opinion the allegations on both of these points were insufficient and inconclusive. The contractor's position was that he was compelled to dissolve the contract in consequence of his not being kept in funds to carry it out. The matter to be inquired into was whether the contractor was or was not paid a fair value for the work as it proceeded, and whether he was or was not entitled to dissolve the contract by throwing it up and compelling the trustees to finish the work at their own hand. These questions fell precisely within the matters which the parties agreed to submit to an arbitrator. Another question was whether any relevant statement had been made to the effect that Mr. Barron was disqualified from acting as arbitrator. In such a matter the contractor was bound to make most specific statements of corruption. He had not done so, and they were left entirely in the dark, as to the precise ground of

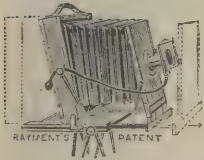
disqualification. The complaints were wrapped up in a cloud of words which might mean anything, but were not relevant to infer that the arbitrator was disqualified. As regards the claim of damages, if the defendants were in fault in withholding payment for the work done, then the plaintiff had no claim of damages at all. Even supposing that the arbitrator should hold that the plaintiff was in the right, his lordship still thought there was no relevant claim of damages, because, in his view, the contractor should have got the decision of the arbitrator during the contract, and if he had done so this claim of damages never would have emerged. His lordship accordingly found that the questions raised other than the claim of damages should be submitted to the arbitrator. As regards the claim for damages, he found that the plaintiff's statements in support of it were irrelevant, and dismissed the action in respect of that claim. The question of expenses was reserved.

NEW INFIRMARY, KING'S NORTON.

THE King's Norton Board of Guardians recently invited architects to submit designs for a new infirmary, on a site adjoining the present workhouse at Selly Oak. Nineteen sets of plans were sent in. Those by Mr. Daniel Arkell, of Birmingham, obtained first place, under the motto "Practical." Second position was awarded to "Comforts for the Poor," by Messrs. Essex, Nicol & Goodman; "Hygiene," by Mr. Lavander, being placed third. Mr. Arkell's designs will be carried out, and comprise an administrative block in the centre, containing matron's and medical officers' rooms and stores, and a scheme is shown for suggested future extensions for operating-rooms, with lavatory, surgeon's private and consulting rooms, medical stores, dispensary, dispenser's private room and store. At the rear of the administrative block are the cooking kitchens, nurses and servants' rooms, cooks' room, culinary stores, sculleries, washhouses and laundries. Provision is made at the extreme rear of the buildings for a future nurses' home. From each side of the central administrative block run straight corridors, to which the sick-wards of the new infirmary are connected, these having nurses' duty rooms, separate rooms for two and four beds, and linen closets in close proximity, with bath-rooms, water-closets and lavatories at the end. These are connected to the wards by short lobbies to give cross ventilation. Emergency staircases are provided to each ward, and hydrants are placed in all wards and along the corridors, so that sufficient means

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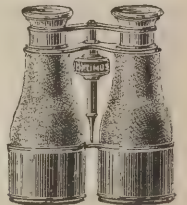
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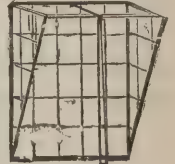
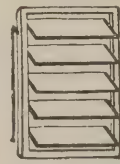
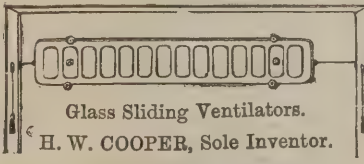
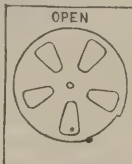
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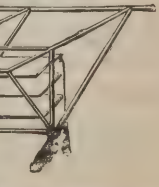
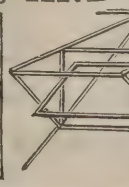
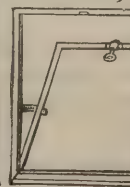
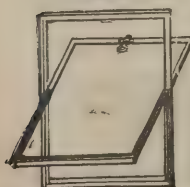
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will be at hand to deal with any outbreak of fire. The wards are spaced out along the corridors in such a manner that the air has free circulation round them, and they are also so situated that the full benefit of the morning and evening sun is obtained. Accommodation is provided for 250 patients, viz. 120 males and 120 females, with lying-in and labour wards for 10 persons. The wards are heated by means of open stoves. The administrative block, kitchens, &c., are made large enough to deal with an additional 250 patients, which with the 250 provided for in the present scheme would make a total of 500 inmates. The whole of the buildings are so placed that they may be extended at any future time. The new infirmary will be carried out as nearly fireproof as possible, and the sanitary and ventilating arrangements will have great care and attention, so as to make the new building in every way perfect. The front elevation to the road will be of a plain character, but will have an imposing appearance; the open verandahs which are shown at the ends of pavilions will have a very picturesque effect. The whole of the drawings have been well planned and show careful study. The infirmary when completed, including furnishing, will, it is estimated, cost nearly 20,000*l.*, and the works are to be commenced forthwith.

THE KIRKDALE PRISON SITE.

A DEPUTATION from the Liverpool Corporation waited upon the Home Secretary on Tuesday asking that the Kirkdale Gaol, which is now disused, should be sold to the Corporation for the purpose of utilising the site as a recreation-ground. Mr. Miles, chairman of the finance committee, Mr. Garnett, chairman of the estates committee, and Mr. Skelmerdine, the city architect, represented that the prison was situated in the midst of a thickly-populated neighbourhood, and the nearest public park was a mile and a quarter distant. The Corporation had been much pressed to find work for the unemployed, and this would enable them to do so in pulling down the buildings and laying out the grounds. They felt that they ought not to be placed in competition with the speculative builders who desired to make a profit out of the site, and urged that the Government should follow the precedent set in regard to the Millbank Prison site. The Corporation had a surplus of the city fund, and were prepared to give 15,000*l.* for the site of 10½ acres. Mr. Asquith, in reply, expressed his sympathy with the objects of the deputa-

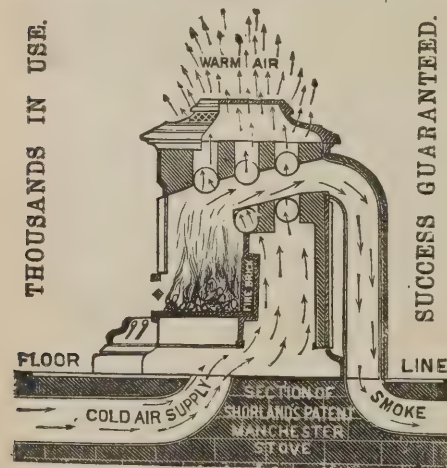
tion, and said that he should certainly give the Corporation the preference over the speculative builder, but the fact was that in this case the tenders so much exceeded the price which the Corporation had previously expressed their readiness to pay, which was less than the 15,000*l.* now offered, that in the opinion of the Treasury (from which he could not dissent), as representing the taxpayers, they would be hardly justified in making so large a sacrifice. The highest tender was 17,650*l.*, and if the Corporation's present offer were accepted that would represent a sacrifice of 2,650*l.* He would use what gentle pressure he could upon the Treasury to secure the site for the Corporation, so that it should not be built over; but, on the other hand, it was possible the Corporation would also have gentle pressure put upon them to make a further advance in their offer.

PRESERVING TIMBER.

WHEN Mr. Gardner, Jamaica Street, Glasgow, introduced his process nearly twenty years ago, we gave several notices, the *Glasgow Herald* says, as to the successful tests made in coal pits and dry-rot localities, where two or three years gave severe tests, and now we have the pleasure to know of a fifteen years' test, which deals with an extensive range of quays, where rot would show itself in about three years if the timber had not been preserved. It gives also the property of being partially non-inflammable and so different from creosote that the preserved timber is not only used for docks, railway sleepers, &c., but having no smell, covers the whole range where timber is required up to the finest of cabinet-work, and as the cost is less than that of creosoting, we have no doubt but a great future is in store for a process having so wide a scope. Extract from letter from engineer to Greenock Harbour Trust, showing results of fifteen years' exposure of Gardnerised timber:—"Greenock Harbour Trust Engineer's Office, Greenock, May 22, 1894.—In 1879 the pine timber used in the extension of the West Quay here was subjected to Gardner's No. 2 process. In 1881 the pine timber used at the new frontage to the Custom House Quay was also subjected to the same process. In both cases the timber has stood remarkably well. Within the last month, Mr. R. Crawford says, I made a special examination of the above quays and found the timber quite sound. If I had additional wharfage to provide, I would have all the timbers Gardnerised."

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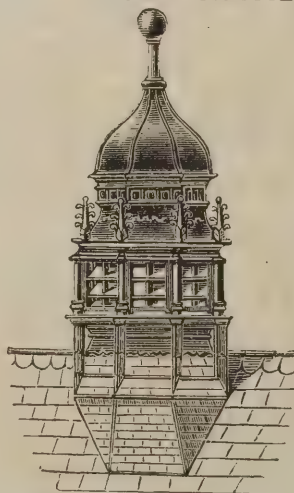
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POWER DISTRIBUTION BY ELECTRICITY, WATER AND GAS.

(Concluded from last week.)

Now let us briefly consider how power produced by gas-engines can meet the needs for electric light for a large town provided with a complete network of gas mains. In this case (which is practically the case of every large town in the civilised world) the electric light comes as competitor against the method of illumination which has practically only just established a firm reputation for reliability, economy, efficiency, &c. There is no doubt that the conveniences of gas for lighting and heating are apt to be overlooked because of our familiarity with them. Had we experienced the inconveniences of oil and candle lighting I feel sure the electric light would not have made so much progress as it has done. Further, the gas business is in the hands of a powerful body, powerful alike in experience and in resource.

Experience of practical working in London and other large towns shows that in certain districts and under certain conditions there is a sufficient demand for the electric light to make it worth while to work independently of the gas company altogether. But consider the very vast majority of country towns already supplied with gas, where it is obvious that an independent electric light company would eke out a very miserable existence, and that probably for only a short time; it would certainly seem reasonable that a combination of electric light and gas interests would solve the problem of electric supply to the inhabitants, and if this is so, then the principle ought to apply *à fortiori* to large towns. At present these interests conflict, and it is universally experienced that some one has to pay for this conflict.

Let us try and examine this a little more closely. If electric light and gas interests harmonise, the first advantage that suggests itself is the ready-made central station, namely, the gasworks. It is then necessary to establish distributing stations at suitable points in the town. Each distributing station would consist of gas-engines and dynamos and regulating apparatus. Each distributing station would supply its own network of mains for the needs of its own neighbourhood. These networks would have to be connected by a trunk main, so that any one

station could be relieved by any other in case of emergency and during the period of light load. The details of the plant of each station and the number of stations would be dictated by local conditions, so that it is impossible to do more than state the broad principles.

As there would be no boilers, no chimney-stack would be required. Probably in nine cases out of ten the basement of some house could be adapted to accommodate the necessary plant—hence a great saving would be effected in special buildings. Further, the labour required would be diminished. The cost of superintendence would probably remain the same, but might be increased.

Now as to the cost per unit delivered, there is fortunately not much difficulty in determining this, as many examples of the generation of electrical energy by gas power now exist. The author has selected the results of the weekly records of a plant at Bradford supplying 300 lamps. The total cost per kilowatt hour delivered is almost exactly 2d., with town gas at 3s. 3d. per 1,000. But to adapt this to a distributing station, 5 per cent. should be added for loss in mains, and 0.3d. per kilowatt hour for depreciation in plant and buildings. This would bring the cost to 2.4d. Adding the very liberal allowance of 0.6d. per kilowatt hour for management expenses, the total cost would amount to 3d. per kilowatt hour delivered. This is a lower figure than that usually realised in practice by any purely electric supply company working under the conditions above assumed, and no doubt this aspect of public electric supply has for some reason or other not received the attention it deserves.

In order that the two systems (direct use of gas and gaso-electric) be commercially equivalent, the cost of maintenance of the plant, the interest and depreciation and management expenses must be compensated for by the economy in gas consumed.

Now it is frequently thought that nothing can be more economical than the system of sending the gas direct to the burner. But this is far from being true. The miserably low efficiency of the gas-burners is rarely appreciated. According to Professor Tyndall, the efficiency of the gas-burner is 0.317 per cent. Taking the calorific value of London gas at 620 thermal units per cubic foot, only the equivalent of 10 thermal units reappear as light out of a possible 3,100 thermal units in a 5-foot burner. When gas is utilised to produce motive power, its efficiency and that of the incandescent lamp is so superior that a very different result is obtained. The efficiency of a



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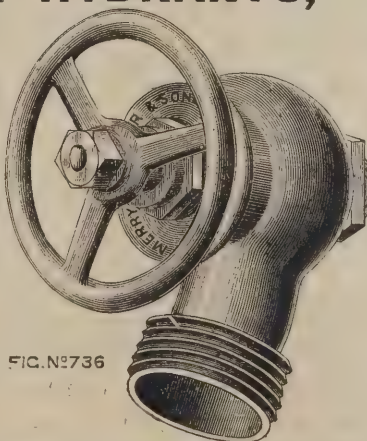
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GOLD MEDAL, Inventions Exhibition, 1885.

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16 per cent. incandescent lamp being about 6 per cent., and assuming a mechanical efficiency of 80 per cent. for the gas-engines and 85 per cent. for the dynamos, including loss in transmission, it is found that about 25 thermal units would reappear as light out of a possible 3,100. So that in spite of the threefold transformation of energy introduced, the final result is increased 2.5 times. This ratio would of course be still further increased in the case of arc lamps. The value of these ratios, taking minimum values in the cases of electric generation by gas-engine power, are as follows:—

Character of Burner.		Percentage increase of candle-power obtainable by using a gas-engine to drive a dynamo supplying electric lamps, as compared with that obtained by burning the gas direct.
Gas.	Electricity.	
A good ordinary 5 feet gas-burner, such as a Bengel burner.	An incandescent electric lamp, using 4 watts per candle, and giving 16 %	Per cent. 78
A Wenham lamp.	An arc electric lamp of same power as Wenham gas lamp.	227

The reason of this is that the chemical combustion of coal gas with oxygen yields a flame in which the undulatory vibrations of a sufficient frequency to become luminous are extremely few compared with the heat waves, whereas in a gas-engine it is these heat waves that are transformed into mechanical energy.

The chief points of a gaso-electric system of distribution may be summed up as follows:—

(1) The generating station already exists and may be considered as an eccentric power house. (2) The existing gas mains are available, hence there is no question of a separate main network being laid as in the case of hydro—or aro—

electric supply. (3) The useful efficiency of gas is out of all proportion greater when utilised as a motive power than when burnt direct in burners, and this in spite of the extra transformations of energy introduced. (4) It is more than probable that under a system such as has been discussed above, the cost of maintenance, superintendence and management expenses will be less than under conditions of independent electric supply. (5) By paving the way for the substitution of electric for gas lighting without conflict of existing interests, an incalculable benefit is conferred on the community.

Of course the hydro-electric system may be treated from the same point of view if once hydraulic supply mains exist. But the present efficiency and character of high-pressure water motors do not suggest the possibility of any very great economy being effected. It must not be forgotten that Van Rysselbergh's claim to economy is based upon a motor efficiency of 80 per cent., which, though not unattainable, is very high and could not be relied on as an average result in practice. But for large private installations the energy supplied by the hydraulic power company could with advantage be utilised.

Take, for example, an installation in which, say, 200 8 candle-power lamps each burn on the average 3 hours per day. The average electrical energy required would be 18 kilowatt hours. In order to profit by the rates of the hydraulic power company it would be necessary to employ accumulators and to charge during the night or early morning. For such an installation an accumulator costing complete 350*l.* would amply suffice; the motor and dynamo and instruments might cost, say, 150*l.* more, making 500*l.* in all.

The maintenance account would then stand as follows:—

Interest and depreciation at 10 per cent.	£50
Cost of hydraulic power per year of 300 days, taking 66 per cent. as combined efficiency of motor and dynamo. Water at 1 <i>s.</i> per 1,000 gallons and 10 per cent. loss in cells.	740
Attendance and maintenance, say	50
	£840

Cost of energy drawn from supply company's mains at 6 <i>d.</i> per unit, 18 kilowatt hours per day at 6 <i>d.</i> for a year of 300 days	£1,350
---	--------

This shows that even on so moderate sized an installation a very great saving can be effected by generating electricity on the premises and using hydraulic power.

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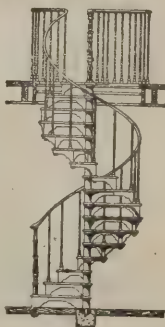
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THE SANITARY INSTITUTE.

THE following papers were set in the examination for local surveyors on June 1 and 2 :—

1. What is the distinction between "sewer" and "drain" under the Public Health Acts Amendment Act? and give a summary of the powers and duties of local authorities in the laying down of sewers, in the ventilation of sewers, and in the inspection of house drainage.

2. What are the existing requirements of the model by-laws as to (a) height, (b) thickness of walls, (c) prevention of fire, (d) facilities for the disposal of house refuse in the case of new buildings?

3. Describe a pan closet, a hopper closet and a valve closet; also a D trap, a P tray and an S trap; which is to be preferred respectively? Give your reasons for and against each.

4. Describe two chemical processes for purifying sewage and also its purification by land.

5. If you are called upon to report whether or not the drainage of a house with the sewer has been properly made, in a town which has adopted the model by-laws of the Local Government Board, to what points would you more particularly direct your attention? Illustrate your answer by sketches.

6. If you have to convey the sewage of a district on to land two miles off, and at a level which cannot quite be commanded by gravity, would you prefer to pump it through an iron rising main or to make it flow along a sewer and lift it vertically at the outfall end? What are the considerations that would influence your decision? State the most important advantages and disadvantages of each alternative.

7. Show by sketches the methods of jointing a 4-inch lead soil-pipe, its attachment to a wall and its junction with a 6-inch stoneware house-drain. Give all the dimensions.

8. Point out the advantages and disadvantages of the various sources and modes of water-supply.

9. How is water filtered on a large scale for town supply? Illustrate your answer by sketches, and also state under what circumstances such filtration is likely to purify water.

10. What are the sanitary advantages and disadvantages of the modern systems of street and road-making? Give a brief description of each with sketches?

The following fifteen candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of local surveyor :—Leonard William Barnard, 38 Bark Place, W.; Albert John Davies, 154 Severn Road, Cardiff; Llewellyn

Davies, Priory House, Albany Road, Cardiff; Henry Ermrich, 106 Sebert Road, Forest Gate, E.; Thomas George Fisher, 33 Mount Street, Grosvenor Square, W.; Wm. Henry Joseph Gathercole, Public Health Department, Guildhall, E.C.; Edward Hebdon, 11 Llanion Terrace, Pembroke Dock; Thomas Briggs Hunter, Grove Road, Windsor; Charles John Kilgallin, Court House, Marylebone, W.; Ernest Ward Lashmore, 57 Denzil Avenue, Southampton; John Henry Leverton, 45 Lisburne Road, Hampstead, N.W.; James Joseph Lyon, 6 Rice Lane, Walton-on-the-Hill, Liverpool; Edward Albert Schneider, 5 Invicta Road, Westcombe Park, Blackheath; James Taylor, 17 Oxford Street, Hereford; Frederick Charles Uren, 19 Cornwall Terrace, Penzance.

A VIENNESE HAILSTORM.

A CORRESPONDENT of the *Daily News*, writing from Vienna on the night of the 8th inst., says the Viennese refuse to believe that anyone living has ever witnessed such a hailstorm as that of yesterday. It caused so many accidents and such vast devastation that when it was over the city looked as if a hundred explosions had taken place at the same time. All the windows in the city facing the wind may be said to have been smashed—a million panes of glass perhaps. The layers of paint with which the bricks are covered have fallen off in large pieces, giving the houses a dilapidated appearance. Gardens, parks, public walks and avenues are destroyed, the ground under the trees being covered with a thick carpet of leaves, which during the whole forenoon was pale under the hailstones that lay many inches deep upon them. Flower-beds look as if thousands of ruffians' boots had trampled upon them, and the gravel walks have been completely washed away. The pavements all over the town glittered with millions of glass fragments. In the public gardens dead pigeons, blackbirds, thrushes and sparrows covered the ground. The hailstones came so thick that in a moment the openings into the subterranean canals were stopped up, and the water rushed wildly into cellars and underground habitations. The planks which frame the shores of the river Wien were quickly broken down and pulled up to let the water escape into the bed of the river. This was swollen to an extraordinary height and breadth, and brought with it uprooted trees, bushes, fences and doors. The hailstones, when swept up and shovelled together lay in heaps

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from 3 to 5 feet high in all the streets of the central town and along the whole expanse of the Ring.

Previous to the storm there had been a great deal of lightning. Then the clouds took a strange yellow colouring, and, coming from two sides, met just over Vienna. Then it grew dark and began to rain. Suddenly the rain changed to hail. Large stones came pattering upon the windows, but before we had time to notice them much or wonder at their size they increased in number and grew to the size of large cherries. They smashed the glass as they fell, flying across the space between the outer and inner windows, breaking the latter and falling heavily into the room. Glass and porcelain that stood on tables in the middle of the rooms were broken by hailstones that had already passed through two windows. In most houses the servants dared not let down the blinds, because showers of glass and ice threatened the face and hands. Through the broken windows hail and rain rushed into the rooms, flooding them and making the occupants doubtful, when all was over, where to begin the work of clearing. In every room heaps of hailstones were swept together. The moderately-sized house I live in had a hundred and twenty-two panes broken, the Theresianum Academy a few less than a thousand, and some steam mills four thousand. On the Ring there are some houses where not a pane was left whole.

At the most critical moment while darkness prevailed the electric light went out. The machines had been stopped because large quantities of water had poured into the engine-rooms. At the Imperial Burg about six hundred large windows were smashed. At the Town Hall many of the beautiful Queen Anne windows are heaps of broken glass, and at the Votive Church one of the huge windows of painted-glass is smashed. In many schools the children were sent home, as the teachers could not keep them in windowless rooms. There is no saying when the glaziers of Vienna will get through their work or whether the material they have at their disposal will suffice. No doubt some people will have to wait a long time before they get their panes mended. Already the village trick of sticking paper across the broken windows is being resorted to in the most fashionable parts of the town. As soon as the extent of the damage had been perceived, the question arose on all sides who was to pay, and many went to the police stations to ask, but received doubtful or unsatisfactory answers. The newspapers have cleared up all doubts by quoting the law which makes the landlord responsible for damage of this kind.

It is estimated that two hundred persons were hurt in all.

The majority had legs broken. It is believed that the glass smashed will take a fortnight or three weeks to mend. There are glazing firms who have orders on their books for 12,000 panes and more. At the Great Central Hospital 10,000 panes are broken. The windows have been closed with blankets at night, but as a very low temperature has set in this state of things is not without its dangers and is very uncomfortable.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10210. Shirley Howard Brierley, for "An improved water-waste preventing syphon cistern."

10224. Karl Schauer, for "Sanitary paper covering for closet seats."

10232. James Robson, for "Improvements in ears or lugs of rain-water and vent pegs."

10243. Richard Douglas Bailey, for "Improvements in and appertaining to harness and horseshoes."

10254. George James Cole, for "Self-acting catch for doors, gates and the like."

10275. John Henry Vidal, for "Improvements in the flushing of water-closets."

10309. Eliza Rippingille and William Brandon, for "Improvements in or connected with hot-air or hot-water heating apparatus in connection with stoves and kitcheners."

10352. Edward Blum, for "Improvements in cocks for bath and other purposes."

10593. Eugen George Charles de Beaulieu, for "Improvements in wall-papers."

10609. John Johnston Green, for "Improvements in the methods of glazing bricks, blocks, tiles and the like."

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THE

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SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 19, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERDEEN.—June 22.—For Additions to Central Public School. Messrs. Jenkins & Marr, Architects, Aberdeen.

ARTHRINGTON.—June 25.—For Building Wesleyan Chapel and School. Mr. W. H. Beevers, Architect, 25 Bond Street, Leeds.

BEAUMONT.—June 25.—For Carrying-out Water Scheme. Mr. Joseph Graham, Engineer, Devonshire Street, Carlisle.

BELFAST.—June 25.—For Building Goods Shed on each Quay of New Branch Dock. Mr. G. F. L. Giles, Harbour Engineer, Belfast.

BEVERLEY.—June 26.—For Building Porter's Lodge and Casual Wards at Workhouse. Messrs. Hawe & Foley, Architects, Beverley.

BOWLING.—June 30.—For Weaving Shed, Warehouse, Engine-house, Boiler-house, Chimney, Reservoir, &c. Mr. Sam Spencer, Architect, 344 Great Horton Road, Great Horton.

BRAMLEY.—June 26.—For Construction of Passenger Station, &c. The Engineer, G.W.R. Station, Reading.

BRECON.—June 23.—For Erection of a Strong Room. Mr. H. Edgar Thomas, County Hall, Brecon.

BROMLEY.—June 26.—For Fittings to the Free Public Library. Messrs. Potts, Son & Hennings, 1 Furnival's Inn, E.C.

BUBWITH.—June 23.—For Restoration of Church. Mr. C. Hodgson Fowler, Architect, The College, Durham.

BUCKLAND BREWER.—June 28.—For Additional Arch to Glen Cottage Bridge. Mr. H. Masterton, County Surveyor, 111 Boutport Street, Barnstaple.

BURLEY.—July 12.—For Building Isolation Hospital, &c. Mr. A. Hill Parker, Architect, 5 Foregate Street, Worcester.

BURNGULLOW.—June 26.—For Construction of Railway Station, &c. Mr. G. K. Mills, Secretary, Paddington Station.

BURY.—July 2.—For Erection of Buildings for Central Electric Station. Mr. J. Cartwright, Borough Engineer.

BURY.—Foundations for Salisbury Club. Mr. Alf. Hopkinson, Architect, 15 Augur Street, Bury.

BUSHEY.—For Construction of Foundation Work for the New Clergy Orphan School at Merry Hill. Messrs. A. Waterhouse & Son, 20 New Cavendish Street.

CARRICK-ON-SUIR.—June 27.—For Building Franciscan Convent. Mr. Walter G. Doolin, Architect, 20 Ely Place, Dublin.

CHESTER-LE-STREET.—June 26.—For Building Cemetery Chapels, Lodge, Mortuary, &c. Messrs. Cowe, Architects, Lambton Grange, Fence Houses, Durham.

CHIPPING BARNET.—June 22.—For Erection of an Entrance Lodge to Proposed Burial Ground. Mr. F. A. Milne, 2 Park Road, Barnet.

CLENCHWARDEN.—June 23.—For the Erection of Board Schools and Master's Residence. Mr. Herbert Green, Architect, Norwich.

COWLING.—June 22.—For Building Villa. Mr. Jas. Hartley, Architect, Arcade Chambers, Colne.

CROYDON.—June 26.—For Supply of Coals and Coke for use at the Waterworks, also for Laying about 5,000 Yards super of Tar Paving. Mr. C. M. Elborough, 8 Park Street, Croydon.



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CROYDON.—July 2.—For the Erection of a New Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

DARENTH.—June 26.—For Building Staff Block, Additions, &c., to Laundry at School for Imbeciles. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DERBY.—July 9.—For Additions to Municipal Technical College. Messrs. Waller & Son, Architects, 17 College Green, Gloucester.

DUNFERMLINE.—June 30.—For Alterations to U.P. Church and New Halls. Mr. Robertson, School-house, Halbeath, Dunfermline.

ETON.—June 26.—For the Supply of Sixty Fathoms of Swedish Yellow Deals and Batten Ends. Mr. R. H. Barrett, Clerk to Guardians, Slough.

EDINBURGH.—July 3.—For Building Public School, Broughton. Mr. Robert Wilson, Architect, 3 Queen Street, Edinburgh.

ELSWICK CEMETERY.—June 30.—For Works to Buildings. Mr. George Thompson, 1 Newgate Street, Newcastle-on-Tyne.

EXETER.—For Repairs to Stables, for Feoffees of St. Mary Arches Parish. Mr. James Jerman, Architect, 5 Bedford Circus, Exeter.

EXETER.—June 23.—For Repairs at Lower Market. The City Surveyor, 18 Bedford Circus, Exeter.

FEATHERSTONE.—June 22.—For Building Villa. Mr. W. H. Fearnley, Architect, Station Lane, Featherstone.

FLEETWOOD.—June 30.—For Reseating Portion of Parish Church. Mr. W. Gornall, Albert Square, Blackpool.

FRITHAM.—June 25.—For Building House. Mr. R. W. S. Griffiths, Evesworth Lodge, Lyndhurst.

GLOUCESTER.—July 2.—For Altering Existing Offices. Erection of Council Chamber and other Works at Shire Hall, Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GOLDSPIE.—June 30.—For Construction of Pier. Mr. James Barron, Engineer, 166 Union Street, Aberdeen.

GOWERTON.—June 29.—For Building Intermediate School. Mr. T. P. Martin, Architect, Heathfield Street, Swansea.

HALIFAX.—June 26.—For Building Liberal Club. Mr. Medley Hall, Architect, Crossley's Buildings, 29 Northgate, Halifax.

HANWELL.—June 25.—For Supply of Broken Jersey of Channel Islands Granite. Mr. W. S. James, Local Board Offices, Hanwell, W.

HARROGATE.—June 28.—For Building Detached Residence, The Duchy Estate. Mr. T. Butler Wilson, F.R.I.B.A., Architect, Leeds and Harrogate.

HARWELL.—June 28.—For Building Board Schools. Mr. E. B. Ormond, Clerk to the Harwell School Board, Wantage.

HAWKINGE.—June 25.—For Enlarging Board Schools. Mr. W. Charles James, 7 Radnor Park Crescent, Folkestone.

HEMSBY.—June 25.—For Additions to National Schools. Mr. Arthur S. Hewitt, Architect, 10 Regent Street, Great Yarmouth.

HIGH SPEN.—June 25.—For Building House and Business Premises. Mr. T. C. Nicholson, Architect, 24 Grainger Street West, Newcastle-on-Tyne.

HORNCHURCH.—June 27.—For Erection of Cottage Homes and Construction of Road and Sewer. Mr. F. J. Smith, F.R.I.B.A., 173 Great George Street, S.W.

ILFORD.—June 25.—For Building Two Cottages, &c. Mr. Peter Watkins, Surveyor to the Local Board, Ilford.

JESMOND.—June 25.—For Additions to The Willows, Mr. Frank Caws, Architect, 22 Fawcett Street, Sunderland.

KEIGHLEY.—July 2.—For Extension of Victoria Hotel. Messrs. W. H. & A. Sugden, Architects, Low Street, Keighley.

KING'S LYNN.—June 23.—For Building Board School, &c. Mr. Herbert Green, Architect, Norwich.

KINSON.—July 7.—For Building Police Station and Justice Room. Mr. Walter J. Fletcher, County Architect, Wimborne.

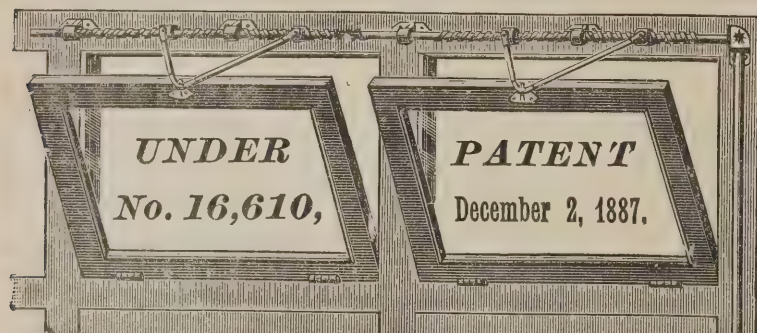
LEEDS.—June 27.—For Construction of Retail Fish Market, with Wrought-iron Roof. The City Engineer.

LEES.—June 27.—For Building Stone Boundary Wall to Cemetery. Messrs. Blackburne, Page & West, Surveyors, Union Street, Oldham.

LANGATTOCK.—June 29.—For Additions to Board School. Mr. W. Haines, The Bryn, near Abergavenny.

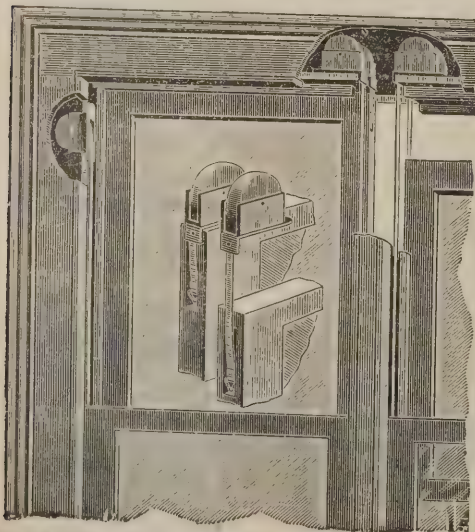
LYTHAM.—June 25.—For Grand Stand and Yard. Mr. J. Allen Parkinson, 5 Chapel Street, Preston.

MILDENHALL, SUFFOLK.—July 11.—For the Erection of Workhouse and Infirmary. Mr. Frank Whitmore, Chelmsford.



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MILTON.—June 26.—For Building Wing, &c., at Infectious Diseases Hospital. Mr. Alexander Hellard, Town Clerk, Town Hall, Portsmouth.

MURTHLY.—June 28.—For Additions to Perth District Asylum. Mr. David Smart, Architect, Perth.

NEWBRIDGE.—June 22.—For Iron Bridge. Mr. William Tanner, County Surveyor, Newport, Mon.

NEW BROMPTON.—June 23.—For Building Two Dwelling Houses. Mr. Rickards, 83 Kingswood Road, New Brompton.

NEWPORT.—July 2.—For Construction of Storage and Intake Reservoirs, Tunnels, &c. Mr. Conyers Kirby, Engineer, Stow Chambers, Newport, Mon.

NEW ROSS.—July 12.—For Building National School. Mr. Walter G. Doolin, M.A., Architect, 20 Ely Place, Dublin.

NORTHAMPTON.—July 2.—For Additions to Workhouse Vagrant Wards. Mr. J. Piccaver, Architect, 7 Wood Hill, Northampton.

NORWICH.—For Supply of Oak Screens and Fittings for Monuments. Messrs. E. Boardman & Son, Queen Street, Norwich.

OLD WHITTINGTON.—For Building Wesleyan Chapel and School. Mr. Blake, Architect, Salter Gate, Chesterfield.

OSWALDTWISTLE.—June 27.—For Alterations to School. Mr. Jonas Turner, Architect, 1 Corporation Street, Accrington.

PEMBROKE.—June 26.—For Additions to Llanion School. Mr. J. E. P. Ladd, Architect, Main Street, Pembroke.

PEMBROKE.—July 2.—For Additions to Welston Court. Mr. Wm. Thomas, Borough Surveyor, Barton Place, Pembroke.

PENARTH.—For Additions to St. Macburn. Messrs. Habershon & Fawcner, 14 Pearl Street, Cardiff.

PENRHUWCEIBER.—June 28.—For Building Methodist Chapel. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

PENTWYNMAWR.—June 25.—For Building Cottages. Mr. Evan Phillips, Dolgwyddfa House, Newbridge, Mon.

PETERBOROUGH.—June 27.—For Works of Repair and Drainage of Gaol. Mr. James Ruddle, Architect, Boroughbury, Peterborough.

PLAISTOW.—July 3.—For Block of School Buildings. Messrs. T. J. Newman & Jacques, Architects, 2 Fen Court, E.C.

RADCLIFFE.—June 23.—For Widening Bridge, &c. The Surveyor, Local Board Office, Radcliffe.

RAWMARSH.—June 27.—For Additions to Horse and Jockey Inn. Mr. J. Platts, Architect, Rotherham.

RUGBY.—June 28.—For Additions to Town Hall. Mr. T. W. Willard, Architect, Rugby.

RUNCORN.—July 6.—For Building Stables. The Secretary, Co-operative Society, 8 Church Street, Runcorn.

SALFORD.—June 28.—For Alterations at Central Market. The Borough Engineer.

TOTTENHAM.—June 26.—For the Repair of Tar and Asphalt Paving. Mr. P. E. Murphy, 712 High Road, Tottenham.

SHOTLEY BRIDGE.—June 23.—For Building Methodist Church and School. Rev. W. Raistrick, Durham Road, Blockhill.

SPILSBY.—June 28.—For Construction of Sewerage Tank, Engine-house, Engine and Centrifugal Pump, at Outfall Works; the Drainage, Laying-out, Trenching and Levelling Sewerage Disposal Grounds; the Supply of Cast-iron Delivery Pipes, Pipe Sewers, Flush Tanks, Manholes, Lamp-holes, &c. Mr. J. E. Butcher, Spilsby.

STAINLAND.—July 4.—For Building Four Houses, Jagger Green. Messrs. C. F. L. Horsfall & Son, Architects, Halifax.

STRATTON ST. MARGARET.—June 23.—For Building Infant School. Mr. William Drew, Architect, 22 Victoria Street, Swindon.

SUTTON.—July 2.—For Internal Cleansing, Distemping, Colouring, Painting, &c., of Dormitories and Day-rooms, at Brighton Road Schools. Mr. Martin, Superintendent.

SWANSEA.—July 26.—For Alterations to 7 Temple Street. Messrs. J. P. Jones, Rowlands & Margrave, Architects, 58 Wind Street, Swansea.

TAUNTON.—June 26.—For Construction of Waiting-rooms, Goods Sheds, Cattle Pens, Retaining Walls, &c., for Great Western Railway Company. Mr. G. K. Mills, Secretary, Paddington Station.

TEWKESBURY.—July 2.—For Additions to Workhouse. Mr. H. A. Badham, Clerk.

THAME.—June 26.—For the Supply and Laying of about 3,000 Feet of Pavement. Mr. Henry Rowland, Surveyor, Thame.

TORQUAY.—June 26.—For the Erection of a Promenade Pier. Mr. H. A. Garrett, A.M.I.C.E., Town Hall, Torquay.

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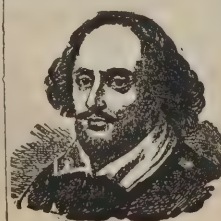
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TOTTENHAM.—June 26.—For Supplying and Fixing Wrought-iron Boundary Fence, Stays, Large and Small Entrance Gates, &c., for Bruce Castle Park. Mr. P. E. Murphy, 712 High Road, Tottenham.

TOXTETH PARK.—July 2.—For Building Fire Station. Mr. John Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park.

TRENTISHOE.—June 25.—Farm Buildings. Mr. Alfred Berry, Dean, Trentishoe, Devon.

WALTHAMSTOW.—June 26.—For the Erection of Additional Cloak Rooms and for Sundry Repairs at Board Schools. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—June 29.—For the Erection of a Fire Engine Station. Mr. Geo. W. Holmes, M.I.C.E., Town Hall, Walthamstow.

WANDSWORTH.—June 26.—For the Supply of 160,000 Wood Blocks and about 80 Tons of Portland Cement and 500 Cubic Yards of Thames Ballast. Mr. Henry J. Hills, East Hill, Wandsworth.

WESTMINSTER.—June 22.—For Erection of Officers' New Quarters and Works in Connection therewith at Workhouse in Poland Street. Messrs. J. Waldram & Sons, 13 Buckingham Street, W.C.

WESTON PEVEREL.—June 28.—For Repairs, Camel's Head Bridge. Mr. C. G. S. Acock, County Surveyor, Totnes.

WILLIAMSTOWN, CO. GALWAY.—July 3.—For Building Residence, &c., for Dispensary Doctor. Mr. C. Mulvany, C.E., Castlereia.

WOODFORD.—July 2.—For Erection of Pathological Buildings at the Claybury Asylum. Mr. G. T. Hine, 35 Parliament Street, S.W.

YARMOUTH.—June 23.—For Extension of National Schools. Mr. John Fowle, Architect, Bouldnor-on-Sea, Yarmouth, Isle of Wight.

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J. & J. Robson, Newcastle	263 2 11
G. E. SIMPSON, Newcastle (accepted)	244 17 6
Surveyor's estimate	260 0 0

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For Additions to Premises, Bromsgrove, for Mr. W. Price.	
Mr. W. H. WARD, Architect, Birmingham. Quantities by Architect.	
Sapcote & Sons	£697 0 0
Morris & Atkinson	666 0 0
Surman & Sons	660 0 0
W. Bloore	650 0 0
T. Rowbotham	625 0 0
W. & J. Webb	618 0 0
R. M. Hughes	561 0 0
W. Bishop	557 0 0
SMITH & PITTS (accepted)	545 0 0

BRIGHTON.

For Additions to Ditchling Road School, for the Brighton and Preston School Board. Messrs. T. SIMPSON & SON, Architects, 16 Ship Street, Brighton.	
Battley, Sons & Holness, London	£2,872 0 0
W. Taylor, Brighton	2,850 0 0
Huntley Bros., Croydon	2,825 0 0
Saunders & Sons, Brighton	2,812 17 3
Sutton & Evershed, Brighton	2,675 0 0
P. Peters, Horsham	2,665 9 0
LONGLEY & CO., Crawley (accepted)	2,410 0 0
For Additions to St. Paul's Schools, Brighton, for Rev. A. D. Wagner. Messrs. T. SIMPSON & SON, Architects, Brighton.	
G. R. Lockyer, Brighton	£2,373 0 0
Stimpson & Co., London	2,250 0 0
W. & T. Garrett, Brighton	2,235 0 0
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 H. J. Linzell 3,773 0 0
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For Construction of Storage Water Reservoir, for the Buxton Local Board. Mr. JOSEPH HAGUE, Engineer, Town Hall, Buxton.

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 G. Lawson & Sons, Edinburgh 19,510 0 0
 C. J. Wills, Manchester 16,813 10 5
 E. Tempest, Matlock Bridge 16,280 0 0
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 J. & T. Young, Baildon 15,221 17 9
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For Building Block of Business Premises, Residence, with Stables, Workshops, &c., Priestpottle, Hexham, for Mr. E. S. Lee. Messrs. MARSHALL & DICK, Architects, 4 Northumberland Street, Newcastle.
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 J. Elliott, Newcastle 2,290 0 0
 J. C. Hope, Newcastle 2,121 17 6
 E. Snowball, Hexham 2,120 10 0
 H. Brown & Co., Newcastle 2,064 0 0
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 W. & J. Darlington, Hexham 2,003 9 4
 A. Bruce, Newcastle 1,857 8 0
 T. Hutchinson, Newcastle 1,844 5 7
 J. HERDMAN & SON, Hexham (*accepted*) 1,755 6 1

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For Alterations and Additions to King's Head Inn, High Wycombe, for Messrs. Leadbetter & Bird. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, London, S.W., and High Wycombe.

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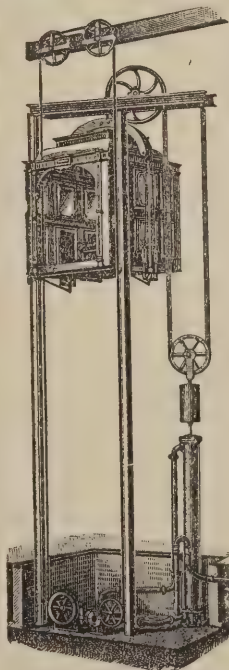
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Dorey & Co., Brentford	37,408 0 0		30,216 0 0
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T. J. MESSUM, Twickenham (accepted)	36,069 0 0		29,874 0 0

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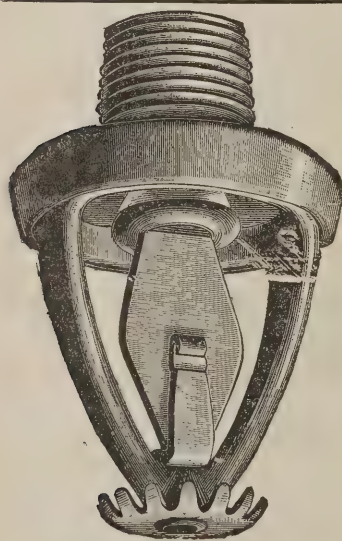
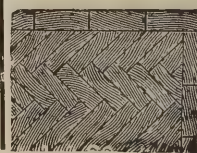
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H. King, Lower Seymour Street	500 0 0
T. Bendon, Hammersmith	498 0 0
J. Riley, North Street	482 0 0

For Extensive Sewerage Works in a Portion of the Strand and Streets to the South thereof, known as the Adelphi, for the Vestry of St. Martin's-in-the-Fields. Mr. CHAS. MASON, Engineer, Town Hall, Charing Cross Road. Quantities by Mr. W. T. FARTHING, 46 Strand.

J. Neave, Forest Hill	£24,420 0 0
J. Band, Grays	13,880 0 0
A. Kellett, Willesden	13,453 2 0
T. Adams, Wood Green	13,212 7 0
J. Mowlem & Co., Westminster	12,982 0 0
E. Iles, Mitcham	12,957 0 0
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J. H. NEAVE, Fulham (accepted)	9,690 16 4

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Massey & Sons, Alderley Edge	£192 0 0
G. Dawson, Stockport	185 0 0
Tate & Gorden, Manchester	150 0 0
J. Foden, Withington	145 0 0
T. BLACKSHAW, Mobberley (accepted)	144 0 0

MANCHESTER.

For Street Improvement Works, Old Trafford. Mr. JOHN BOWDEN, Surveyor, 14 Ridgefield, Manchester.	
J. D. Nowell, Stretford	£3,316 11 2
G. Freeman, Oldham	2,907 0 0
R. E. Jones, Patricroft	2,514 0 0
M. Naylor & Sons, Hulme	2,324 17 6
G. Clarke, Hulme	2,233 0 0
G. BOZSON, Ashton-on-Mersey (accepted)	2,000 0 0

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D. LEWIS, Llanithel (accepted)	£3,410 0 0
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Rutter, Barry, near Cardiff	30,450	0	0
Curral & Lewis, Birmingham	29,948	0	0
Kellett, Willesden Junction	27,385	0	0
Nadin, Sheffield	26,523	5	6
Neave, London	25,750	0	0
Osenton, Westerham	25,641	0	0
Farl & Briggs, Derby	25,493	4	7
Nevitt, Stafford	24,400	7	11
Jones & Fitzmaurice, Birmingham	24,150	0	0
S. & E. Bentley, Leicester	24,102	2	0
Thomson, Avonmouth	24,039	0	0
Philbrick, Leicester	24,000	0	0
Holloway, Wolverhampton	23,129	17	0
Bell, London	22,620	0	0
Nowell, London	21,883	8	6
Dickson, London	21,344	15	1
Tempest, Newchurch	21,328	15	0
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Band, Grays	20,000	0	0
Barke, Stoke-on-Trent	19,705	0	0

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Phillips	£1,220	0	0
ALLEN & SONS, Taunton (accepted)	976	10	0
Surveyor's estimate	1,025	0	0

WATTSTOWN.

For Building Baptist Chapel, Wattstown, Wales.

Rees Bros.	£1,940	0	0
C. JENKINS & SON, Porth (accepted)	1,935	0	0

WEST BRIDGFORD.

For Building Boys', Girls' and Infants' School in Musters and George Roads, West Bridgford, for the West Bridgford School Board. Mr. FREDERICK BALL, Architect, 5 Hounds Gate, Nottingham.

B. Keeling, Nottingham	£5,589	13	0
W. Donnelly, Kimberley	5,576	10	0
J. Cuthbert, Nottingham	5,524	0	0
W. Youngman, Long Eaton	5,501	0	0
F. Lee, Nottingham	5,500	0	0
W. E. Shaw, Ilkeston	5,496	0	0
Hodson & Son, Nottingham	5,490	0	0
J. Barlow, Nottingham	5,482	0	0
J. Musson, Nottingham	5,475	0	0
Gilbert & Gabbittass, Nottingham	5,400	0	0
H. Scott & Son, Nottingham	5,350	0	0
J. H. Vickers, Nottingham	5,350	0	0
W. Savage, Nottingham	5,337	0	0
S. A. Bell, Nottingham	5,320	0	0
Dennett & Williamson, Nottingham	5,314	0	0
H. Vickers, Nottingham	5,300	0	0
J. Wright, Nottingham	5,295	0	0
J. J. Thomas, Nottingham	5,275	0	0
W. Maule, Nottingham	5,270	0	0
J. Hutchinson, Nottingham	5,250	0	0
T. Whittaker, Nottingham	5,155	0	0
Dennett & Ingle, Nottingham (withdrawn)	5,040	0	0
J. Oxcroft, Nottingham	5,120	0	0

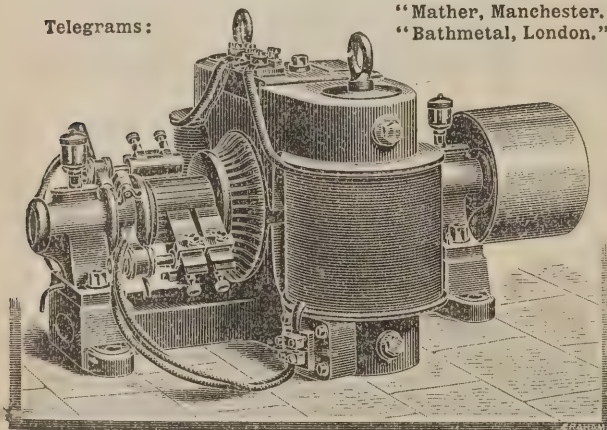
VARIETIES.

THE pier at Uig, in the west of Skye, has now been completed. It has been carried out a distance of 1,040 feet, and permits of steamers calling at all states of the tide.

THE Sevenoaks Board of Guardians have been advised by the Local Government Board inspector to provide additional exits to the infirmary. He states that he generally recommends the fixing of inclined planes to the windows, with a broad wooden platform at the top, so that patients could be easily removed from the windows and put into the "shoots," and thus safely conveyed to the ground. This means of exit commended itself to him by reason of its small cost and the ease with which it could be utilised.

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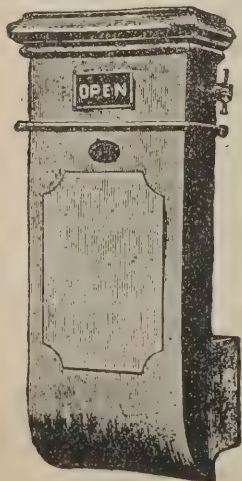
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It has been decided to apply for a Faculty to carry out improvements at St. Mary's Church, Warwick. The proposed works include the taking down of all the galleries, the reseating of the church, and the alterations of the north and south aisles, at a cost of 3,500*l*.

LATELY the Auckland Local Board offered 80*l*. in premiums for the best scheme for the disposal of the town's sewage. Nine competitors entered, and the award has just been given. The first premium of 50*l*. has been awarded to Mr. Beesley, of London, whose estimate is 6,785*l*.; the second, 20*l*., to Mr. Balfour, Newcastle, whose estimate is 8,400*l*.; and the third, 10*l*., to Mr. Perkins, Bishop Auckland, whose estimate is 9,575*l*.

At the meeting of the Dawlish Local Board a resolution was adopted that a committee should be appointed for the purpose of ascertaining whether it was practicable to make a harbour at a moderate expense, and that they should be empowered to take the advice of a competent engineer.

THE fourth excursion of the Edinburgh Association of Science and Art, including members and friends to the number of 160, was made to the paper mills of Messrs. Alex. Cowan & Sons, Limited, at Valleyfield.

At the meeting of the Bolton School Board a resolution is to be submitted to the effect that no architect be entrusted with the work of carrying out the new Higher Grade School who cannot satisfy the Board by actual tenders from responsible builders that the same can be erected in accordance with the plans for a sum not exceeding 20,000*l*., and that the architect who fails in this condition shall not be entitled to any payment beyond that awarded by the assessor.

THE Edinburgh Water Trust have instructed their engineers to inquire into the best practical method of dealing with St. Mary's Loch as a source of supply for the city, with a view to the Works Committee bringing up a report on the respective merits of the loch and the Talla.

A SPECIAL committee of the St. Pancras Poor Law Guardians have recommended the board to take the necessary steps, subject to the sanction of the Local Government Board, to purchase property and land at Margate for the establishment of a convalescent seaside school for children, chargeable to the poor rate. The price of the property is stated to be 6,500*l*.

THE Paisley School Board, it is stated, have fixed on part of Crossflat estate, Glasgow Road, as the site for the new grammar school. The site, it is understood, will cost over 5,000*l*.

THE Hull Town Council, having applied to the Local Government Board for sanction to borrow 63,728*l*. for works of sewage, street improvements, and the formation of new streets, an inquiry, directed by the Board, has just been held in the Town Hall.

A SMALL handbook on "The Manufacture of Glazed Bricks and Glazed Sanitary Ware," published by Mr. H. G. Montgomery, is primarily intended for the use of manufacturers. When it is said that thousands of pounds have been spent in producing the recipes, the value of the information will be evident. The pages will, however, be also found suggestive by architects and builders who have to employ bricks and glazed ware.

THE *Glasgow Herald* says:—At the annual meeting of the Société Nationale des Beaux-Arts, held at the Palais du Champ de Mars, Paris, Mr. James Guthrie, R.S.A., Glasgow, was elected a sociétaire (full member). Mr. Guthrie was elected an associate in 1892.

A NEW "holiday handy book" has been prepared by Mr. Percy Lindley, with the title "Under the British Flag." It explains the facilities for cheap and convenient excursions to Holland, North and South Germany, and Scandinavia, which have been organised by the Great Eastern Company *via* Hook of Holland. Some of the most interesting places are described and illustrated in the bright little guide, which, like the others in the series, should be studied by all our readers who have not yet arranged for their annual holiday.

In the course of a letter to the *Standard* a gas consumer writes:—In reading an account of the meeting of the gas engineers at Westminster, some explanation is now afforded why nearly 90 per cent. of gas consumers are complaining of the large increase of their gas bills. It arises, no doubt, from the increase of pressure in the gas mains, for the purpose of enabling people to use gas-engines.

At the meeting of the Glasgow Police Commissioners, in connection with the sewage disposal works, it was agreed that, having regard to the treatment of sewage from other parts of the city, the services of Mr. Alsing, engineer of the works, should be retained at a fee of 250*l*. per annum on condition that he agree to be available to the Commissioners at all times for carrying out these schemes.

THE sea wall, which has been erected by the Local Board at Filey to prevent the inroads of the sea, at a cost of 15,000*l*., has been formally opened by Lord Herries, the lord-lieutenant

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of the East Riding. Mr. Fairbank was the engineer, and Messrs. Dickson were the contractors.

A MOVEMENT is on foot for throwing open to the public Bessborough Gardens, situated by the Middlesex side of Vauxhall Bridge and close to the site of the New National Gallery of British Art, which is shortly to be erected.

BUILDING AND BUILDERS.

By the renewed mediation of Messrs. W. Sugden & Son, architects, the strike in the building trade at Leek has been brought to a conclusion by the signing of an agreement between the representatives of the Masters' Association and the Labourers' Association, which makes 4½d. an hour the standard rate of wages and postpones the question of further advance for the present year, a Conciliation Board to be formed of four members of each side, with power to select an umpire, within one month.

It is stated that considerable dissatisfaction has for some time been expressed amongst those engaged in the building trades of the Todmorden district in opposition to the by-laws enforced by the Local Board. It is urged that the by-laws are so framed that building operations are at a comparative standstill, and the effect has been that the joinery, masonry and other businesses are thereby very dull, many of the hands in those trades having to play a good deal for want of work.

PLANS have been passed at the Coatbridge Dean of Guild Court for the erection of a Roman Catholic Church on the site of the present building at the corner of Main Street and St. John Street. The plans are by Messrs. Pugin & Pugin, London. The cost is estimated at between 7,000*l.* and 8,000*l.*

At the meeting of the Edinburgh Dean of Guild Court five warrants were granted, and among these the city received warrant to erect a fire-engine house at Angle Park Terrace, which will take the place of the wooden box which does duty there at present. It will be a two storey building built of stone, and will be situated a little more to the east than the present erection.

THE Glasgow Dean of Guild Court recently granted the Town Council, as improvement trustees, a lining to erect a "Family Home" in St. Andrew Street. Objections were

lodged at the time by Mr. John Dove, a neighbouring proprietor, and he has now taken the matter to the Court of Session for settlement. The plans show a building extending beyond Mr. Dove's premises.

It is announced by the *Tablet* that an appeal will shortly be made for funds to construct the Westminster Cathedral, which it has been decided "is to be in the ancient Basilica style." Owing to "the admitted impossibility of rivalling the glories of the neighbouring Abbey," Constantine's church of St. Peter has been chosen as a model, for "in no other style could the shell of a church of cathedral dimensions be erected for so little cost."

PLANS for new offices for the accommodation of the staff of the sanitary department have been approved by the Glasgow Police Commission, at an approximate cost of 17,000*l.*, the old offices in Montrose Street having been long found totally inadequate.

At the Ardrossan Burgh Court a builder, Mr. Angus Kennedy, has been fined 2*l.* He was charged with having permitted one of a number of houses erected by him in rear of South Crescent, Ardrossan, to be occupied before having obtained a certificate as to their fitness for occupancy from the burgh surveyor. The surveyor whom he had called to examine them withheld the certificate as the buildings were not completed. For defence it was stated that Kennedy was not the owner but simply the builder of the property, a sale having been effected; but the Court held that they had not to consider whether Kennedy was proprietor and builder or builder only.

THE new wing of the convalescent hospital at Cookridge, erected by public subscription in memory of Canon Jackson (Ripon) of St. James's Church, Leeds, from the designs of Mr. W. A. Hobson, of Leeds, has just been opened.

WE have received a specimen of the estimating slips devised by Mr. E. J. Sadgrove, surveyor, Surrey Street, Strand. The following are a few of the advantages claimed:—An enormous saving of time in preparing estimates from specifications. Place one slip on the left-hand margin of the specification and price the items in the usual manner. The left-hand column of the slip may be used for any abbreviated quantities or notes. The pages can then be totalled and carried to the summary, thus saving the usual procedure of booking, which generally means practically re-writing the specification. If the contractor is unsuccessful in estimating and has to return the specification to the architect, he will detach the slips, pin them

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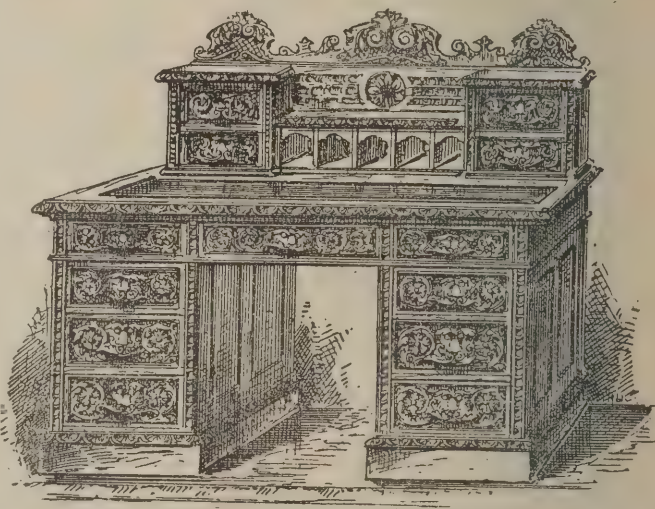
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in the summary, endorse and put away, saving the usual unnecessary pile of papers. The slips should be paged to correspond with the page of specification, and if future reference be required and the specification produced, it can be seen at a glance to which item any individual price refers.

THE Keighley Guardians have been informed that the Local Government Board recommend the expenditure of 16,000*l.* on a new workhouse rather than an outlay of 9,000*l.* on altering and enlarging the present premises.

TRADE NOTES.

THE whole of the old hot-water piping in the conservatories at Chatsworth have been taken out to be replaced with "Richardson's" patent universal indiarubber expansion joint pipes, of which the Meadow Foundry Company, Limited, Mansfield, Notts, are the sole makers, and the work of renewal has already commenced.

WE hear that Messrs. Hayward Tyler & Co., of Whitecross Street, London, have been instructed to supply the whole sanitary and bath arrangements of a large naval hospital for a foreign Power in the Pacific. The closets adopted are their well-known "Tylerox" pattern, except in one ward, where the "Turkish" pattern is used. The baths are all on wheels for conveyance into the wards if needful.

THE Acorn Board Schools, York, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE have much pleasure in announcing that owing to increase of business Messrs. Clark, Bunnett & Co., Limited, have been compelled to move their offices from Rathbone Place, W., and King Street, Cheapside, to larger and more commodious offices at Queen Street, Cheapside, London, E.C., where all communications should be addressed.

AT the meeting of the gas and electric lighting committee of the Bolton Corporation, the electric engineer reported that the mains had been laid in a considerable portion of the supply area and that applications had been made for current to the extent of 1,200 eight c p. lamps.

ILLUSTRATIONS.

FREE PUBLIC LIBRARY, EDINBURGH.—REFERENCE-ROOM.

SCHOOL BOARD OFFICES, READING.

HOUSE AT WREXHAM.

BALLARD, COOMBE WARREN, SURREY.

ELECTRICAL.

THE Edinburgh authorities have made arrangements for laying the foundation-stone of the electric-light station on Monday, 25th inst. There will be a dinner in the council chambers afterwards, and later a popular lecture in the Albert Hall at 8 o'clock by Professor Kennedy, the consulting electrical engineer.

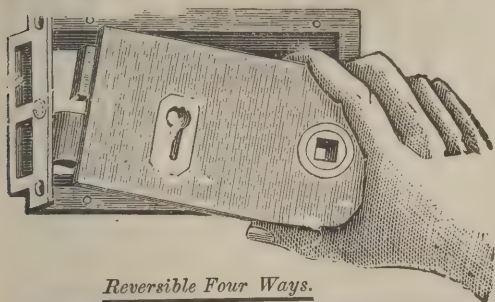
IT is proposed by the Yarmouth Town Council to introduce the electric light in Gorleston and Southtown as well as in Yarmouth.

THE electric-lighting committee of the Coventry Town Council have accepted the tender of Mr. Chas. Gray Hill for the erection in Sandy Lane of an electric-lighting station for the sum of 6,649*l.* The architects are Messrs. G. & I. Steane, and Mr. R. Hammond is the consulting electrical engineer. The buildings are to be commenced at once, and the necessary power and plant, with mains through the principal streets, are to be installed simultaneously.

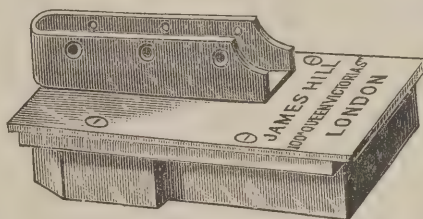
IT is stated that Mr. Assheton Smith is having a survey made with the view of constructing an electric railway to the summit of Snowdon.

AT the meeting of the Bedford Urban Sanitary Authority a report submitted by the electric-light committee was adopted. It recommended "That application be made to the Local Government Board for sanction to borrow the sum of 12,000*l.* for providing the necessary buildings, machinery and plant for supplying electrical energy within the borough for all public and private purposes, in accordance with the plans and estimates prepared by Mr. F. H. Medhurst."

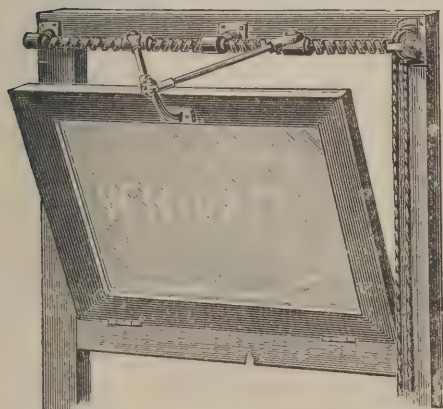
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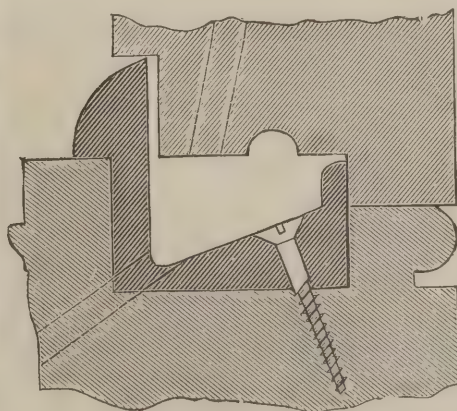
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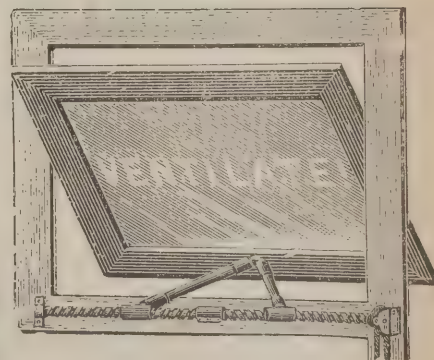
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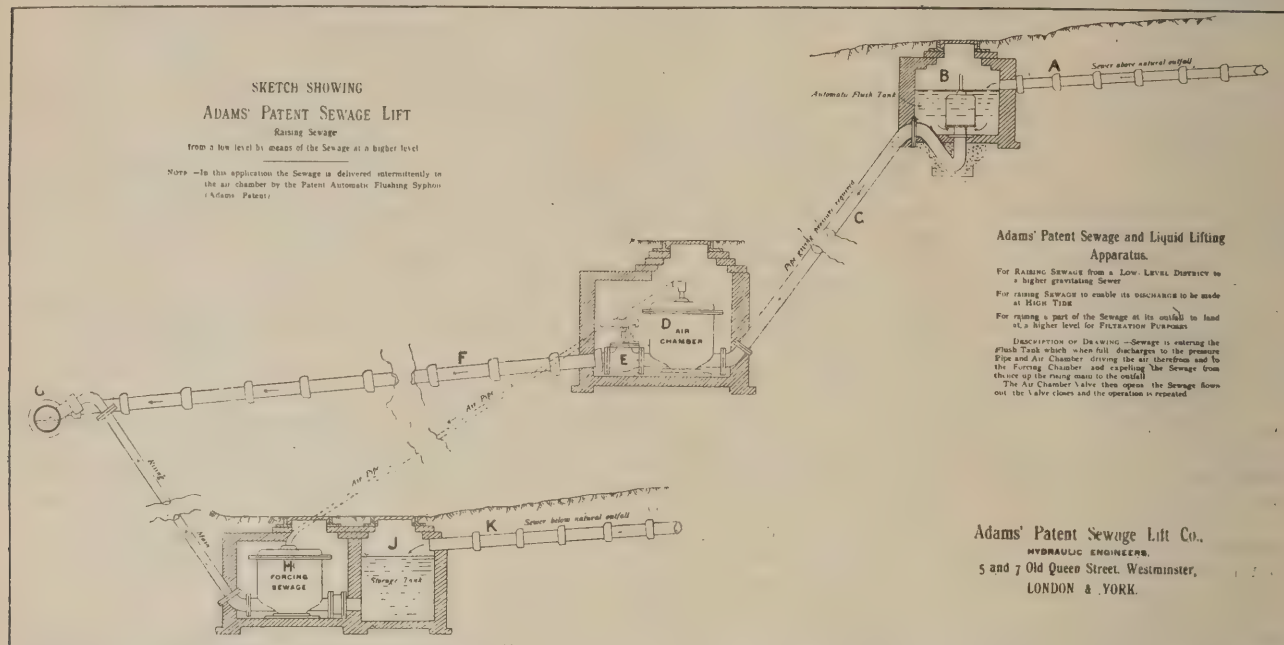
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NOTES ON NOVELTIES.

Adams's Patent Sewage and Liquid Lift.—We give an illustration of one of the latest additions to the science of sanitary engineering in the apparatus known as the Adams's patent sewage lift, as constructed by the Adams's Patent Sewage Lift Company, of 5 and 7 Old Queen Street, Westminster, and of York. By this apparatus the high-level sewage of a district at one point is utilised to raise the sewage from a lower area at

country, unless artificial means be resorted to to obtain the required "head." We have had the opportunity of personally inspecting the apparatus, and Messrs. Adams may claim the credit of applying the principle of raising liquid by liquid to the present purpose, *i.e.* of raising sewage at one point by a "head" sewage at another point.

The apparatus itself is extremely simple. It consists at the higher level of a flush tank A, fitted with Messrs. Adams's patent sewer flushing syphon. This syphon is so well known



another point, entirely without the use of steam-engines or other like motive power; any sewage thus lying below the outfall is automatically raised thereto. An essential factor, however, where this apparatus is employed is the existence of an available "head" of sewage (or liquid) at another point, wherewith the low-lying liquid may be raised; this then makes the adoption of the lift impracticable in perfectly flat

as hardly to need description in detail. The liquid, however, collects in this tank; the air within the syphon is gradually compressed by the rising liquid (as it cannot escape through the deep-water seal at outlet). The air thus compressed resists the pressure of liquid, which thus rises above the syphon to pass through the syphon, as it otherwise would, until the syphon itself is completely submerged and liquid stands some inches

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There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

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AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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above it. The increasing weight of the water now forces the syphon, the compressed air is driven up the vent-pipe and the syphon comes into instant operation—full bore—delivering its contents to the pressure-pipe, which in turn fills the receptacle B. The air from this receptacle is thus expelled and forced through the air-pipe to the receptacle or forcing-chamber C (this chamber is already full of the sewage to be raised, which has entered from the storage tank through the flap-valve shown), and the contents of C are thus forced up the rising main to the outfall sewer at D, at the height required. The operation over, the forcing-chamber C becomes full of air, and the air-chamber full of liquid. The automatic valve on the air-chamber now comes into operation and liberates the liquid therefrom, closing again when the chamber has become empty. The operation of filling and forcing is then continued indefinitely and absolutely automatically, at no cost for maintenance and at but a slight original outlay. The automatic valve on the air-chamber is so constructed that it is closed under the pressure of the column in the pressure pipe, opening by an increase of pressure when the pressure pipe becomes more fully charged, and allowing the contents of C to flow out.

The illustration gives a general plan of the system. At B is the higher level, with available head of sewage; A is the flush tank in which this collects, and whence it is discharged to air-chamber B, driving in turn, and under pressure, the air from this to forcing-chamber C, and C's contents up the rising main to the outfall at D. The flap valve between C and the storage tank prevents the return to storage tank of sewage from C, when the pressure is applied from B. The patentees claim for this apparatus that by thus working intermittently any slight loss from leakage of air-pipe or valves is overcome, and that as the sewage is thrown up in bulk more quickly, there is no fear of any settlement or deposit. Naturally the result is the same whatever relative position the vessels may hold to each other, provided only that the pressure column is either equal to or greater than the height through which the sewage is forced, and that there is a natural outfall for the liquid from the air-chamber.

The distance separating the chambers also may be greater or less to suit the conditions of the district to which the system is applied. The Adams lift has many applications, as to raise sewage at one level by sewage at another level; to raise sewage at a low level by water from a canal; to raise sewage at its outfall by the sewage itself for irrigation purposes; to raise liquid chemicals, and to raise water, &c., from basements below

the sewer level. The engraving we publish shows the lift as at work in the company's premises, where liquid contained in the storage tank is raised to the height shown by means of the "head" of liquid obtained from the flush tank; from this it will appear that the air and forcing vessels may be on the same level if need be, the position or level of the air-chamber being determined by the level at which the pressure liquid can be disposed of after doing its work.

LONDON BOARD SCHOOLS.

ACCORDING to the report of the Rev. T. W. Sharpe, C.B., senior chief inspector, on the schools in the Metropolitan Division, the supply of school accommodation in London with certain exceptions is now fairly complete. Year by year, however, several new schools each holding a thousand children are rendered necessary by the annual growth of population. These additional schools are chiefly needed in the outer ring; but the supply is liable to be disarranged even where it has been completed, by movements of the population caused by the erection of artisans' dwellings, as at Millbank, while parents in fairly easy circumstances are in growing numbers taking advantage of Board schools for the education of their children in elementary subjects. The inspector's statement on the general supply of London rests mainly upon statistics which claim to represent the accommodation of existing voluntary schools, reckoned upon the floor space of their schoolrooms and classrooms at an allowance of 8 square feet per scholar; but it is pointed out that some deductions should be made from the totals in respect of each district for the ebbing of population, and for unavailable space in ill-planned rooms which cannot be utilised for teaching without considerable structural alterations. Complaint is made of unnecessary delay in recognising the need of building, in getting out plans and in completing buildings; and it is stated that the generally correct basis upon which the School Board relies for its calculations of supply leads to results which do not always fairly represent the actual needs of a locality. Upon this matter there has been much conflict between the parties on the Board. Mr. Sharpe's opinion is that a deficiency of accommodation in one block of streets cannot always be met by a surplus in a neighbouring block. He suggests that where the deficiency, though real, is small and not capable of exact calculation, a temporary iron building

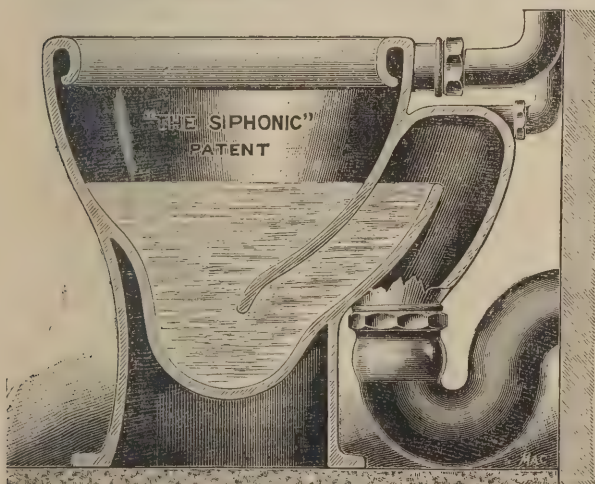
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of a sufficiently substantial character, or the conversion of two or three contiguous houses into a temporary school, is the readiest and most economical plan of testing the real deficiency.

On the subject of buildings we are told that the searching inquiry which is being made into their condition has brought to light a large number of serious defects, but nearly all of these can be remedied without any violent structural alterations. The chief want of Central London, however, is in Mr. Sharpe's view, proper playground accommodation. There are very few schools in which some form of drill has not been adopted. Swedish drill requires a playground or central hall for its full development, and for this reason an adaptation of the drill to the confined space of the schoolroom has been found necessary in the schools which do not possess fair-sized playgrounds. The effect produced upon the carriage and discipline of the scholars by the drill is remarkable, although the conditions of limited space have been unfavourable, some of the playgrounds which have been utilised being little better than large yards. In the whole of Westminster there are not more than four or five schools that are equipped with good playgrounds. In the crowded neighbourhoods the Board schools possess external spaces which are exceedingly small, while the voluntary schools have no playground worthy of the name. Even in the largest of London playgrounds the great number of scholars is a bar to healthy running and to games which can be played by any large number of boys. It is fortunate that there is in most parts of London a park or some open space where the older scholars may have greater freedom out of school hours, but, as the inspector advises, in school time even the smallest space should be utilised for fresh air for refreshing the lungs and regaining the temper.

AUSTRALIAN TIMBER FOR PAVING.

It will be good news for the ratepayers of London to learn that there is a chance of obtaining a quantity of Australian timber for paving without having to pay for it. The following official note on the subject has been sent to the Victorian Government by Mr. C. S. Perrin, the conservator of forests:—

In the matter of red gum blocks for street paving in England and the great cities of the Continent, I have the honour to submit the following suggestions. Red gum blocks can be procured from Gippsland of the very best quality (*Eucalyptus rostrata* and *Eucalyptus tereticornis*) at the rate of 9*l.* 5*s.* per

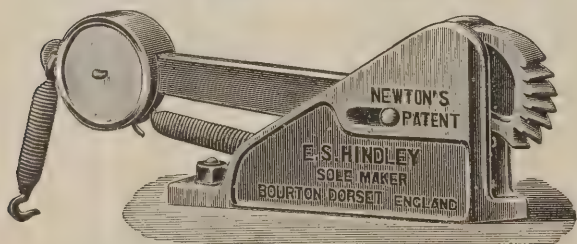
1,000 blocks, delivered f.o.b. at Williamstown, and for 3*s.* less per 1,000 at Port Melbourne. It is quite true, as stated by the Hon. Mr. Reid in his cablegram of March 13, that there is no demand for paving blocks from the colony at present; but I am aware of a general feeling existing among the great Corporations of English and Continental cities as to the desirableness of making some change with regard to the use of soft wood for street paving purposes; hence our hard woods are bound, in the very near future, to command extensive notice from their suitability and durability for the purpose named. Western Australia has for years past sent to London paving blocks of jarrah (*Eucalyptus marginata*). Tasmania has commenced to send blocks and other timber of blue gum (*Eucalyptus globulus*). In my opinion, it is highly desirable that Victoria should be represented in the competition between the colonies for what will be an immense trade in wood blocks.

The West Australian jarrah is well known in the markets of the Old Country, whilst commercially it is the reverse with our red gum, which is practically unknown except to the experts of the Royal Dockyards and a few merchants to whom occasional shipments have been sent. From inquiry I now find that the Murray gum (*Eucalyptus rostrata*), or river gum, is not suitable for paving, and the Metropolitan Board of Works now, after considerable trial, give the preference to Gippsland red gum of the species known as *tereticornis*. The former is full of gum veins and liable to dry-rot, &c., and does not stand the heavy traffic in consequence. I have therefore to recommend that a trial shipment of 5,000 blocks be obtained from Messrs. Quiggin Bros., of Flinders Street, whose mills are situated near Bairnsdale, at a cost, as previously stated, of 9*l.* 5*s.* per 1,000 delivered free on board at Williamstown, or 9*l.* 2*s.* per 1,000 at Port Melbourne, f.o.b. Mr. Martin, secretary for agriculture, whom I have seen, has promised to reserve space for 5,000 blocks if sent in time for the National Show in June next, and these could be shipped with other exhibits.

After the show I would suggest that the blocks be handed over by the Agent-General to the London County Council or other body interested in street paving in London, to be situated in such a place as will provide tests and data for proving the superiority of red gum to West Australian jarrah and Tasmanian blue gum. In fact, a trial space might be laid down in which all the Australian woods could be tested and practically valued as street paving material.

The blocks can be obtained now, and if these suggestions be approved the order can be given at once, and the timber

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WORKS, ROTHERHAM. Estab. 1854.

sent to Mr. Martin for shipment with the other exhibits. I would suggest that in the laying down of these blocks in the streets asphalt be used in place of cement. The former allows for contraction and expansion in cold and hot weather and the latter does not, whilst asphalt also acts as a preservative of the wood. In Melbourne cement has been chiefly used.

PATENTS IN 1893.

THE report of the Controller-General of Patents for the year 1893 has just been presented to Parliament. The number of applications for patents during the year exceeded that of any previous year, having amounted to 25,120, or an increase of about 4 per cent. above the number of applications in 1892. The number of applications has grown steadily since the Act of 1883. In 1884 there were 17,100; the next year, 1885, there was about 100 less, but with that exception the increase has been steady.

The greatest number of applications under the old Act of 1852 was in 1882, when the number was 6,241, or about a quarter of the present number. From 1852 to 1882 the growth had been almost continuous, and had increased from 2,764 in 1854 up to the number given above in 1882. The total number of patents sealed from the date of the passing of the Statute of Monopolies in 1623 down to the passing of the 1852 Act was 13,561. How far this enormous increase in patents for inventions represents any genuine growth in the inventive faculty it would be difficult to say.

The report notes that recent years show a considerable increase in the number of complete specifications filed with the applications, and that every year the number of applications accompanied by provisional specifications, which are allowed to lapse through omission to provide complete specifications, becomes relatively larger. The reduction in the scale of renewal fees, sanctioned in 1892, has caused a small increase in the number of patents kept in force.

The number of patents which perish in the later stages seems to be as large as ever, and the proportion of those which die in the earlier stages appears to be increasing very rapidly. In 1877, 65·8 per cent. remained in force for three or four years. In 1892 the percentage had dropped to 47·8, the decrease being fairly steady throughout that period.

It is a remarkable fact that more than half the patents

applied for are now allowed to perish at so very early a stage in their existence. Of the applications of 1880 only 6 per cent., or 222 out of 5,717 applications (made under the 1852 law) still survive, having lasted the full period of fourteen years.

So far as the tables enable a judgment to be formed, an equal percentage of the patents taken out under the existing law survived to the later stages, although a much larger proportion perished in the first stage. For instance, of the 1886 patents 15·4 per cent. are now in their eighth year, and the percentage of the 1877 patents alive at the same period was 14·2.

The applications for designs show a steady falling off during the past six years, and the same remark applies to the applications for the registration of trade marks. With regard to these there was a steady increase on the passing of the Act in 1883 up to 1888, when 13,315 applications for registration were made. Since then there has been a steady falling off, the number last year being 8,675. The total earnings for the year amounted to 174,877½. The surplus for the year was 79,774½.

CHURCH BUILDING AND RESTORATION.

HEYDON, NORFOLK.—The fine old parish church of SS. Peter and Paul is now about to undergo partial restoration, the principal works being the restoration of the nave and aisle roofs, which have been found to be in a decayed condition, re-using, however, every part of the old woodwork found practicable, taking off and recasting the lead, reglazing the clerestory windows, restoring the copings and walling, rebuilding the east gable, and replastering the internal walls. Part of the amount necessary for carrying out the restoration has been obtained, but further funds are still needed. Mr. T. H. Blyth, of Foulsham, is the contractor, and the works are under the superintendence of Mr. Herbert J. Green, architect, Norwich.

THE Chester Town Council last October selected a site for an electric-light station, and at a meeting just held have rescinded their determination. One member remarked that the electric light had already cost them 754½ *gs. 2d.*, and they had nothing to show for it. They were not a bit more forward than they were nine months ago, and if they went on like this they would spend as much money as they could get the electric light for and still be without it.

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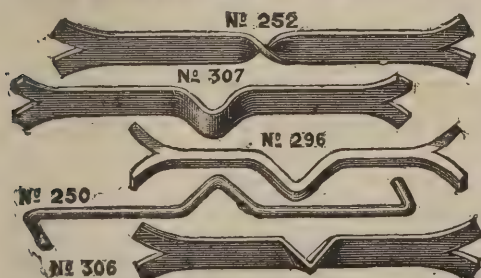
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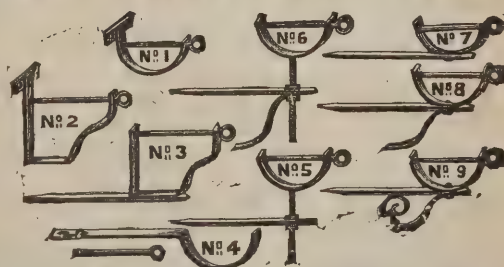
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CEMENTS AND CEMENT-TESTING.*

THE chief qualities which make cement valuable are perhaps the following: setting and hardening properties, constancy of volume, permanence in water and in air, strength under tension and compression, resistance to wear, resistance to frost, impermeability by water and adhesion to brick or stone. Let us now consider the chief uses to which cement is applied, and the special qualities which each use demands. It may be assumed that for all purposes rapid hardening properties and permanence in respect of strength and volume are essential.

1. Mortar and concrete: hardness, strength under compression.

2. Sidewalks and flooring: hardness, resistance to wear and frost.

3. Cistern, reservoir and aqueduct linings: impermeability.

The testing of cements is a delicate operation, and much experience and judgment are necessary in order to secure even fairly accurate results. The methods of testing have been the subject of careful study by experts. In Germany the requirements of the Minister of Public Works are recognised as a standard. In France the requirements of the Services Maritimes des Ponts et Chaussées are generally followed. In America the subject of cement-testing has been carefully considered by a committee of the American Society of Civil Engineers, and their report will be found to contain full and valuable instructions. The German requirements are marked by simplicity, clearness and good sense, and probably represent the latest advances in the field of cement-testing.

We may now take up the chief qualities of cement which it is important to determine, the reasons for the failure of some cements to exhibit these qualities and the methods by which such failure may be most surely and promptly recognised.

1. *Setting and Hardening Properties.*—Cement, when mixed with water until plastic, gradually sets, becoming more or less hard and rigid. Natural-rock cement usually sets in a few minutes, or one-half hour at most. Portland cement requires a longer time, usually from two to eight hours. Cements containing a high proportion of clay, or those lightly burned, are more quick setting than those high in lime or hard burned. The time of setting is most easily determined by making a "pat"

of the cement, about 3 inches in diameter and $\frac{1}{2}$ inch thick, with thin edges, on a piece of glass about 5 inches square. The pat is placed in a tight box or under a damp cloth and tested from time to time, by light pressure with the finger nail, until no noticeable impression is made. The amount of water used greatly influences the time of setting, and different cements require different proportions of water to produce a given consistency. The German requirements prescribe the use of such an amount of water that several taps of the glass on the table or mixing-slab are required to make the pat spread out to the edges. The temperature of the room is also exceedingly important, as cement will set in a warm room in half the time, or less, required in a cold room. The room should be kept as nearly as possible at 70 deg. Fahr. during the mixing and setting, and the water used should be of this temperature. More accurate methods, using a needle one twenty-fourth of an inch in diameter, carrying a weight of 1 lb., are also employed, but are unnecessary for practical purposes.

After remaining twenty-four hours in moist air, or at least over night, the pat is placed in water (kept at 70 deg. Fahr.) and the progress of the hardening noted. Good cement should harden rapidly, and after one day in water should appear perfectly hardened, so that it cannot be scratched or scraped away by the finger-nail. Good Portland cements are slow-setting and quick-hardening. There are many inferior cements which remain soft for several days, though they may become quite hard in time. The best cements are those which gain great hardness within a few days and show no falling-off at long periods.

2. *Constancy of Volume and Permanence.*—The question of the soundness and lasting qualities of cement is perhaps of greater consequence than any other, as the stability of work done with it depends entirely upon this quality. Some cements, though hardening well when first used, show after weeks or months a tendency to swell or crack, often lifting great masses of masonry by their expansion, and after a longer time are found to have fallen completely to powder. The cause of this alarming defect is the presence of free or imperfectly combined lime in the cement, due to too high a proportion of lime in the raw material, or more often to imperfect mixing of the ingredients. The presence of a small percentage of coarse particles of carbonate of lime in the mixture will infallibly produce an unsound cement. This fault is exceedingly liable to occur, since the perfect grinding and mixing of the raw materials are a matter of great difficulty and expense. Free

* From an article by Mr. Spencer R. Newberry in the *Engineering Magazine* (New York).

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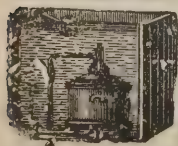
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lime in cements slakes only after long periods, and in slaking expands and causes the hardened cement to crack to pieces. The presence of more than 4 per cent. of magnesia in Portland cement is supposed to produce the same effect. So far as is known, the presence of free lime (or magnesia) in cement is the sole cause of its failure to maintain the strength and hardness at first acquired. As this fault is always the result of expansion, it may be said that cements of constant volume will prove permanent in use.

The usual method of recognising a tendency to expand or crack is the pat test already described. Two such pats should be made and allowed to set; one is then placed in water and the other kept in moist air. The first evidence of bad quality is the loosening of the pat from the glass, which generally takes place, if at all, within one or two days. Bad cement will also show fine radial cracks on the thin edges of the pat, which will also curve up more or less at the edges, presenting a saucer-like shape, and will often become covered with a network of cracks, like alligator-leather. These appearances are usually more marked in the pat kept in moist air. Good cement will remain firmly attached to the glass for two weeks at least, will harden well within two or three days, and will show no cracks, even after a month or more in water. Among the many tests which may be applied to cement, there is none which gives so sure and complete an indication of its quality as this simple pat test on glass; time of setting, hardening qualities, and permanence are thus determined in a single operation.

The hot test for the quick detection of any tendency to expand or crack has come into extensive use within the past few years, and has proved to be of great value. The test consists in exposing a pat of cement, prepared on glass as described above, to the action of steam for about three hours, then allowing it to lie in boiling water for an equal time. The presence of a very small proportion of free lime will cause the pat to swell and crack under this treatment, and sometimes to fall completely to powder, while perfectly sound cements will remain on the glass and harden well, showing no sign of cracking. The Association of German Cement Makers has refused to endorse this test, claiming that it is too severe, and that its use would condemn many cements which prove perfectly sound in practice. There is, however, a very close connection between cracking under the hot test and failure of the cement after long periods, and there can be no doubt that both result from the presence of free lime, chiefly due to imperfect mixture of the materials. It is certain, also, that proper care

in manufacture will produce cement which will stand the hot test perfectly, even very fresh. The use of the hot test is a great safeguard to consumers, as a cement which stands this test well may be relied upon to prove perfectly sound and permanent for all uses in water as well as in air.

After prolonged seasoning or exposure to air, most cements which show a tendency to crack when fresh will be greatly improved and may become perfectly sound, owing to the gradual slaking of the free lime present. It is not well, however, to rely too much on this method of cure, as the final destruction of the work is often only postponed by this process. Such seasoned cement will rarely stand the hot test and becomes more dangerous, owing to the fact that its unsoundness may escape detection by the cold pat tests usually employed.

3. *Strength under Tension and Compression.*—Tensile strength is determined by making up briquets of the cement, both neat and with sand, and pulling them apart on a testing-machine after a certain period in water. In Germany the only test officially recognised is that of cement with three parts of sand, broken at twenty-eight days. In this country neat tests at shorter periods are also generally made. The results of these tests depend to a surprising degree on the conditions under which the briquets are made, and no one can hope to obtain uniform or just results without practice and careful observation of many minute precautions.

The temperature of the room in which the briquets are made and also that of the water used for mixing and that in which the briquets are allowed to lie, should be kept as nearly as possible at 70 deg. Fahr. The effect of this is seen especially in the results at short periods. A sample of cement which shows a strength of 150 lbs. after twenty-four hours, when the briquets are made and allowed to set in a warm room, will generally show less than 50 lbs. if kept in a room near the freezing-point.

The amount of mortar used should be such as to produce a uniformly plastic plaster. Different cements require different amounts of water; for quick-setting natural-rock cement at least 30 per cent. of water is necessary, while with Portland cement from 22 to 25 per cent. will be found sufficient. The use of more water than is necessary to produce a fairly plastic mortar greatly weakens the briquets.

The manner of mixing the mortar greatly affects the results, as the longer the mixture is worked with the trowel up to a certain point, the greater strength the briquets will show. The



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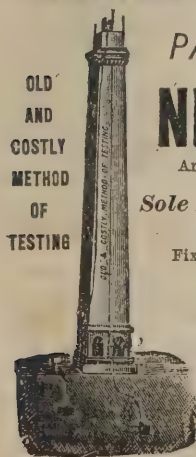
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cement and water should be mixed on a slab of slate or marble, and worked thoroughly with a trowel for at least five minutes. A good plan is to rub enough mixture for each briquet in a large porcelain mortar for a few moments. If this practice is adopted it should be uniformly adhered to.

The moulds should be slightly oiled or soaped on the inside. The mortar is then pressed into them as firmly as possible with the thumbs, rubber thumb-caps being used to protect the hands. The consistency of the mortar should be such that a firm pressure can be used. Pounding the mortar into the moulds will give higher breaks, especially if only 18 to 20 per cent. of water be used, but is not to be recommended, as uniform results cannot be obtained by this method. The surface is smoothed off with the trowel and should appear wet and plastic. The moulds are then turned over, filled and smoothed off on the other side. The briquets are then placed under a damp cloth and left until set before the moulds are removed. With quick setting cement two hours will be sufficient; with Portland cement the moulds should not be removed until the next day. In all cases the briquets should be left for twenty-four hours in air before placing in water.

Sand tests are usually made with one, two or three parts, by weight, of sand. With three parts of sand, water to the amount of 10 per cent. of the total weight of cement and sand will be found to give the best results, and this proportion is specified in the German requirements. The character of the sand used greatly affects the results. In Germany a natural sand from Freienwalde-on-the-Oder, passing a sieve of 20 meshes to the inch and remaining on one of 30 meshes, is recognised as the standard. In the United States crushed quartz of the above fineness is generally used, as recommended by the Society of Civil Engineers. This is made by several manufacturers of sandpaper. Ordinary building sand will generally be found to give rather higher results than the standard sand, as the varying size of the grains leaves less space to be filled with cement. In making sand briquets, thoroughness of mixing is even more essential than in neat tests. The German requirements specify that the mixture of cement, sand and water shall be strongly worked for five minutes. The writer lately tested a cement with three parts sand, and found that, after working the mixture one minute, a tensile strength of 87 lbs. in seven days was obtained, while the same mixture, strongly worked for five minutes, gave a strength of 240 lbs. in the same time.

In making sand briquets a certain amount of pounding is

necessary. The German requirements recommend the use of an iron spatula weighing 250 grammes. Uniform results may generally be obtained by filling the moulds above the top, laying on a piece of wood, and gently pounding with a hammer or mallet. In actual work the proportions of cement and sand are always measured (usually by shovelfuls), not weighed. As cement is 50 per cent. heavier than sand, allowance must be made for this in estimating the value of various mixtures for practical purposes. One part of sand by weight is equal to $1\frac{1}{2}$ parts by measure. Briquets of 1 cement to 3 sand therefore represent the strength which may be obtained in practice from mixtures of 1 cement to $4\frac{1}{2}$ sand by measure.

In judging the results of tests of tensile strength it should be remembered that steadily increasing strength at long periods is better proof of good quality than high results during the first few days. The behaviour of the cement in the pat test and hot test should also be considered in this connection. Cements which are very high in lime, and even those showing a slight tendency to expand and crack, often show astonishingly high breaks at one day and at seven days. This appears to be due to a condition of strain, and is nearly always followed by falling off in strength when tested at twenty-eight days and longer periods.

Natural-rock cement, neat, will generally show 50 to 75 lbs. in seven days, and 100 to 200 lbs. in twenty-eight days. Good Portland cement, neat, will show from 100 to 200 lbs. in one day, 400 to 600 lbs. in seven days, and 600 to 800 lbs. in twenty-eight days. With three parts sand, Portland cement should give at least 100 lbs. in seven days, and 200 lbs. in twenty-eight days. The German requirements specify that cement, with three parts sand, shall show a strength at twenty-eight days of 16 kilogrammes per square centimetre, corresponding to 227 lbs. per square inch.

Compression tests are rarely made in America owing to the rather costly apparatus required. Such tests are, however, of great value in determining the suitability of cement for important work. In general it has been found that the results of compression tests, both neat and with sand, are about ten times as high as tensile tests on the same section. Natural-rock cements give generally relatively lower results in compression tests.

4. *Resistance to Wear, Impermeability, &c.*—The tests for time of setting, constancy of volume and strength under tension and compression are the only ones generally made, since these qualities vary greatly, even in different samples of

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cement of the same make. The other essential qualities of good cement, such as resistance to wear, resistance to frost, impermeability by water, and adhesion to brick or stone, are not liable to great variations, and it may be assumed that any cement which stands the usual tests will give satisfactory results in all other respects.

Tests of the comparative power of different cements and mixtures of cement with sand to resist wear have been made by Professor Böhme, head of the royal testing-station for building materials in Berlin. His apparatus consists of a rotating cast-iron table sprinkled with emery powder, upon which cubes of cement are ground for a given time under constant pressure. Neat cement is found to be greatly inferior in wearing qualities to mixtures of cement with sand, being, in fact, about equal to a mixture of 1 to 3½ parts. The best wearing qualities are shown by a mixture of 1 part cement to 1 part sand (by weight); practically equal results are obtained with a mixture of 1:2. These facts have an important bearing on the use of cement for sidewalks and flooring. The greatest fault met with in sidewalk work is the occurrence of long irregular cracks across the blocks. This fault is usually attributed to the poor quality of the cement or to frost, but it is solely due to slight shrinkage of the cement in hardening, and occurs with the best and hardest cements when the proportion of sand employed is too small.

As for resistance to frost, little or no hardening takes place at temperatures below freezing, and partially hardened cement, saturated with water, is liable to suffer much in strength by being frozen. After thawing, however, the hardening proceeds again, and in most cases no serious results from freezing are apparent. The addition of salt to the mortar, often practised, is harmless, and in some cases may be of value. The chief point to be observed in using cement in winter is the sparing addition of water; in fact, an excess of water is in all cases injurious, as the strength of the work is greatly weakened by it. Probably in nine cases out of ten masons add far more water than they should, from either carelessness or a desire to avoid the greater labour of working less fluid mortar. The best results are always obtained by making a mixture of cement and sand not wetter than moist garden earth. No water should be visible until the mixture is well trowelled or pounded. If this precaution be observed, cement work may be carried on in the coldest weather without bad results.

5. *Impermeability.*—Cement is extensively used as a water-proof material, especially in lining cisterns, aqueducts and

reservoirs. The impermeability of cement mortar increases greatly with age, so that comparatively porous mixtures will become quite dense in time. For linings which are to be immediately waterproof not more than one part of sand (by weight) to one of cement can safely be used. A mixture of one cement to two sand will, however, prove impermeable after the lapse of a few weeks. The addition of slaked lime to the mortar greatly increases its density, and also increases the strength of mixtures poor in cement. In concrete work a mixture of one part of lime, previously well slaked, one part Portland cement and six parts sand will be found to give as good results as two parts cement to six of sand, the lime thus replacing half the cement without causing loss of strength. Used in this manner Portland cement will be found much cheaper than the natural-rock cements for ordinary uses. For waterproof linings a mixture of one part cement, one-half part slaked lime, and three parts sand, or even one cement, one slaked lime and six sand will be found sufficiently impermeable. It has also been found that the addition of slaked lime to cement-mortar greatly increases its adhesion to brick or stone. Masons often object to using mixtures of cement with three or more parts sand as mortar for brickwork and masonry, on account of its working "short" under the trowel. Increasing the proportion of cement is extravagant and unnecessary. The objection can be overcome by adding one part of slaked lime, which will make the mortar "fat," plastic and easy to work.

COUNTY COUNCIL EXTRAVAGANCE.

THE *Local Government Journal* calls attention to the fact that the original estimate for the Parker Street Lodging House, built by the London County Council, was 11,000*l.*, while the actual cost, as admitted by the Chairman of the housing committee on Tuesday, was 21,000*l.* The fire station at New Cross Gate, which was publicly opened on Saturday, is another specimen of extravagance. The contractor's price was 14,700*l.*, or 1,600*l.* below the architect's estimate. This was not accepted, and the Council, in order to give the works committee an opportunity to justify its existence, gave the job to them, with the result that they have spent 20,000*l.* on work which a contractor offered to do for 5,300*l.* less. More than this, during the last twelve months about 400 accounts for works have been submitted by this committee at the various fire stations, and in every case they were above the architect's estimate, some of

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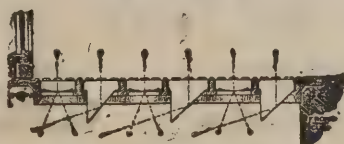
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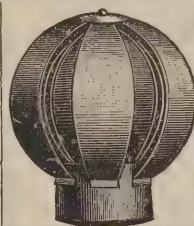
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them 50. and even 100 per cent. above. This is the price Londoners are asked to pay for the latest Progressive dodge to catch the labour vote. It is to be hoped that every ratepayer will remember these indisputable facts at the election in March next.

REGISTRATION OF PLUMBERS.

THE Plumbers' Company have lately addressed a circular to architects alluding to the advantages of the proper training and the registration of plumbers, with a view of asking the support of architects in favour of the movement. It will, no doubt, be favourably received.

LIST OF REGISTERED PLUMBERS.

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ARMITAGE, T. A., Buxton Road, Huddersfield.
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GAWNE, A. E., High Street, Port St. Mary, Isle of Man.
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KASSALL, T. H., Church Street, Hornby, near Lancaster.
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LYON, W., 6 Rice Lane, Walton-on-the-Hill, Liverpool.
MCDONNELL, A. M., 84 Main Street, Bray, co. Wicklow.
MIDDLETON, J. W. R., 16 Thomas Street, Runcorn.
MOONEY, H., 110 Upper Stanhope Street, Liverpool.
RIGBY, W. H., 47 Rigby Terrace, Heath Street, Golborne, near Newton-le-Willows.
STONEHOUSE, J. H., 3 Herbert Grove, Leeds.
SULLIVAN, W., 23 Magdalen Street, Drogheda.
THOMPSON, S. S., 5 Parliament Street, Halifax.
WILDIG, H., care of Mr. J. Mayers, Christleton, Chester.
WILL, A. R., 20 Powis Place, Aberdeen.
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PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10806. John Rothwell, for "Improvements in automatic or self-acting ventilators."
10811. Thomas Jenks and Thomas Hook, for "An improvement in fittings for the fixing and hanging of casement windows."
10844. William Phillips Thompson, for "An improved hinge device for doors, windows, box-lids and the like."
10857. Peter Knobel, for "Improvements in door-springs."
10908. Guillermo Antonio Farini, for "Improvements in watering cans."
10966. James Lawrie, for "Improvements in and connected with window-sashes."
10974. Archibald William McMurdo, for "An improved door-sneek or catch."
10976. Cornelius Horton, for "Improvements in blinds."
11014. George Murphy, for "Improvements in sash-fasteners."

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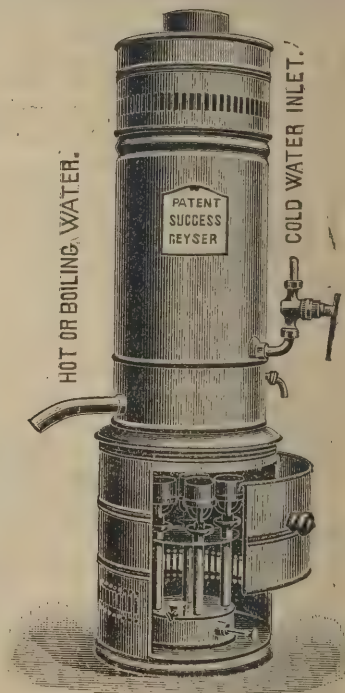
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERDARE.—July 2.—For Alterations &c. to Duffryn Joint Schools. Mr. T. Roderick, Architect, Aberdare.

ABERDARE.—July 12.—For Extension of Board Schools. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

BARNESLEY.—July 3.—For Building Wing, Kendray Hospital. Mr. J. Henry Taylor, Borough Surveyor.

BAXENDEN.—July 2.—For Building Conservative Club. Mr. Henry Ross, Architect, Birch Street, Accrington.

BETHNAL GREEN.—July 5.—For Supply and Delivery of 100 Gully Gratings. Mr. F. W. Barratt, Vestry Hall, Church Row, Bethnal Green.

BILSTON.—July 2.—For the Construction of a Covered Service Reservoir at Goldshorn Hill. Mr. Baldwin Latham, Inst.C.E., 13 Victoria Street, S.W.

BLAIRGOWRIE.—For Additions to Mansion. Mr. Thos. Leadbetter, Architect, 17 Young Street, Edinburgh.

BLYTH.—July 3.—For Rebuilding Thoroton Hotel. Mr. Edwin Bowman, Architect, 62 Grainger Street, Newcastle-on-Tyne.

BOURNEMOUTH.—July 9.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

BOWLING.—June 30.—For Weaving Shed, Warehouse, Engine-house, Boiler-house, Chimney, Reservoir, &c. Mr. Sam Spencer, Architect, 344 Great Horton Road, Great Horton.

BRADFORD.—July 4.—For Enlargement of Church, Tong Street. Messrs. T. H. & F. Healey, Architects, 42 Tyriel Street, Bradford.

BRISTOL.—July 4.—For Additions to National Schools. Messrs. Foster & Wood, 36 Park Street, Bristol.

BROMLEY.—July 10.—For Kerbing, Channelling, Granite Paved Crossings and Relaying Existing Granite Paved Crossings. Mr. Frederic H. Norman, Local Board Offices, Bromley, Kent.

BURLEY.—July 12.—For Building Isolation Hospital, &c. Mr. A. Hill Parker, Architect, 5 Foregate Street, Worcester.

BURTON-ON-TRENT.—For Restoration of Parish Church. Mr. J. A. Chatwin, Architect, 20 Temple Street, Birmingham.

BURY.—July 2.—For Erection of Buildings in connection with Electric Lighting Station. Mr. J. Cartwright, M.I.C.E., Corporation Offices, Bury.

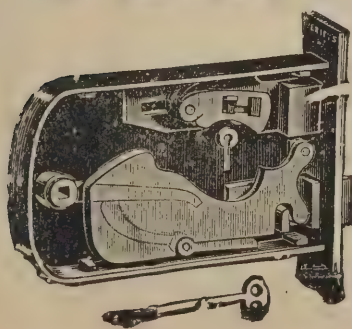
CARDIFF.—July 14.—For Extension of Board School, Grangetown. Mr. E. M. B. Vaughan, Architect, Borough Chambers, Wharton Street, Cardiff.

CARLTON.—July 10.—For Construction of Brick Culvert Boundary Walling and Storage Shedding. Mr. R. Whitbread, Surveyor, Burton Road, Carlton, Notts.

CLECKHEATON.—July 9.—For Building Four Scullery Houses. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

CROYDON.—July 2.—For the Erection of a New Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

DERBY.—July 9.—For Additions to Municipal Technical College. Messrs. Waller & Son, Architects, 17 College Green, Gloucester.



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DUNFERMLINE.—June 30.—For Alterations to U.P. Church and New Halls. Mr. Robertson, School-house, Halbeath, Dunfermline.

EDINBURGH.—July 3.—For Building Public School, Broughton. Mr. Robert Wilson, Architect, 3 Queen Street, Edinburgh.

ELSWICK CEMETERY.—June 30.—For Works to Buildings. Mr. George Thompson, 1 Newgate Street, Newcastle-on-Tyne.

FLEETWOOD.—June 30.—For Reseating Portion of Parish Church. Mr. W. Gornall, Albert Square, Blackpool.

FROME.—July 3.—For the Supply of about 49 tons of Cast-iron Socket and Spigot Pipes. Mr. Allan Greenwell, A.M.I.C.E., Surveyor's Office, Fromefield, Frome.

FULHAM.—July 9.—For the Erection of a Postal Sorting-office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

GILFACH FARGOED.—July 6.—For Building Hotel. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

GLASGOW.—July 6.—For Excavator and Concrete Work on Site of New Sanitary Chambers. Mr. J. Lang, City Chambers, Glasgow.

GLOUCESTER.—July 2.—For Altering Existing Offices. Erection of Council Chamber and other Works at Shire Hall, Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GOLDSPIE.—June 30.—For Construction of Pier. Mr. James Barron, Engineer, 166 Union Street, Aberdeen.

GOWERTON.—June 29.—For Building Intermediate School. Mr. T. P. Martin, Architect, Heathfield Street, Swansea.

HALSTEAD.—July 7.—For Addition to Grammar School of Dining-room and Dormitory. Mr. C. F. Hayward, 47 Museum Street, W.C.

HEADINGLEY.—July 7.—For Building Pair of Semi-detached Villas. Messrs. Walker & Collinson, Architects, 13 Piece Hall Yard, Bradford.

HOLLOWAY.—July 3.—For Coal-shed for Infirmary. Mr. H. O'Hill, Guardians' Offices (Holborn Union), Clerkenwell Road.

HOLMESFIELD.—July 2.—For Building Mixed School. Mr. Walter J. Sykes, Architect, Hoyland, near Barnsley.

HORNSEY.—July 2.—For Construction of Overground Public Conveniences. Mr. T. de Courcy Meade, Engineer, Southwood Lane, Highgate, N.

HORNSEY.—July 2.—For Construction of Sewer and other Works at Crouch End, and the Making-up of Carriage-ways, Channelling, Kerbing and Paving of Footways in Tottenham Lane and Middle Lane, Hornsey. Mr. T. De Courcy Meade, C.E., Local Board Offices, Southwood Lane, Highgate, N.

HORNSEY.—July 12.—For Supply and Erection of Unclimbable Wrought-iron Fencing. Mr. T. De Courcy Meade, C.E., Local Board Offices, Southwood Lane, Highgate, N.

INDIA.—July 24.—For Construction of Settling Tanks, Filter Beds, Elevated Reservoirs, Supplying and Laying Pipes, &c.; Supplying Pumping Engines. This Tender must be accompanied by Drawings and Specifications of the Engines and Pumps, and the makers' names must be given. There will be no objection to the name of more than one maker being mentioned. At Howrah, in the Bengal Presidency. Messrs. Grindlay & Co., 55 Parliament Street, S.W.

KEIGHLEY.—July 2.—For Extension of Victoria Hotel. Messrs. W. H. & A. Sugden, Architects, Low Street, Keighley.

KENSINGTON.—July 10.—For Taking-up present Wood Paving, Floating with Fine Concrete the Existing Concrete Foundations, and Providing and Laying Blocks of Creosoted Yellow Deal. Mr. William Weaver, Town Hall, Kensington.

KINSON.—July 7.—For Building Police Station and Justice Room. Mr. Walter J. Fletcher, County Architect, Wimborne.

LEAMINGTON.—July 6.—For Building Board School for Boys, Cookery School, and Manual Training School, &c. Mr. Frederic Forster, Architect, 4 Euston Place, Leamington.

LEWISHAM.—July 3.—For Kerbing, Tar-paving, Metalling and Channelling Work. Mr. Edward Wright, Board of Works Offices, Catford, S.E.

LEYTON.—July 3.—For Draining, Making-up and Kerbing Streets. Mr. William Dawson, A.M.I.C.E., Local Board Offices, Town Hall, Leyton.

LEYTON.—July 3.—For Supplying and Laying about 1,690 Yards of Norway Granite Kerb, and for Forming Footways, Gullies, &c. Mr. William Dawson, A.M.I.C.E., Town Hall, Leyton.

LLANGATTOCK.—June 29.—For Additions to Board School. Mr. W. Haines, The Bryn, near Abergavenny.

LONDON.—July 3.—For Supply and Delivery of 22,000 Tons of Lime. Mr. H. De La Hooke, County Hall, Spring Gardens, S.W.

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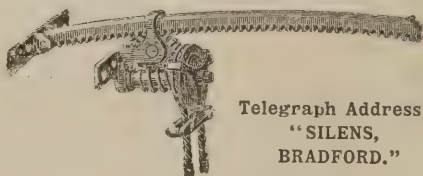
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LYMM.—July 3.—For Building Two Houses. Messrs. Jones & Jackson, Limefield, Bury, Lancashire.

MILDENHALL, SUFFOLK.—July 11.—For the Erection of Workhouse and Infirmary. Mr. Frank Whitmore, Chelmsford.

MYTHOLMROYD.—July 5.—For Building Church School and Institute. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

NEWCASTLE-ON-TYNE.—July 4.—For Additions to Middlestone Moor Board School. Mr. J. W. Taylor, Architect, 31 Westgate Road, Newcastle-on-Tyne.

NEWPORT.—July 2.—For Construction of Storage and Intake Reservoirs, Tunnels, &c. Mr. Conyers Kirby, Engineer, Stow Chambers, Newport, Mon.

NEW ROSS.—July 12.—For Building National School. Mr. Walter G. Doolin, M.A., Architect, 20 Ely Place, Dublin.

NORTHAMPTON.—July 2.—For Additions to Workhouse Vagrant Wards. Mr. J. Piccaver, Architect, 7 Wood Hill, Northampton.

PEMBROKE.—July 2.—For Additions to Welston Court. Mr. Wm. Thomas, Borough Surveyor, Barton Place, Pembroke.

PLAISTOW.—July 3.—For Block of School Buildings. Messrs. T. J. Newman & Jacques, Architects, 2 Fen Court, E.C.

RUNCORN.—July 6.—For Building Stables. The Secretary, Co-operative Society, 8 Church Street, Runcorn.

SOUTHEND.—July 4.—For Levelling, Paving, Channelling, Metalling and Making Good Tyler's Avenue. Mr. C. T. Copley, Borough Surveyor, Clarence Road, Southend.

STAINLAND.—July 4.—For Building Four Houses, Jagger Green. Messrs. C. F. L. Horsfall & Son, Architects, Halifax.

SUTTON.—July 2.—For Internal Cleansing, Distempering, Colouring, Painting, &c., of Dormitories and Day-rooms, at Brighton Road Schools. Mr. Martin, Superintendent.

TEWKESBURY.—July 2.—For Additions to Workhouse. Mr. H. A. Badham, Clerk.

TOXTETH PARK.—July 2.—For Building Fire Station. Mr. John Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park.

UPPER HOLLOWAY.—July 3.—For the Erection of a Coal Shed at Holborn Union Infirmary. Mr. Harry O'Hill, Guardians' Offices, Clerkenwell Road, E.C.

WALTHAMSTOW.—June 29.—For the Erection of a Fire Engine Station. Mr. Geo. W. Holmes, M.I.C.E., Town Hall, Walthamstow.

WEST HAM.—July 10.—For Electric Lighting, the Supply of Furniture, and the Supply of 1,000 Chairs to Public Hall, Canning Town. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

WESTMINSTER.—July 4.—For Laying and Maintaining Asphalt Paving. Mr. G. R. W. Wheeler, Vestry Hall, Westminster.

WILLESDEN.—July 10.—For Providing and Laying 14,516 Yards of Wood Paving. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn, N.W.

WILLIAMSTOWN, CO. GALWAY.—July 3.—For Building Residence, &c., for Dispensary Doctor. Mr. C. Mulvany, C.E., Castlereagh.

WOODFORD.—July 2.—For Erection of Pathological Buildings at the Claybury Asylum. Mr. G. T. Hine, 35 Parliament Street, S.W.

THE city authorities of Newcastle-on-Tyne have given instructions to Messrs. W. Potts & Sons, of Leeds and Newcastle, to take down the present clock from St. Nicholas' Cathedral and place the same in the tower of All Saints' Church in that city, and to make a larger and more powerful clock and chimes for the cathedral suitable for the large new bell recently erected in the tower; also to have the large bell used to denote the time of day, by circuit wire from Greenwich Observatory at one o'clock daily instead of the signal-gun, which was discontinued some time ago. The above clock when completed will be the largest in the kingdom, Messrs. Potts having already put the work in hand. They have also the large clock with four 11 feet 6 inches illuminated dials in hand for the New City Hall, Sheffield, and a large clock with two 6 feet illuminated dials and bell for Messrs. Reckitt, Sons & Co., Limited, Hull.

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W. Baird, Dublin	£2,561	0	0
J. Cunningham, Dublin	1,984	14	0
G. J. DIXON, Dublin (accepted)	1,718	14	3

ABERAVON.

For Building Infant School at Sandfields, Aberavon (to accommodate about 180 Children), for the Aberavon, Port Talbot, School Board. Messrs. THOMAS & JAMES, Architects, Plough Terrace, Port Talbot.

M. Cox	£1,450	0	0
J. & S. Rees	1,415	0	0
J. Davies	1,385	0	0
C. & F. GAIN (accepted)	1,380	0	0

BATLEY.

For Building Five Houses, Dark Lane, Batley. Mr. WALTER CRAWSHAW, Architect, Market Place, Batley.

Accepted Tenders.

S. S. Baines & Sons, contractor	£498	9	6
J. Clarkson, joiner	200	0	0
G. Fawcett, Dewsbury, slater	40	6	0
Kitchingman & Kaye, Heckmondwike, plasterer	39	0	0
Exley Bros., plumber	38	0	0

BEAUFORT.

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W. Davies, Beaufort	£189	0	0
Edwards, Tredegar	145	0	0
D. VAUGHAN, Tredegar (accepted)	144	10	0

BECKWITHSHAW.

For New Farm Buildings at Shaw Green, Beckwithshaw. Messrs. FAIRBANK & WALL, Architects, 3 Manor Square, Otley.

Accepted Tenders.

J. & W. Dickinson, Timble Great, mason	£386	3	0
G. Towers, Beckwithshaw, joiner	310	0	0
J. Largcock, Otley, plasterer	76	10	0
J. Suttle & Son, Otley, plumber	68	19	0

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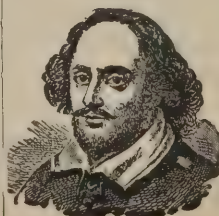
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Architect's estimate	3,780 5 0

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J. Atkinson	1,169 18 0
W. G. Hey	1,158 18 8
F. Greenwood & Son	1,129 0 0
J. Halliday	1,110 9 6
J. Hanson*	1,090 0 0
Architect's estimate	1,156 0 0

Slater and Plasterer Work.

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Architect's estimate	668 0 0

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J. Bagshaw & Son	677	0	0
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J. Hitchen	657	6	0
J. Berry, including Dorman, Long & Co.'s steel extra *	649	12	1
Architect's estimate	662	14	6

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Architect's estimate	378	17	0

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G. Walker	504	10	5
T. Boocock	488	10	6
J. Naylor & Son	480	0	0
O. Kitchen	476	0	0
W. Nettleship	475	0	0
W. Ward*	472	11	6
Architect's estimate	536	8	5

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C. Thompson	89	14	7
T. Carr	76	0	3
Stringer	74	15	9
J. Viney*	67	11	5
W. Hutchinson, Illingworth	66	10	0
Architect's estimate	86	13	0

* Accepted subject to the confirmation of the Council.

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J. Jackson, Plaistow	1,400	0	0
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H. Wells & Sons, Buckhurst Hill	1,115	0	0
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Clay & Co.	739	0	0
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J. & W. Beckett, Barrow Street, Dublin	780	0	0
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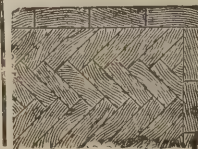
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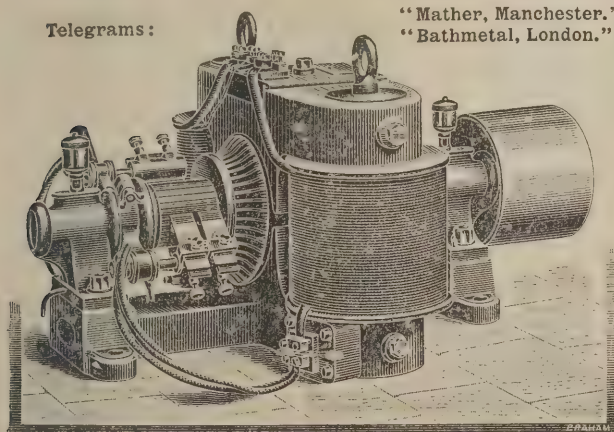
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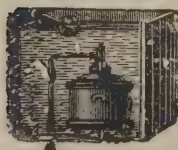
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J. Smith & Sons	10,398 0 0
Kirk & Randall	10,121 0 0

For Building Board School, Maryon Park, Charlton, Greenwich, for 800 children, with Cookery and Laundry Centres on the Site. Mr. T. J. BAILEY, Architect.

	A
T. L. Green	£21,385 0 0
T. Boyce	21,328 0 0
J. Marsland	20,966 0 0
Lathey Bros.	20,931 0 0
H. Lovatt	20,856 0 0
E. Lawrance & Son	20,623 0 0
Stimpson & Co.	19,940 0 0
B. E. Nightingale	19,917 0 0
Kirk & Randall	19,244 0 0

A. Extra if Brickwork in Cement.



BEST PORTLAND CEMENT.

"ADAMANT BRAND." Manufactured by

SKELSEY'S ADAMANT CEMENT Co. LD.,

HEAD OFFICES: 121 HIGH STREET, HULL. WORKS: STONEFERRY, HULL, & BARTON-ON-HUMBER.

Output 700 tons weekly.

Telephone No. 16.

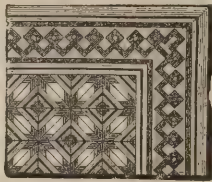
Telegraphic Address, "Adamant, Hull."

OFFICES—
22 QUEEN'S RD.,
Bayswater,
London
TURPIN'S
Parquet Floor,
Joinery and
Wood Carving
Co., Ltd.

PARQUET FLOORINGS,

One inch and 1/2-inch thick.

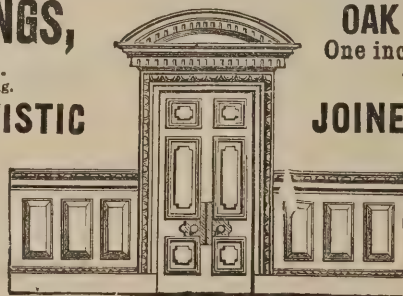
Immense Stock always ready for Laying.



Turpin's Patent.

5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

ARTISTIC



WOOD CARVING.

MARBLE

MOSAIC

PAVING.

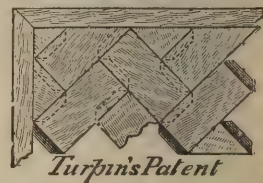


1/2-inch Parquet
Wood Backings

OAK BLOCK FLOORINGS

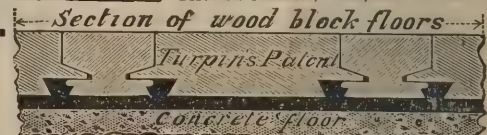
One inch thick, 4s. 10d. per yard, super.

Also in Pitch Pine, Teak, Deal, &c.



Turpin's Patent

System of Preparing for Laying Inch Block Floor on Concrete, Stone, and Deal Floors.



Section of wood block floors

Turpin's Patent

Concrete floor

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WESTMINSTER

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PROVIDENCE WORKS
MILLWALL

PUBLIC
BUILDINGS
THEATRES, ETC.

LONDON—continued.

For Building Board School on the site in Hungerford Road, Islington, to provide accommodation for 1,174 children, with Laundry and Manual Training Centres. Mr. T. J. BAILEY, Architect.

			A
Foster & Dicksee	£22,155	0 0	£370 0 0
T. L. Green	20,792	0 0	525 0 0
Kilby & Gayford	20,559	0 0	476 0 0
S. & W. Pattinson	20,450	0 0	423 0 0
W. Goodman	20,332	0 0	397 0 0
H. Lovatt	20,130	0 0	423 0 0
E. Lawrance & Sons	19,965	0 0	475 0 0
J. Grover & Son	19,888	0 0	440 0 0
C. Cox	19,505	0 0	475 0 0

A. Extra if Brickwork in Cement.

MENSTON.

For Three Terrace Houses and Shop Premises at Menston. Mr. W. H. SHARP, Architect, 237 Rooley Lane, Bradford.

Revised Tenders.

M. Cowling, mason	£1,930	0 0
Scott Bros., joiners	610	0 0
J. Lockwood, Guiseley, plumber	162	0 0
J. F. Walsh, Cassfield, plasterer	124	0 0
J. Smithies, Bradford, slater	117	10 0
T. Mann, Burley-in-Wharfedale, painter	39	10 0

MID-CALDER.

For Building Boundary Walls of New Burying Ground, and Works in connection with Erection of Sexton's House, for the Mid-Calder Parochial Board. Mr. JAMES W. HISLOP, Architect, Kirkcaldy.

Accepted Tenders.

G. Paterson, West Lothian, builder	£456	4 6
W. Brown, joiner	98	18 6
J. T. Barclay, plumber & ironwork	73	0 2
J. Douglas, slater & plasterer	27	1 11

NEATH.

For Extension to Bible Christian Chapel, Skewen, Neath.

W. Rowland	£377	0 0
I. Michael	369	15 0
H. David	290	0 0

NEWCASTLE-ON-TYNE.

For Building Elswick Road Board School.

W. Scott, Newcastle . . . £12,952 4 6

Terra-cotta.

J. C. Edwards, Ruabon . . . 555 17 0

Heating and Ventilating Apparatus.

Emley & Sons . . . 530 0 0

NEW TREDEGAR.

For Additions and Alterations to the Workmen's Hall, New Tredegar. Messrs. AARON DAVIES & SON, Architects, Pontllytyn.

Freeman and Hardy . . . £293 0 0

Williams and Sons . . . 270 0 0

PLYMOUTH.

For Alterations to Sailors' Home, Vauxhall Street, Plymouth. Mr. JOHN H. DWELLEY, Architect, 5 Sussex Street, Plymouth. Quantities by the Architect.

Foot . . . £699 10 0

Palmer . . . 650 0 0

Lethbridge . . . 649 0 0

Turpin . . . 634 0 0

Julian, Truro . . . 628 0 0

Goad . . . 608 0 0

Perraton . . . 560 0 0

Paynter & Davy . . . 549 0 0

PEARNS & SONS (accepted) . . . 525 0 0

For Reconstruction of Sewer in Skardon Place. Mr. JAMES PATON, Borough Engineer.

J. Parson & Sons . . . £171 10 2

Wakeham Bros. . . 162 10 3

J. Shaddock . . . 157 8 6

T. Shaddock . . . 150 5 9

E. Duke . . . 144 18 9

PAYNTER & DAVY (accepted) . . . 140 17 0

PORTSMOUTH.

For Building Workshops at the Union Schools, for the Guardians of Portsea Island Union. Messrs. RAKE & COGSWELL, Architects, Prudential Buildings, Portsmouth.

T. P. Hall . . . £1,020 0 0

J. Crockerell . . . 975 0 0

H. Jones . . . 970 0 0

Sprigins Bros. . . 960 0 0

W. Learmouth . . . 954 0 0

W. Evans . . . 848 0 0

A. E. PORTER (accepted) . . . 840 0 0

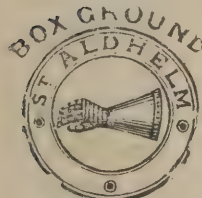
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R. J. MARSH & CO., Ltd., S. R. NOBLE, STONE BROS., Ltd.



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WATERPROOFING,
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PRESERVING
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ALBERT WORKS, ALBERT EMBANKMENT LONDON, S.E.

RAINHILL.

For Building Nurses' Home at the County Lunatic Asylum, Rainhill, for the Visiting Committee. Messrs. GRAYSON & OULD, 31 James Street, Liverpool, Architects.

Sayce & Randle, Widnes	£7,193	7	4
E. Aukland, Warrington	6,348	0	0
J. F. Hill, Woolton	6,105	0	0
Beckett & Co., Hartford, Northwich	5,790	0	0
R. Neill & Sons, Manchester	5,743	0	0
Holme & Green	5,695	0	q
S. Webster, Bootle	5,680	0	0
Jones & Sons	5,600	0	0
G. Woods & Son, Bootle	5,524	0	0
Brown & Backhouse	5,477	10	0
R. H. Davies, St. Helens	5,250	0	0
G. L. Desser	5,219	0	0
J. Paterson & Son	5,138	0	0
T. Spencer, Aintree	5,112	0	0
J. Pilkington, Rainford	4,942	0	0
J. ROTHWELL & SONS, St. Helens (accepted)	4,846	0	0

SWINDON.

For Erection of Infant School at Stratton St. Margaret, near Swindon, Wilts, for the Stratton St. Margaret School Board. Mr. WILLIAM DREW, M.S.A., Architect to the Board, 22 Victoria Street, Swindon. Quantities by the Architect.

W. Chambers, Swindon	£1,800	10	0
Wall & Hook, Brimscombe	1,673	0	0
T. Barrett, Swindon	1,638	0	0
H. Looker, Stratton	1,620	0	0
C. Williams, Swindon	1,607	0	0
T. Colborne, Swindon	1,569	10	0
G. Wiltshire, Swindon	1,550	0	0
H. Flewelling, * Wootton Bassett	1,491	0	0

* Accepted subject to the approval of the Education Department.

For Rebuilding the Cold Harbour public-house, Blunsdon St. Leonard, near Swindon, Wilts, for Messrs. Wadley & Holloway. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

CHARLES WILLIAMS, New Swindon (accepted).

ST. ANNE'S-ON-SEA.

For Building Offices, for the Local Board.

S. Wilson	£2,084	5	0
W. Cookson	1,920	0	0
W. Woodcock	1,900	0	0
J. SHEPHERD & SONS (accepted)	1,893	0	0

For Construction of 170 Yards of 12-inch Earthenware Sewers, for the Local Board.

T. Riley, Fairhaven	£233	15	0
W. Tidswell, Fairhaven	212	10	0
J. Fish & Co., 57 Powis Road, Ashton-on-Ribble	127	10	0
R. GREAVES (accepted)	108	7	6

BUILDING AND BUILDERS.

THE cost of the proposed new infirmary for Paisley is estimated at 32,000*l.*, exclusive of cost of site, furnishing, and fees. A sum of 15,000*l.* is required to supplement the bequest of the late Mr. W. B. Barbour and donations of other friends.

At the sitting of the Edinburgh Dean of Guild Court warrants were granted to Mr. William Gerard to build a villa at North Park Terrace, and to Pape's Trustees to build three almshouses at Coltbridge. Professor Patrick Geddes was given leave to remove the stable and existing buildings at the corner of Watergate and the North Back Canongate, and erect a tenement of shops and artisans' dwelling-houses of two rooms each. The building is to have five storeys looking towards Watergate, and four storeys towards the North Back Canongate.

In the Partick Dean of Guild Court, Messrs. J. & W. R. Thomlinson were granted lining to erect two tenements of dwelling-houses in Dumbarton Road, immediately to the west of the railway bridge. The estimated cost is 8,000*l.* Mr. Peter M'Kissock, Glasgow, also received permission to erect two villas, to cost 3,000*l.*

THE death is announced of an old and well-known builder in Shropshire, Mr. John Vaughan, of Sandford, West Felton.

At a meeting of the Anglesey joint police committee at Llangefni, Mr. O. Morris Roberts, architect, submitted amended and modified plans of the county buildings proposed to be erected, which could be carried out at a cost not exceeding 5,500*l.* or 5,600*l.* as estimated. It was decided that application be made to those builders who had previously tendered for tenders on the amended plans.

The Cheapest Substantial Relief Decoration Extant

Suitable for all Decorative Purposes

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Wall Decoration

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ILLUSTRATIONS.

TUDOR CHAMBERS, 54 AND 55 CORNHILL.

GARDEN FRONT.—ENDALLS MANOR.

SELECTED DESIGN FOR NEW MEAT MARKET AND SLAUGHTER-HOUSES FOR THE CITY OF BIRMINGHAM.

TRADE NOTES.

TWO west windows have been inserted at St. Stephen's Church, Willenhall, containing figures of St. Peter and St. Paul, from the studio of Mr. T. W. Camm, Smethwick.

THE parish church clock of Woodstock has just been thoroughly restored by Messrs. John Smith & Sons, Midland Clock Works, Derby. Four new dials, with hour and minute hands, have been fitted in place of the old dials, which had hour hands only. The same firm made the clock at Bladon Church, which is also quite close to Blenheim House.

THE new Cottage Hospital, Dartford, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

AT the meeting of the Bath Town Council a report was presented from the special committee as to the sewage disposal. They reported that they had entered into provisional contracts with the owners of a site which might be suitable for a chemical precipitation. They advised that the question referred to them by the Council, as to the levels of the new intercepting sewers, should be referred to the expert as part of the whole matter referred to him. They recommended the Council to engage the services of Mr. W. H. Radford, C.E., of Nottingham. It is expected that the sewage of Bath will have to be collected by means of intercepting sewers, and conveyed to one outfall for purification. The scheme has been estimated to cost between 70,000*l.* and 80,000*l.* The population of the city is about 52,000.

IN last week's *Architect* an illustration of the School Board Offices at Reading appeared. We are pleased to state that Milner's Safe Company, Limited, supplied the iron doors for the strong-rooms, as they also did for the Mansion Ballard Coomb.

WE understand that Messrs. Winfields, Limited, of Birmingham, in consequence of the expiration at Midsummer of the lease of their present premises in Farringdon Street, London, are removing their London sample room to No. 30 Snow Hill, E.C., being directly opposite the present premises. The London business will continue to be under the direction of Mr. Seymour Croneen, and arrangements are being made for the display in the new show room, of an entirely fresh selection of samples, including the latest designs in gas and electric light fittings, bedsteads and cots, and general brassfoundry.

WE hear that Messrs. Charles Erith & Co, heating, ventilating and drying engineers, have, owing to the rapid development of their business, both in this country and abroad, removed their head offices from 13 Little Trinity Lane to more central and convenient premises at No. 70 Gracechurch Street, E.C. (close to Fenchurch Street), where all future communications should be addressed. They will continue to hold a large stock of their well-known hot-blast apparatus and other specialities at their London and provincial warehouses, ready for prompt delivery.

AMONG the exhibits at the Show of the Royal Agricultural Society, held this year in Cambridge, is one by Mr. Henry Hope, of Lionel Street, Birmingham. Included in his exhibit is a span-roofed vinery, 30 feet long by 15 feet wide, to be built on wall 2 feet 6 inches high above floor line, with two glass ends, one fitted with door. It is constructed of the best well-seasoned red deal, the roof being braced with strong cast-iron spandrels and wrought-iron cross bars. Cast-iron gutters are fixed on the eaves, with down pipes to the ground level. Ventilating lights are hung the whole length of each side and along one slope of the roof, and each set is worked simultaneously by shafting and screw gear fixed at one end of the house. All the lights and the door are hung on strong brass hinges, the door being fitted with brass mortice lock and furniture. The interior of the house is fitted with strong wire trellis of the most approved form for training vines to.

THE proprietor of the Westgate New Arcade, Bradford, Mr. Hy. Lingard, has placed a new illuminated turret-clock in the front of his extensive premises with all Lord Grimthorpe's latest improvements inserted, the work having been executed by Messrs. W. Potts & Sons, clock manufacturers of Leeds and Newcastle-on-Tyne.

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Court Road, HOUSE FURNISHERS & DECORATORS.

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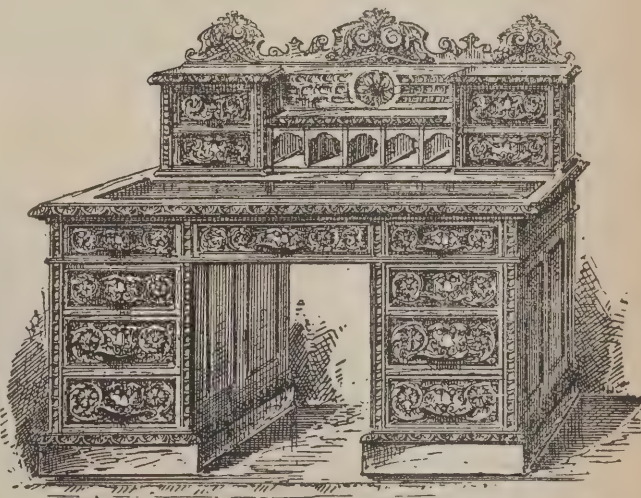
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HEWETSONS, TOTTENHAM COURT RD., LONDON, W.

Extract from THE GENTLEWOMAN (Mrs. PANTON)—"You can find all the furniture at Hewetsons', or if you are dubious of your own powers, you could either send me the pretty catalogue to mark, or my daughter could choose them next time she is in town, if you liked. The catalogue should certainly be seen; it is entirely a work of art, and most useful to country residents."



440.—English Carved Oak Writing Table, Leather Top, on Casters. £15 10s.

Without Drawer and Pigeon-holes on Top, £10 10s.

VARIETIES.

MESSRS. FREDERICK WALTON & Co., Limited, of Newman Street, W., who have brought out various applications of their Lincrusta Walton, which rival one another in beauty and utility, have just added a new ceiling design, "The Conqueror," to their collection. It forms a geometrical pattern which, from its lightness and simplicity, is specially adapted for a horizontal application. This ceiling covering is remarkably cheap, for it can be obtained at the sum of a shilling a yard, a price which will enable it to be used in the cheapest houses. The ceiling decoration can be obtained in ivory-white and special buff, but other tints can be employed if desired.

A MEETING of the Building Trades' Federation was held in Hyde Park on Sunday last. The following resolution was unanimously adopted at each of the five platforms:—"That this mass meeting of building trade workers considers the time has arrived for the return of members of the building trades on all local and municipal bodies within the London district to press forward the enforcement of the provisions of the agreement of June 1892 by the insertion of the trade union clauses in all contracts; and, further, we pledge ourselves to use every legitimate means at our disposal for the direct employment of labour, under trade union conditions, by all local and municipal bodies."

THE London, Brighton and South Coast Railway Bill, authorising the company to make a new line from Coulsdon, near Reigate, to South Croydon, to avoid slow trains impeding the fast ones, has passed through Committee in the House of Lords. New capital powers of 480,000*l.* are authorised.

THE King of the Belgians paid a special visit to the Antwerp Exhibition last week to inspect the very elaborate glass exhibits on view there. The fine display of extra quality window glass shown by the Red Star Glass Works Company attracted his special attention, and the manager of this well-known company had the honour of being presented to his Majesty, who graciously evinced his interest in the manufacture by making various inquiries, as to the number of hands employed by the company, the progress made by them, &c.

THE Local Government Board have held an inquiry at Birkenhead into the application of the Corporation for sanction to borrow 35,000*l.* for electric lighting, sewerage purposes, and the erection and equipment of a fire-station.

PLANS have been prepared for a road bridge over the river Severn at Newnham. The river is nearly 600 yards wide

at the place which is regarded as the most favourable for throwing the bridge across, and a high-level bridge is recommended. The estimated cost is 25,000*l.*

AT Enfield on Wednesday next Messrs. E. & H. Lumley will put up for sale by auction the valuable freehold building estate known as Gough Park, at the junction of Forty Hill with Clay Hill, comprising fifty-nine plots of grandly-timbered building land, forming most admirable sites for large or small residences. The existing old-fashioned residence, with stabling, &c., will also be offered. It is within an easy distance of London, and is served by two railways, the distance from town by road not exceeding ten miles, in a part of the county of Middlesex which is remarkable for the beauty of the scenery.

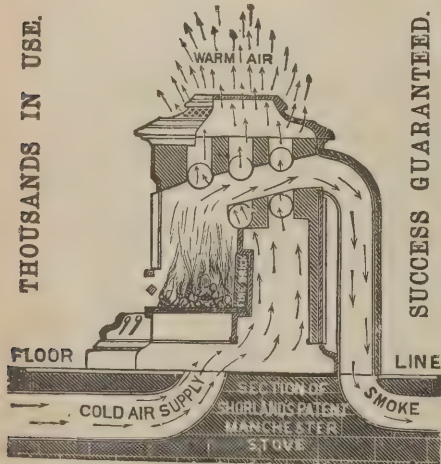
THE CARPENTERS' COMPANY.

THE annual examination for shop and outdoor foremen, &c. was held at Carpenters' Hall on June 20 to 23. Among the examiners were, as usual, such well known men as Mr. F. C. Penrose, P.R.I.B.A., Professor Banister Fletcher, F.R.I.B.A., Professor T. Roger Smith, F.R.I.B.A., &c. Of the candidates who presented themselves the following passed. We have arranged them in order of merit:—

Bishop, T. E.	First-class Certificate and Silver Medal.
Pyle, B. T.	" " " " " " " " " " " "
Denny, C.	" " " " " " " " " " " "
Allibone, George	" " " " " " " " " " " "
Schlund, W. T.	" " " " " " " " " " " "
Catchlove, Geo.	" " " " " " " " " " " "
Gower, J. W.	" " " " " " " " " " " "
Evans, T. D.	" " " " " " " " " " " "
Carter, J. E.	" " " " " " " " " " " "
Boorman, J.	" " " " " " " " " " " "
Hunt, H. T.	" " " " " " " " " " " "
Williams, W.	" " " " " " " " " " " "
Ellis, George	" " " " " " " " " " " "
Struthers, Alex.	" " " " " " " " " " " "
Wyatt, Wm.	" " " " " " " " " " " "
Grant, W. R.	Second-class Certificate.
Henderson, Geo.	" " " " " " " " " " " "
Grubb, H. C.	" " " " " " " " " " " "
Colby, R. W.	" " " " " " " " " " " "
Gosby, Jno.	" " " " " " " " " " " "

SHORLAND'S PATENT COMBINATION OPEN FIRE-PLACE MANCHESTER STOVE

Made in various Designs and Sizes, with Tiled or Iron Sides, Single or Double Fronted, and with Ascending or Descending Smoke Flue.

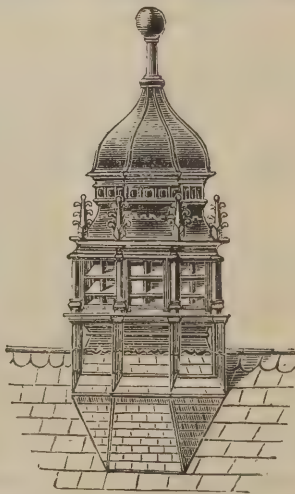


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Shorland's Inlet and Outlet Ventilators in every Design.

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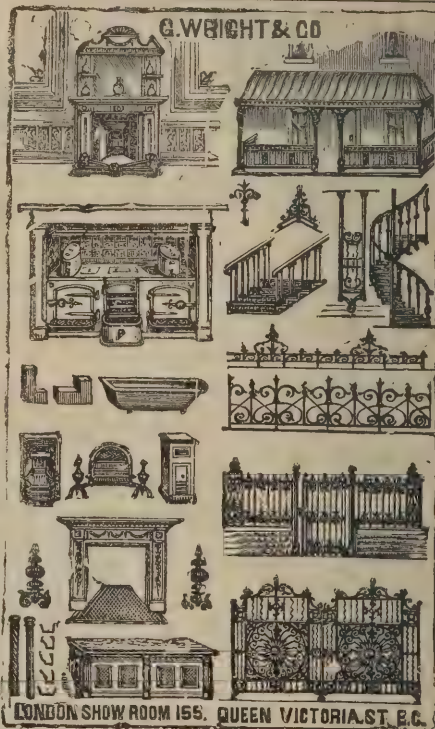


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With Lifting Fire.

WORKS, ROTHEBHAM. Estab. 1854.

NOTES ON NOVELTIES.

Macadam Road Scarifiers.—Great interest was evinced in the trial of two road scarifiers at West Hampstead, and the result proved eminently satisfactory in regard to one of the machines, Rutty's improved patent macadam scarifier. This machine, invented and patented by Mr. George G. Rutty, contractor, of Bromley-by-Bow, was the first machine used for breaking up macadamised roads preparatory to recoating with broken granite. It was used first on the Victoria Embankment eight years ago, and has been used there every year since for this class of work. The trial at West Hampstead took place in the top portion of Iverson Road, under the supervision of Mr. A. Rutty, and the machine, which comprises no fewer than six patents, justified its reputation in every way. It is very simple in construction: the body is of cast-iron, hollow in the centre, and has three cast-steel teeth at each end. These teeth are a foot long and 2 inches in width at the top, tapering to a point. The centre of the body rests on an axle with a small wheel at either end, and there is a wheel at the front and back of the machine. By means of screws at the back and front the ends of the machine may be raised or lowered whilst still travelling, and as the machine is made to slide on the axle, it can be made to work close up to the kerb or channel next the footpath. The machine will work both forwards and backwards, only the teeth at one end being used at a time, and thus there is no necessity for turning the machine round. The depth of material to be broken can be regulated by means of the screws, from 1 to 3 inches as required, and by the same means plug-holes, man-holes or paved crossings can be avoided while the machine is in motion. The weight of the machine is about two tons. It can be drawn by a six-horse power traction engine or by a steam-roller, and the fact that an ordinary steam-roller can be used for drawing it makes it a convenient and economical machine for local authorities.

NEATH PUBLIC WORKS.

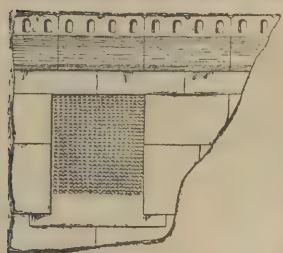
MAJOR-GENERAL C. PHIPPS CAREY, R.E., held an inquiry on behalf of the Local Government Board on the 22nd inst. respecting an application of the Neath (South Wales) Rural Sanitary Authority for sanction to the borrowing of sums of 13,000*l.* for sewerage works at Skewen, and 1,300*l.* and 600*l.* for works of water supply for the contributory places of Blaen-hond-dau and Resolven respectively.

The details of the schemes were explained by the engineer to the Board, Mr. W. E. Clason Thomas, Assoc.M.Inst.C.E. The former scheme comprises between 7 and 8 miles of sewers, including 1,080 feet of tank-sewer of a sectional area of 36 square feet (capacity 243,000 gallons), with a tidal outfall into the river Neath. The system of back drainage has been adopted throughout, and by the arrangement of certain man-holes the ventilation will be entirely cut off between one portion of the district and another, each district having its separate supply of fresh-air inlets and extraction shafts, thereby preventing the gases accumulating and ascending to the higher portions of the district. Automatic flushing is provided at all dead ends by utilising the various sources of supply from springs and streams and the provision of a 19,000-gallon flushing reservoir at the Mooretown end of the district. The outfall sewer is 18 inches in diameter and passes under the Tennant Canal, where, owing to the restrictions laid down by the owner of the canal, an inverted syphon has had to be provided; then it takes a straight course to the Clydach river, over which it is carried for 100 feet in an iron box girder on iron piers, thence through the marsh until it reaches the tank storage sewer.

The Sanitary Authority are empowered under the Neath Corporation Water Bill (which has just passed the House of Lords) to purchase that portion of the existing waterworks which lies in their district, and which has a separate supply from that of the Corporation. The loan of 7,000*l.* required for the purpose is sanctioned by the Bill, and it is now proposed to enlarge the sources of supply, build a new service reservoir and lay several new mains in the district, plans for which will shortly be laid before the Board.

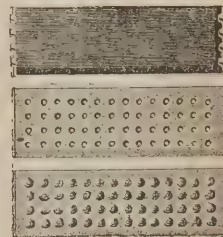
THE PROGRESS OF ELECTRIC LIGHTING.

THE position now reached by the electric light as one of the necessities of our everyday life, and the increasing tendency of the public to take it for granted that they can always have it ready at hand, makes one somewhat apt to forget the time when electric supply was unheard of. But the public memory is proverbially short. The general use of electric light has been a plant of slow growth, but it would not have been so slow if electrical engineers had taken more pains to use their art to the best effect. We have recently had an opportunity of seeing some of the results achieved by the Electrical Instal-



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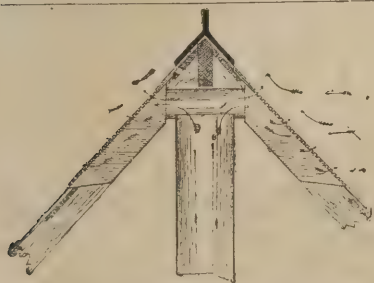
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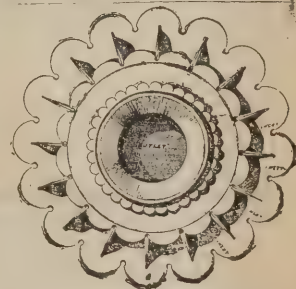
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lation Company, Ltd., of 66 and 64 Victoria Street, S.W., in overcoming the prejudices of those who associate electric light with strange devices in brass and copper, leaf-work lilies growing upside down from the ceiling, from which hung cut-glass things called shades, from whose dazzling rays there was no escape. People went to their clubs and returned vowing that they would never have electric light in their homes. But now, in view of the taste displayed by the Electric Installation Company in the work they have carried out both in town and country, there should be no excuse for these barbarities. If there still exists any idea that electric light is dangerous, it is probably due to the disgraceful way in which the wiring of buildings is too often scamped, on the principle of out of sight out of mind.

Still, so far as the internal arrangements of a house are concerned, this is the most important point of all, and we are therefore well pleased to learn that the Electric Installation Company's method of wiring is being greatly approved of by leading architects, who recognise its many advantages, viz. elimination of joints, accessibility for alterations and additions, ease with which faults can be detected and located, moderate cost.

The company have recently completed a most successful installation for Lord Stratheden & Campbell at his seat in Roxburghshire, the dynamo being driven by water-power, and supplying not only the house and stables and a battery of Epstein cells as a reserve, but also providing the current if required during the day for an electric motor erected at the home farm. Among other business the company has secured in the City we may notice the large block of offices in Great Trinity Lane, for the lighting of which they are responsible. The Electric Installation Company are constantly bringing out fresh novelties, and one of the most ingenious things we have lately seen is their table-connector, by means of which candelabra fitted for electric light may be placed on any dinner table without any unsightly wires showing. Any number desired can be used and placed in any position. Moreover, the candelabra can still be used for candles if required.

Their "Safety Wall Plug" (patent) for connecting movable lamps to the source of the current, is the most compact yet devised, and will commend itself to both architects and electrical engineers.

In spite of the depression in trade, of which so much is heard, we note that the Electrical Installation Company have opened a branch in Edinburgh at No. 30 St. Andrew Square, and have appointed Mr. J. H. Mackail to be their district superintending engineer for that city.

THE LONDON COUNTY COUNCIL AND NON-UNION LABOUR.

A CORRESPONDENT of the *Times* writes:—In the *Times* of May 2 reference was made to the fact that a vote was about to be taken among the members of unions in the Building Trades' Federation to say whether or not a general strike of the workmen employed by the London County Council should be declared with a view to secure the dismissal of a certain foreman at the Belvedere Road works who had refused to join the union. The threatened strike has not come off, however, the foreman in question having since joined the union rather than attempt to try his strength with the forces that would otherwise have been brought to bear against him. This particular incident, therefore, may be regarded as closed. All the same, it is regarded as significant of a state of things in connection with London County Council work, against which a vigorous protest is now being made. It is declared to have become "a recognised thing" in the building and kindred trades that there is no hope of a man being employed on a London County Council "job" unless he can produce his federation ticket. Such ticket is regarded as the *sine qua non* of employment. The question of the moment, therefore, reduces itself to this—Should not a non-union worker have as good a chance of obtaining work under a public body like the County Council, supported as it is out of the rates, as a member of a union? The reply made by the defenders of the County Council is, in effect, that the critics of that body are wrong in their facts. The onus of proof, therefore, falls on those who make the protest, and they so far accept the responsibility that they have formed a deputation which will wait upon the Works Committee of the London County Council and put before them some of the proofs on which the allegations are based. The deputation is limited by the committee to ten persons, but no fewer than seven of these will be men prepared to state positively that they themselves have applied for work under the County Council, and have been refused employment because they were non-unionists. It is declared that, if necessary, innumerable other instances could be adduced. Each of these seven men has made a written statement in advance, signed by himself in the presence of witnesses, and setting forth his own experiences. One of the most striking of the statements is that of a general foreman (a person capable of taking full charge of the work of

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construction when the architect has prepared his plans), who is now acting in that capacity in the erection of an important vestry hall. His story is worth recording in his own words:—

"In March 1894 I applied with my character to the London County Council to see if they could give me a job as general foreman. I was told to apply to the office of the Works Department, Belvedere Road. I asked to see the manager, and went into a waiting-room. When the manager came to me I asked if he had a vacancy for a general foreman, and told him where I had been working. After some conversation I was asked by the manager whether I belonged to the Building Trades' Federation and whether I agreed with their principles, and, on answering each of these questions in the negative, the manager told me that there was no work for me, and that it was no use applying for work. I am certain that the manager meant me to understand that he could not give me employment unless I belonged to the federation and had their ticket."

One of the other men, a painter, says:—

"In September 1893 I applied at the County Council work going on at Westminster Bridge, and in November 1893 at the work going on at Bishopsgate fire station, for a job as a painter. I went to Westminster Bridge with a non-union painter. The foreman inquired if we were union men, and, on our both answering 'No,' he said he could not take us on, as they employed none but union men there. About a quarter of an hour afterwards he took on two union men for the job. At the fire brigade station I applied with a union man who had a federation ticket. The foreman asked me if I did not belong to the union, and said they employed none but union men there. The union man was taken on and I was refused; but an hour afterwards I saw a union man taken on, so I knew that if I had had a federation ticket I should have had the job."

The other statements are to practically the same effect.

A deputation from the National Free Labour Association waited upon the works committee of the London County Council on Monday afternoon for the purpose of submitting a statement with reference to the alleged refusal of the Council, or the Council's officials, to employ workmen who could not show the ticket of the Building Trades' Federation. The deputation, which consisted entirely of representatives of the building trade in its various branches, was introduced by Mr. F. J. Roger, hon. treasurer, and Mr. W. Collison, secretary of the Free Labour Association. Mr. Henry Ward, chairman of the works committee, presided, and there was a large

attendance of members. The case for the association as put before the committee was that at the present time an overwhelming majority of the workmen employed by the Council are members of trade unions, and that those non-union men who are in the service of the Council owe their position to the influence of members specially exerted on their behalf. Specific instances of work being refused to men who could not show the ticket of the Building Trades' Federation were given, the instances being in regard to the works at Spring Gardens, the painting of Westminster Bridge, Bishopsgate Street Fire Brigade Station and Victoria Park. Twelve men were in attendance to give evidence on these points, and seven of them were examined individually by the committee. The examination was conducted in private, but it is stated that the committee accepted the men's statements, and a promise was given that the question would be thoroughly investigated. Mr. John Burns, M.P., Mr. Crooks and other labour members of the Council were present, but none of them it is said put any questions to the witnesses. It is stated that until the committee's report is made no action will be taken by the Free Labour Association, but should the report be unfavourable measures will at once be adopted to place the case for free labour before the public.

ELECTRIC LIGHTING IN EDINBURGH.

THE foundation-stone of the Central Electric Station was laid on Monday. About twenty-three miles of mains are to be laid and the Corporation are to light four miles of streets. The cost of the installation is to be about 100,000*l*. A site of about an acre in area was secured for the central station in Torphichen Street, where it has a siding to the Caledonian Railway. This station will have a frontage to Torphichen Street of 200 feet and to Dewar Place of about 150 feet. It is built to accommodate about seventeen boilers—equivalent to 6,000 horse-power—and about a score of engines and dynamos; but until the demand requires it, it is not proposed to put down more than six boilers and six engines and dynamos, which will be sufficient to give an equivalent of 40,000 lamps of eight candle-power. In the hands of the committee the scheme has grown considerably beyond its original dimensions. Mainly in connection with the lighting of streets the committee have gone a good way beyond the compulsory area, and this part of the scheme will, it is believed, be on a larger scale than prevails in



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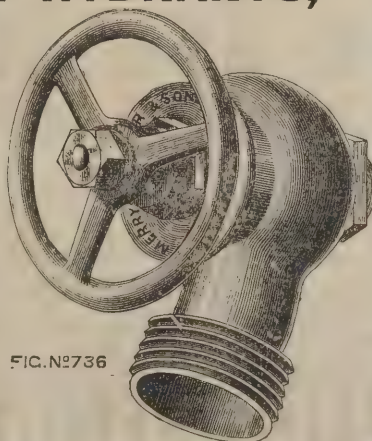
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GOLD MEDAL, Inventions Exhibition, 1885.

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any city in the kingdom except London and perhaps London-derry.

Professor Kennedy, of London, as consulting engineer, in April of last year submitted a scheme for lighting the compulsory area on the low tension three-wire system, with provision for lighting the suburbs with a high tension system. The preliminary estimate for carrying out this scheme was 85,000*l.*—this sum not including the cost of the station and site—and the income at the end of three years was put down at 17,100*l.*, when it was estimated that about 40,000 lamps would have been wired.

In the evening, at the Albert Hall, Professor Kennedy delivered a popular lecture on the subject of the "Electric Light in Edinburgh." He explained generally the means of generating electrical energy, and making it available for use, and emphasised the fact that the dynamo did not make electricity; it only delivered it under pressure. In explaining the difference between the glow lamp and the arc lamp, and showing how the latter was the cheaper where very large quantities of light were wanted, he mentioned that four miles of the public streets would be lit with arc lamps, having an effective illuminating power of 600 to 700 candles each. In Princes Street the candle-power would be stronger, and he ventured to think that when Princes Street was lit with electricity it would be as fine a street under that light as it was in the daylight. Having explained the method of sending the electricity throughout the city by means of feeding and distributing mains, and having described the different sorts of mains which would be used, the means taken to insulate them, and to lay them in the street, he went on to discuss the subject of the cost of the electric light. In Edinburgh the highest charge for current would be 6*d* per Board of Trade unit. The lamps would cost 1*s.* 3*d.* each. In these circumstances the cost would be about a seventh of a penny per hour for an eight candle-power lamp, and a farthing per hour for a sixteen candle-power lamp. Each glow-lamp would last five hundred or six hundred hours, giving effective light, so that in a private house, with gas at the present price, electric light ought not to cost more than gas. This estimate, however, did not apply if the house was so wired that two or three lights had to be turned on when only one was required, or if the switches were so placed that it was inconvenient to get at them in the dark, or if the mistress of the house thought the wire in the lamp was a detestable thing, and insisted on covering the lamp with an ornament which

absorbed an effective part of the light. The lecture was illustrated with lantern slides, and three of these slides represented views taken from photographs of the ceremony of laying the foundation-stone of the central station in the afternoon.

MANCHESTER AND LEEDS.

THE annual meeting of the Incorporated Association of Municipal and County Engineers was held at Westminster, under the presidency of Mr. A. M. Fowler, C.E., who congratulated the association on having attained its majority, and reviewed the advances that has been made in engineering and sanitary science during the past twenty-one years. Among the things yet to be carried out, however, he advocated the provision of free public open-air baths; the heating of blocks of cottage property by hot air from a central station, and a supply of hot water by similar means; public shelters in different localities for the poor and desolate, &c. He referred at length to the various works which had been carried out in Manchester and Leeds, with both of which towns he had been officially connected; and, speaking of the improvements which had taken place in connection with locomotion, said that he remembered travelling up by four-horse coach with the mails from Leeds to London, the distance of 186 miles taking 26 hours, whereas the journey was now accomplished in four hours. He pointed out how, in Manchester, Leeds and Salford, street improvements had been carried out without additional cost to the ratepayers, and especially referred to the Boar Lane improvements at Leeds, where the price of vacant land adjoining, which was taken by the Corporation, was raised from 3*l.* per square yard to 6*l.*, so that the town was not called upon for any increase in the rates. The acquirement of parks and open spaces (amongst others the Roundhay Park at Leeds) was dealt with, and a description given of the gigantic undertakings of Manchester, in relation to the provision of hydraulic power, electric light, and the water supply. The Thirlmere scheme, he said, would this year be completed, when from the two sources of Thirlmere and Longendale the city would have a supply of 45 million gallons per day. The water was of the highest possible standard, containing only 7 deg. of hardness, which was 15 deg. softer than that of London water. The saving in soap and labour to Manchester, he calculated, amounted to upwards of 300,000*l.* per year, and

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if London had such a supply their saving would be upwards of 2,250,000l. per year. Speaking of the Ship Canal, he said that this year Manchester had had the crown of success added to its achievements by having a highway opened out to the sea. As they were aware, this had become of late years a municipal work, as the Corporation of Manchester now represented more than half the board of directors, and had provided the large sum of 5,000,000l. of the company's capital of 8,000,000l. to enable the undertaking to be completed. That appeared to be an enormous sum for a municipality to advance, and was unprecedented; but when they reflected upon the many great schemes and undertakings which the city of Manchester had entered into they might all be said to be unprecedented. Although the canal itself at present was not in that flourishing condition expected of it from the prospectus, &c., issued on its promotion, yet as a municipal undertaking it had no doubt already paid the inhabitants of Manchester, inasmuch as the reduction of the railway freights between Liverpool and Manchester since its commencement of the shipping at present carried on (although limited) was a great boon to the city. Among other matters referred to was the treatment of sewage, in regard to which he said Leeds had spent 10,000l. in experimenting and on structural works before laying down the permanent plant for the treatment of about 10 million gallons of sewage daily before entering the river.

HAZELAND'S WOOD-PLANING MACHINE.

ON Thursday, the 21st inst., a petition for a prolongation of the letters patent, dated July 10, 1880, No. 2848, granted to Samuel Searle Hazeland, of Par, Cornwall, machinist, came on for hearing before the Judicial Committee of the Privy Council (present Lord Watson, Lord Hobhouse, Sir Richard Couch and the Right Hon. George Denman). The invention relates to the use of a simple and inexpensive machine for planing all kinds of woodwork boards for confectionery and cigar-boxes, floor boards, stair steps and packing cases of every description.

In his petition, Mr. Hazeland alleged that the machine had been applied with very great and most marked practical success in London, Lancashire, Yorkshire, Leicestershire and a large number of places in England and other parts of the United Kingdom, that he had given much time and labour to and expended very considerable sums of money in experiments upon

and in perfecting his said invention, to do which he had had to give up his venetian blind manufactory, that he had granted licenses to make his invention at a royalty, among others to Messrs. W. B. Haigh & Co., Limited, of Oldham; Mr. George Lines, of Bootle; and Messrs. Thomas Robinson & Son, Limited, of Rochdale, and, that notwithstanding the sums he had received from his licenses, he had been insufficiently remunerated, and that he had, in fact, made a loss.

From the accounts produced, it appeared that the patentee had received during the fourteen years royalties amounting to 976l. 15s. 2d., the sale prices of the machines (ranging from 10l. to 80l.) amounting to 7,816l. 2s. 5d., and that, adding his expenditure and the value of his personal services to the patent fees of 189l. 13s., a considerable loss had been incurred.

Mr. H. B. Hans Hamilton (instructed by Mr. E. Heys Jones, of 5 John Street, Bedford Row, W.C.) appeared for the petitioner, and Mr. Sutton (with him Sir John Rigby, Q.C., Attorney-General) appeared for the Crown.

Mr. Hans Hamilton, after shortly reciting the facts of the case, called Mr. Hazeland, who bore out counsel's opening and the statements in the petition and accounts, and he also explained to the committee from a model the merit of his invention—a simple roller with a thick rubber tyre placed immediately over the planing knife, acting both as a feeder and presser in place of the numerous rollers and cogs in other planing machines, these rollers and cogs hitherto having been used only for pressing the wood upon the knife, the feeding being effected by separate action.

Mr. David House, engineer to Messrs. A. Bridgman & Co., Limited, box and packing-case makers, City Road Bridge, E.C., spoke to the novelty and ingenuity of the invention. He said that if the machine could be fed quickly about 1,400 feet of wood could be planed per minute, but owing to the time taken in feeding the machine, they could only turn out about 700 feet per minute. They had five machines in use, and did not know anything to equal them. The machine in constant use lasted a great number of years.

Their lordships, Mr. Sutton not objecting, said they were satisfied with the accounts, and would not require evidence thereon. Other evidence was called, and it was shown that the machine had been a great boon to the trade, and there was nothing at present so cheap and so good in the market.

Their lordships decided to advise her Majesty to grant a prolongation of Mr. Hazeland's letters patent for a further term of seven years.

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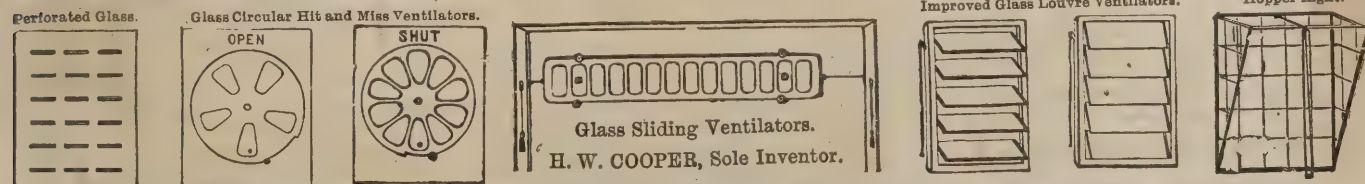
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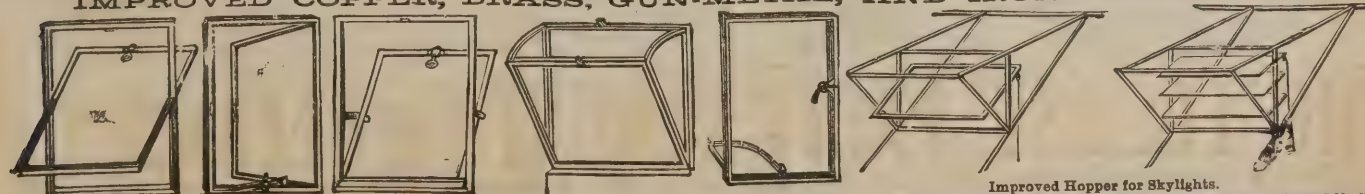


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THE LATE JOHN REID.

THE death is announced of the Lord Dean of Glasgow Guild Court, which occurred suddenly. Mr. Reid was a native of Auchterarder, Perthshire, and is styled by the *Glasgow Herald* as one of their foremost captains of industry. As in the case of many men who have risen to like positions, he was the architect of his own ample fortune. He was born in the parish of Kilmaurs in September 1822, and such education as he received was got at the village school. At the outset of his career he was engaged as a blacksmith's assistant, under more than one employer. Ultimately he went to Greenock, beginning with Messrs. Scott, Sinclair & Co., and being employed afterwards by Messrs. Caird & Co. as an engineer. He had a natural taste for drawing and some knowledge of the art, and an injury to one of his eyes led to his transference from the practical department to the drawing-office. There he displayed such ability and aptitude that he rose to the position of chief draughtsman in 1850. When in his thirtieth year he came to be manager at Hyde Park Locomotive Works, which then occupied their original position in Anderston. Here he remained for some years, extending his knowledge and experience. Subsequently he removed to Manchester, having received a similar appointment as manager of the locomotive Works of Messrs. Sharp, Stewart & Co. In 1863 the late Mr. Henry Dubs retired from the management of the Hyde Park Works to start the Glasgow Locomotive Works at Polmadie. Mr. Montgomerie Neilson had some time previously entered into correspondence with his former manager, with the result that Mr. Reid returned to Glasgow as managing partner of the firm of Messrs. Neilson & Co. During his absence the Hyde Park Works had been transferred to Springburn—the actual date of removal was the year 1860. Mr. Neilson was at the time in failing health, and the burden of the work fell upon Mr. Reid. But it was wholly congenial, he threw himself into it with his whole heart, and the business began rapidly to extend. As an indication of the progress which has been made, it may be mentioned that in 1863 about 1,000 men were employed, and the number of engines turned out was seventy-eight annually; lately the number of the hands had increased to about 2,600, and the output to 200 locomotives a year, Hyde Park being the largest

locomotive establishment in private hands in the United Kingdom. Mr. Reid's original agreement with Mr. Montgomerie Neilson was for a period of ten years. At its expiry a new arrangement was made, giving Mr. Reid the option of purchase. This power he exercised in the year 1876, and from that date until last year, when the membership of the firm was extended by the assumption of his four sons, Messrs. Hugh, John, Andrew, and Walter, he was the sole proprietor of the work.

The life of Mr. Reid may be said to have been co-extensive with the locomotive industry, and to this fact in some measure was due the supreme position he attained. But he had native qualities which made for success. He was a man of sterling integrity, iron will, indomitable perseverance, and of the most methodical business habits. For many years after he came to Hyde Park as managing partner he was in the works as punctually on the stroke of six o'clock as any of his men, while his work-day often extended till late into the night. Many men had a greater amount of scientific and theoretical knowledge, but Mr. Reid had the faculty of seeing instinctively the means of obtaining a desired result. His instructions were given with promptness and decision, and he seldom made a mistake, though in all cases he imperatively insisted on his orders being obeyed. He had great experience, firmness and tact in the management of men, and there has rarely been a dispute in the Hyde Park Works. But he was no believer in modern ideas, nor was his view a late growth. He was wont to tell of an experience in his early life, when a fellow-workman found fault with him for doing too much work, declaring that he would soon find himself out of a job. The reply of the youth was that he meant to do his work as well as he could, to do as much as he could, and that he would brook interference on the part of no man. The incident was characteristic of the man throughout his long and useful life.

Absorbed in the management of his own establishment and in the extension and perfecting of all its details, Mr. Reid was for many years unable to give much of his time or attention to public affairs, but his interests were largely bound up with the district of Springburn, and in the year 1877 he was induced to enter the Council as member for the Third Ward. He remained in office for the full term of three years, and was a most useful member. He took little part in the public discussions, but in committee he gave valuable advice in practical matters, readily placing at the service of the community his wide and varied experience. Last November Mr. Reid again

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returned to the Town Council. On this occasion he was sent as Lord Dean of Guild by the Merchants' House, of which body he had long been a member. He was for a period of years a member of the Springburn School Board, and for a time held office as chairman. In all matters connected with Springburn he took a lively interest, and recently he made a gift of a bandstand for the new public park.

Mr. Reid was a generous patron of the fine arts and filled the position of president of the Fine Art Institute. He was president of the Institution of Engineers and Shipbuilders, a member of the Institution of Civil Engineers, chairman of the Tramway Company, and a Justice of the Peace for the counties of Lanark and Perth.

DELAYS IN BUILDING PARTY WALLS.

IN the Court of Appeal on the 22nd inst. an important case—*Jolliffe v. Woodhouse*—relating to party walls was heard before the Lords Justices. The plaintiff was tenant from year to year of No. 17 Coronet Street, Hoxton, where he carried on business as a fish salesman. The defendant was the owner of the adjoining house, No. 19. Towards the end of 1891, or the beginning of 1892, the defendant pulled down his house with the intention of rebuilding it, and it was found that the party wall between Nos. 19 and 17 was not strong enough to support the new building. The defendant accordingly served notice upon the plaintiff under the Metropolitan Building Act, 1855, of his intention to pull down the party wall. The defendant began to pull down the wall on February 16, 1892. Thereupon the plaintiff on February 17 issued the writ in this action for an injunction to restrain the defendant, his architect, builders, surveyors or servants from interfering with the party wall or in any way hindering the plaintiff from carrying on his business or rendering his house uninhabitable. The rebuilding was completed in August 1892. The trial of the action was commenced before Mr. Justice Bruce in April 1893, the defence being that the acts complained of were done under the powers of the Metropolitan Building Act, 1855. The plaintiff then sought to make out that the defendant had exceeded his powers under the statute, and an order was made by consent directing the action to stand over to enable the plaintiff to give particulars of alleged acts of excess of statute. The plaintiff duly delivered particulars under this order, from which it appeared that the main complaint was that the defendant had allowed an unreasonable time to elapse before the completion of the re-

building. In May 1894 the action was tried before Mr. Justice Grantham and a common jury, and leave was obtained by the plaintiff to amend his statement of claim so as to raise the issue of delay in the rebuilding. The jury found a verdict for the plaintiff, damages 40*l.*, and judgment was entered accordingly. The defendant now applied for a new trial on the ground of misdirection. The points which he mainly relied on were two—first, that the judge ought not to have allowed the claim to be amended, inasmuch as the cause of action had arisen since the writ, and secondly, that inasmuch as the defendant had provided a competent architect and builder he was not responsible to the plaintiff for the delay caused by their negligence.

The Court, without calling upon counsel for the plaintiff, refused the application.

Lord Justice Lindley said that it was contended that the judge had no power to amend so as to give to the plaintiff in this action any relief in respect of injuries sustained after the issue of the writ. But that point was clearly waived by the defendant by the consent order, and even apart from that order his lordship was not satisfied that the judge had no power to allow the amendment under the circumstances. Then it was said that the defendant was not liable for the injury caused by the delay in rebuilding, because he had employed a proper architect and a proper builder, and that they were responsible for the negligence, if any, which gave rise to the delay. That contention was founded on a mistake. A person who sought to knock down a party wall for the purpose of rebuilding it had a right to do so both at common law and by statute, but it was his duty to rebuild it with reasonable despatch. Here the plaintiff had a cause of action against the defendant for the breach of that duty, and it was no answer to say that the defendant had delegated that duty to his builder or architect. A man could not delegate a duty, and the class of cases in which an employer who had engaged a competent contractor was held not liable for the negligence of the contractor had no application. The defendant might employ a contractor if he chose, but that did not enable him to get rid of the responsibility for the breach of the duty which he owed to the plaintiff. The application should be refused.

Lord Justice Lopes concurred. *Cubitt v. Porter* decided that an action would not lie against an adjoining owner for pulling down a party wall for the purpose of rebuilding it; but he was bound to do so without causing any unnecessary inconvenience to his neighbour, and without unreasonable delay.

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That also appeared from section 85, sub-section 3, of the Metropolitan Building Act, 1855, which provided that no building owner should exercise any right thereby given "in such manner or at such time as to cause unnecessary inconvenience to the adjoining owner." An absolute duty was thrown upon the person knocking down the wall to do so within a reasonable time and in a reasonable manner, and he could not delegate that duty to a contractor.

Lord Justice Davey agreed. The defendant's argument could only be supported by confusing two classes of cases. Where a man owed a duty to his neighbour he could not free himself of that duty by delegating it to another person. Where, on the other hand, a man employed a contractor to do work which, if properly and skilfully done, did not involve any interference with his neighbour's rights, but an injury had been caused by the negligence of the contractor, then it might be that the employer would not be liable if he employed a competent contractor. Here the defendant had a statutory and common-law licence to take down this party wall, subject to the duty of using reasonable despatch, and when he employed a contractor to do the work he took upon himself the responsibility of seeing that that duty was adequately performed.

NATIONAL REGISTRATION OF PLUMBERS.

LIST OF REGISTERED PLUMBERS.

Provincial Masters.

BAKER, E., Corporation Road, Middlesbrough.
BAKER, T. N., Corporation Road, Middlesbrough.
BREARCLIFFE, T., Low Street, Horsforth, Leeds.
GOODALL, F., Green Bower, Marsden, near Huddersfield.
JAGGER, W. H., Elizabeth Street, Elland, Yorks.
SALTHOUSE, W., 21 Church Street, Preston.

Provincial Journeymen.

BOWMAN, A. T., 10 Selbourne Place, Roxburgh Road, Leeds.
DUTHIE, P., 224 High Street, Perth.
FORDHAM, F., 6 Berners Street, Wakefield.
GOLDIE, D., 1 Thomson Street, Dundee.
GRANT, T., 21 Green Street, Cardiff.
HARRISON, T., 227 Station Road, Bamber Bridge, near Preston.
HASSAL, A., 4 Allerton Road, Higher Tranmere, Birkenhead.
HENDERSON, A., 31 Charles Street, Dundee.
HORSFALL, J. T., Allhallowgate, Ripon.

KENNEDY, D. A., 36 Walton Street, Dundee.
KINNEAR, T. L., 4 Park Terrace, Dundee.
LANGSTAFF, G. R., 27 Albert Terrace, Skirbeck, Boston, Lincs.
MARSHALL, C., 2 Wilkinson Street, Burmantofts, Leeds.
MILLER, H., 49 Harold Road, Southsea.
STORY, J., 25 Oatland Place, Leeds.
STORY, J., 27A Chapeltown Road, Leeds.
WEBSTER, J., Fox Street, Carnoustie, N.B.
YOUNG, A., 15 Blackness Street, Dundee.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

11275. Franz Scherrer, for "Safety window in shape of a ladder."
11318. Karl Emil Wolf, for "Improvements in movable screens for window openings and other purposes."
11345. Patrick Mooney, for "An improvement in tops for gully and other traps."
11356. John Pitt Bayly, for "Improvements in spring door catches."
11394. Henry Alfred Dunmore, for "Improvements in door locks."
11461. Jesse Kirkman, for "Improvements in waste-water closets."
11486. Frederick Trevillion Williamson, for "Improvements in window fasteners."
11487. George Thomas Martin, for "A simple and improved fastening for windows and doors."
11510. Eli Ambler, for "Improvements in, or relating to water-closet syphons."
11537. John William Maddison, for "A method of fastening window blinds and the like to rollers."

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